

PROJECT SPECIFICATION MANUAL

Construction Documents

2024 FACILITY IMPROVEMENTS

- Bid Package A – Bus Barn
- Bid Package B – Pedestrian Bridge Repairs

Central Lyon Community School District
Rock Rapids, IA

FEH DESIGN Project No. 2022018.07

October 2023



FEH DESIGN

ARCHITECTURE / ENGINEERING / INTERIORS

SIoux CITY, IA
712 252 3889

DES MOINES, IA
515 288 2000

DUBUQUE, IA
563 583 4900

DELAFIELD, WI
262 968 2055

**2024 FACILITY IMPROVEMENTS
CENTRAL LYON COMMUNITY SCHOOL DISTRICT
ROCK RAPIDS, IOWA
ARCHITECT'S PROJECT NO. 2022018.07
BID DATE: THURSDAY, November 16, 2023 @ 11:00 a.m. (Local Time)**

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NOTICE OF BID LETTING

1.01 THE OWNER (HEREINAFTER REFERRED TO AS Owner):

A. Central Lyon Community School District
1010 South Greene Street, Rock Rapids, Iowa 51246

B. Project Location:
Bid Package A – Bus Barn
“Hairpin” Site
Rock Rapids, Iowa 51246

Bid Package B – Pedestrian Bridge Repairs
Central Lyon School
1010 South Greene Street
Rock Rapids, Iowa 51246

1.02 AND THE ARCHITECT (HEREINAFTER REFERRED TO AS Architect):

A. FEH DESIGN
1201 4th Street, Suite 201
Sioux City, Iowa 51101
Architect's File No. 2022018.02

1.03 BIDS DUE

- A. Date: Thursday, November 16, 2023
- B. Time: 11:00 am local time
- C. Location: Central Lyon CSD Board Room @ 1010 South Greene Street, Rock Rapids, IA 51246.

1.04 NOTICE IS HEREBY GIVEN:

- A. Sealed bids for the **2024 FACILITY IMPROVEMENTS** will be received by the **Central Lyon Community School District**.
- B. Bids will be publicly opened by the District and publicly read by the District or designee, on said date and will be acted upon by the Owner at such later time and place as may then be fixed. Award of the Contract shall be to the lowest responsive, responsible bidder determined on the basis of a combination of the Base Bid and selected Alternates. Neither the District nor its agents will assume liability for the inability of the bidder to submit a bid in a timely manner. Bids received after the deadline will be rejected. Bidders bear full and complete responsibility for the timely submission of such bid. Time of receipt shall be the time recorded and determined by the District or designee.

1.05 POTENTIAL BIDDERS

Project: **2024 FACILITY IMPROVEMENTS**

- A. **Project Scope:** The Work of the Project is defined by the Contract Documents and consists of the following bid packages:

1. Bid Package A – Bus Barn including alternates and unit prices
2. Bid Package B – Pedestrian Bridge Repairs

Bids will be received for the following:

General Contract including Demolition, Architectural, Structural, Mechanical, Plumbing, Electrical, and Civil Construction Work.

Bids will be publicly opened by the Owner and publicly read by the Architect on said date and will be acted upon by the Owner at such later time and place as may then be fixed. Award of the Contract shall be to the lowest responsive, responsible bidder determined on the basis of a combination of the Base Bid and selected Alternates. Neither the District nor its agents will assume liability for the inability of the bidder to submit a bid in a timely manner. Bids received after the deadline will be rejected. Bidders bear full and complete responsibility for the timely submission of such bid. Time of receipt shall be the time recorded and determined by the Board Secretary.

All bids shall be in accordance with Contract Documents prepared by **FEH DESIGN** which Contract Documents are made a part of this Notice by reference thereto.

Prime Contractors and Sub-Contractors can obtain one (1) set of printed bidding documents from the Architect for a plan deposit of \$100.00 per set. Deposit will be refunded to bidders upon return of their complete set of Bidding Documents, including any Addenda, properly bound and in good condition to **FEH DESIGN** within 14 calendar days after opening of bids. Cash deposits will not be accepted. MBI plan deposit cards are also an acceptable method of deposit for documents. When shipping / postage is required, there will be a \$20 non-refundable fee for each set of Bid Documents shipped. **PLANS WILL BE AVAILABLE STARTING on Wednesday, October 18, 2023 but not before.**

Bidding Documents are on file at the Architect's Office, 1201 4th Street, Suite 201, Sioux City, Iowa 51101; and at the following Plan Centers:

DOCUMENT AVAILABILITY

Bidding Documents may be examined at the following places:

Beeline and Blue – Des Moines, IA www.beelineplanroom.com
CMD Group (formerly Reed Construction Data) – Norcross, GA
Dodge Data & Analytics – Arlington, TX
Lincoln Builders Bureau – Lincoln, NE
Master Builders – Des Moines, IA
Minnesota Builders Exchange – Minneapolis, MN
Norfolk Builders Exchange – Norfolk, NE
Omaha Builders Exchange – Omaha, NE
Plains Builders Exchange – Sioux Falls, SD
Sioux City Construction League – Sioux City, IA
Sioux Falls Builders Exchange – Sioux Falls, SD

Some plan centers may include the documents on their respective electronic sites, including iSQFT. Check with the individual plan centers to verify.

BIDDING REQUIREMENTS

Each Bid shall be made on a form furnished by the Architect, and must be accompanied by a certified check or cashier's check drawn on an Iowa bank, or Bid Bond to be executed by corporation authorized to contract as a surety in the State of Iowa, in the amount equal to five percent (5%) of the amount of the Bid, made payable to the **Central Lyon Community School District, Rock Rapids, IA** and may be cashed by the District as liquidated damages in the event that the successful bidder fails to enter into a Contract and file a bond satisfactory to the District assuring the faithful fulfillment of the Contract and maintenance of said improvements as required by the law, the provisions of this Notice and Contract Documents within (10) days after acceptance of the lowest responsive, responsible bid. All bids shall be sealed and plainly marked. Any alteration of the Bid Form may be cause for rejection of the bid.

State Sales Tax: This project is tax exempt. **Do Not** include State Sales Tax in any calculation of Bid totals. Contractor will be provided with Iowa sales tax exemption number for this project.

BASIS OF BIDS

The successful Bidder will be required to furnish a Performance Bond and Labor and Material Payment Bond in an amount equal to one hundred percent (100%) of the Contract Sum, issued by a responsible Surety approved by the District and shall guarantee the faithful performance of the Contract and terms and conditions therein contained and the maintenance of said improvements pursuant to the provisions of the Contract Document. Bid Security shall be made payable to **Central Lyon Community School District, Rock Rapids, IA**.

Bid Security of two lowest Bidders will be retained until a contract has been awarded and executed, but no longer than **30** days. No Bidder may withdraw their bid within **30** days after opening of bids.

The **Central Lyon Community School District**, reserves the right to reject any or all bids, re-advertise for new bids, and to waive informalities that may be in the best interest of the **Central Lyon Community School District**.

Payment will be made by the **Central Lyon Community School District** from cash-on-hand or from such sources as may be legally available.

Monthly estimates will be paid to the Contractor as the work progresses in amounts equal to **ninety-five percent (95%)** of the Contract value of the work completed during the preceding calendar month, including the actual cost (exclusive of overhead or profit to the Contractor) of materials and equipment of

a permanent nature to be incorporated in the work and delivered to and stored at the job site. Such monthly payments shall in no way be construed as an act of acceptance for any part of the work, partially or totally completed. Final payment of the **five percent (5%)** due each Contractor will be made upon final acceptance of the work under the respective Contract by the District, and after receipt of satisfactory evidence that all claims pertaining to such Contract have been paid in full as provided in the Contract Document for said work.

The work under the Contract shall be commenced on or before a date to be specified in the Contract or written Notice to Proceed of the Owner, and shall achieve Substantial Completion by the following dates for the following phases:

1. Bid Package A – Bus Barn:
 - a. Start: Around April 15, 2024
 - b. Substantial Completion: October 1, 2024
2. Bid Package B – Pedestrian Bridge Repairs:
 - a. Start: Around May 6, 2024
 - b. Substantial Completion: August 16, 2024

All bids will be governed by applicable provisions in the Iowa Code and District Policies.

Pre-Bid Conference: A Pre-Bid Conference for interested bidders will be held Thursday, November 2, 2023 at 10:00 am local time at 1010 South Greene Street, Rock Rapids, IA 51246 in the Board Room. All prospective bidders are encouraged to be present at this pre-bid conference. A walk through tour will follow.

Each Bidder shall visit the site to familiarize themselves with conditions under which they will operate. All interested parties in attendance at the pre-bid meeting will sign the attendance form. There are no provisions for any additional dates for site visits.

END OF SECTION

SECTION 00 11 14

NOTICE OF HEARING

HEARING: Wednesday, December 13, 2023

PROJECT: 2024 Facility Improvements including a new Bus Barn and
Pedestrian Bridge Repairs
Central Lyon Community School District
Rock Rapids, IA 51246

NOTICE OF PUBLIC HEARING: On December 13, 2023 at the District Board Room in the Central Lyon School, 1010 South Greene Street, IA 51246, at 5:00 pm the Central Lyon Community School District shall hold a public hearing on the proposed plans, specifications, proposed form of contract and the estimated cost of said improvements. At said hearing any interested person may appear and file objections to the proposed plans, specifications, form of contract, or estimated cost of said improvements.

Published upon order of the **Central Lyon Community School District, Rock Rapids, IA.**

END OF SECTION

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AIA[®] Document A701[™] – 2018

Instructions to Bidders

for the following Project:
(Name, location, and detailed description)

2024 Facility Improvements
Rock Rapids, Iowa

THE OWNER:
(Name, legal status, address, and other information)

Central Lyon Community School District
1010 S. Greene Street
Rock Rapids, IA 51246

THE ARCHITECT:
(Name, legal status, address, and other information)

FEH DESIGN
1201 4th Street, Suite 201
Sioux City, IA 51101

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- 2 BIDDER'S REPRESENTATIONS**
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- 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS**

ADDITIONS AND DELETIONS:
The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

FEDERAL, STATE, AND LOCAL LAWS MAY IMPOSE REQUIREMENTS ON PUBLIC PROCUREMENT CONTRACTS. CONSULT LOCAL AUTHORITIES OR AN ATTORNEY TO VERIFY REQUIREMENTS APPLICABLE TO THIS PROCUREMENT BEFORE COMPLETING THIS FORM.

It is intended that AIA Document G612[™]-2017, Owner's Instructions to the Architect, Parts A and B will be completed prior to using this document.

ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the Proposed Contract Documents. The Bidding Requirements consist of the advertisement or invitation to bid, Instructions to Bidders, supplementary instructions to bidders, the bid form, and any other bidding forms. The Proposed Contract Documents consist of the unexecuted form of Agreement between the Owner and Contractor and that Agreement's Exhibits, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, all Addenda, and all other documents enumerated in Article 8 of these Instructions.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, or in other Proposed Contract Documents apply to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect, which, by additions, deletions, clarifications, or corrections, modify or interpret the Bidding Documents.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents, to which Work may be added or deleted by sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from, or that does not change, the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment, or labor for a portion of the Work.

ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 By submitting a Bid, the Bidder represents that:

- .1 the Bidder has read and understands the Bidding Documents;
- .2 the Bidder understands how the Bidding Documents relate to other portions of the Project, if any, being bid concurrently or presently under construction;
- .3 the Bid complies with the Bidding Documents;
- .4 the Bidder has visited the site, become familiar with local conditions under which the Work is to be performed, and has correlated the Bidder's observations with the requirements of the Proposed Contract Documents;
- .5 the Bid is based upon the materials, equipment, and systems required by the Bidding Documents without exception; and
- .6 the Bidder has read and understands the provisions for liquidated damages, if any, set forth in the form of Agreement between the Owner and Contractor.

ARTICLE 3 BIDDING DOCUMENTS

§ 3.1 Distribution

§ 3.1.1 Bidders shall obtain complete Bidding Documents, as indicated below, from the issuing office designated in the advertisement or invitation to bid, for the deposit sum, if any, stated therein.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall obtain Bidding Documents.)

§ 3.1.2 Any required deposit shall be refunded to Bidders who submit a bona fide Bid and return the paper Bidding Documents in good condition within ten days after receipt of Bids. The cost to replace missing or damaged paper documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the paper Bidding Documents, and the Bidder's deposit will be refunded.

§ 3.1.3 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the advertisement or invitation to bid, or in supplementary instructions to bidders.

§ 3.1.4 Bidders shall use complete Bidding Documents in preparing Bids. Neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete Bidding Documents.

§ 3.1.5 The Bidding Documents will be available for the sole purpose of obtaining Bids on the Work. No license or grant of use is conferred by distribution of the Bidding Documents.

§ 3.2 Modification or Interpretation of Bidding Documents

§ 3.2.1 The Bidder shall carefully study the Bidding Documents, shall examine the site and local conditions, and shall notify the Architect of errors, inconsistencies, or ambiguities discovered and request clarification or interpretation pursuant to Section 3.2.2.

§ 3.2.2 Requests for clarification or interpretation of the Bidding Documents shall be submitted by the Bidder in writing and shall be received by the Architect at least seven days prior to the date for receipt of Bids. *(Indicate how, such as by email, website, host site/platform, paper copy, or other method Bidders shall submit requests for clarification and interpretation.)*

§ 3.2.3 Modifications and interpretations of the Bidding Documents shall be made by Addendum. Modifications and interpretations of the Bidding Documents made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3 Substitutions

§ 3.3.1 The materials, products, and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance, and quality to be met by any proposed substitution.

§ 3.3.2 Substitution Process

§ 3.3.2.1 Written requests for substitutions shall be received by the Architect at least ten days prior to the date for receipt of Bids. Requests shall be submitted in the same manner as that established for submitting clarifications and interpretations in Section 3.2.2.

§ 3.3.2.2 Bidders shall submit substitution requests on a Substitution Request Form if one is provided in the Bidding Documents.

§ 3.3.2.3 If a Substitution Request Form is not provided, requests shall include (1) the name of the material or equipment specified in the Bidding Documents; (2) the reason for the requested substitution; (3) a complete description of the proposed substitution including the name of the material or equipment proposed as the substitute, performance and test data, and relevant drawings; and (4) any other information necessary for an evaluation. The request shall include a statement setting forth changes in other materials, equipment, or other portions of the Work, including changes in the work of other contracts or the impact on any Project Certifications (such as LEED), that will result from incorporation of the proposed substitution.

§ 3.3.3 The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.4 If the Architect approves a proposed substitution prior to receipt of Bids, such approval shall be set forth in an Addendum. Approvals made in any other manner shall not be binding, and Bidders shall not rely upon them.

§ 3.3.5 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

§ 3.4 Addenda

§ 3.4.1 Addenda will be transmitted to Bidders known by the issuing office to have received complete Bidding Documents.

(Indicate how, such as by email, website, host site/platform, paper copy, or other method Addenda will be transmitted.)

§ 3.4.2 Addenda will be available where Bidding Documents are on file.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids, except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Prior to submitting a Bid, each Bidder shall ascertain that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

ARTICLE 4 BIDDING PROCEDURES

§ 4.1 Preparation of Bids

§ 4.1.1 Bids shall be submitted on the forms included with or identified in the Bidding Documents.

§ 4.1.2 All blanks on the bid form shall be legibly executed. Paper bid forms shall be executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and numbers, unless noted otherwise on the bid form. In case of discrepancy, the amount entered in words shall govern.

§ 4.1.4 Edits to entries made on paper bid forms must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change" or as required by the bid form.

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall neither make additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name and legal status of the Bidder. As part of the documentation submitted with the Bid, the Bidder shall provide evidence of its legal authority to perform the Work in the jurisdiction where the Project is located. Each copy of the Bid shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further name the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached, certifying the agent's authority to bind the Bidder.

§ 4.1.8 A Bidder shall incur all costs associated with the preparation of its Bid.

§ 4.2 Bid Security

§ 4.2.1 Each Bid shall be accompanied by the following bid security:

(Insert the form and amount of bid security.)

§ 4.2.2 The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and shall, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount

of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. In the event the Owner fails to comply with Section 6.2, the amount of the bid security shall not be forfeited to the Owner.

§ 4.2.3 If a surety bond is required as bid security, it shall be written on AIA Document A310™, Bid Bond, unless otherwise provided in the Bidding Documents. The attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of an acceptable power of attorney. The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 4.2.4 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until (a) the Contract has been executed and bonds, if required, have been furnished; (b) the specified time has elapsed so that Bids may be withdrawn; or (c) all Bids have been rejected. However, if no Contract has been awarded or a Bidder has not been notified of the acceptance of its Bid, a Bidder may, beginning days after the opening of Bids, withdraw its Bid and request the return of its bid security.

§ 4.3 Submission of Bids

§ 4.3.1 A Bidder shall submit its Bid as indicated below:

(Indicate how, such as by website, host site/platform, paper copy, or other method Bidders shall submit their Bid.)

§ 4.3.2 Paper copies of the Bid, the bid security, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address, and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.3 Bids shall be submitted by the date and time and at the place indicated in the invitation to bid. Bids submitted after the date and time for receipt of Bids, or at an incorrect place, will not be accepted.

§ 4.3.4 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.5 A Bid submitted by any method other than as provided in this Section 4.3 will not be accepted.

§ 4.4 Modification or Withdrawal of Bid

§ 4.4.1 Prior to the date and time designated for receipt of Bids, a Bidder may submit a new Bid to replace a Bid previously submitted, or withdraw its Bid entirely, by notice to the party designated to receive the Bids. Such notice shall be received and duly recorded by the receiving party on or before the date and time set for receipt of Bids. The receiving party shall verify that replaced or withdrawn Bids are removed from the other submitted Bids and not considered. Notice of submission of a replacement Bid or withdrawal of a Bid shall be worded so as not to reveal the amount of the original Bid.

§ 4.4.2 Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids in the same format as that established in Section 4.3, provided they fully conform with these Instructions to Bidders. Bid security shall be in an amount sufficient for the Bid as resubmitted.

§ 4.4.3 After the date and time designated for receipt of Bids, a Bidder who discovers that it made a clerical error in its Bid shall notify the Architect of such error within two days, or pursuant to a timeframe specified by the law of the jurisdiction where the Project is located, requesting withdrawal of its Bid. Upon providing evidence of such error to the reasonable satisfaction of the Architect, the Bid shall be withdrawn and not resubmitted. If a Bid is withdrawn pursuant to this Section 4.4.3, the bid security will be attended to as follows:

(State the terms and conditions, such as Bid rank, for returning or retaining the bid security.)

ARTICLE 5 CONSIDERATION OF BIDS

§ 5.1 Opening of Bids

If stipulated in an advertisement or invitation to bid, or when otherwise required by law, Bids properly identified and received within the specified time limits will be publicly opened and read aloud. A summary of the Bids may be made available to Bidders.

§ 5.2 Rejection of Bids

Unless otherwise prohibited by law, the Owner shall have the right to reject any or all Bids.

§ 5.3 Acceptance of Bid (Award)

§ 5.3.1 It is the intent of the Owner to award a Contract to the lowest responsive and responsible Bidder, provided the Bid has been submitted in accordance with the requirements of the Bidding Documents. Unless otherwise prohibited by law, the Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's best interests.

§ 5.3.2 Unless otherwise prohibited by law, the Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the lowest responsive and responsible Bidder on the basis of the sum of the Base Bid and Alternates accepted.

ARTICLE 6 POST-BID INFORMATION

§ 6.1 Contractor's Qualification Statement

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request and within the timeframe specified by the Architect, a properly executed AIA Document A305™, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted for this Bid.

§ 6.2 Owner's Financial Capability

A Bidder to whom award of a Contract is under consideration may request in writing, fourteen days prior to the expiration of the time for withdrawal of Bids, that the Owner furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. The Owner shall then furnish such reasonable evidence to the Bidder no later than seven days prior to the expiration of the time for withdrawal of Bids. Unless such reasonable evidence is furnished within the allotted time, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

§ 6.3 Submittals

§ 6.3.1 After notification of selection for the award of the Contract, the Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, submit in writing to the Owner through the Architect:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the principal products and systems proposed for the Work and the manufacturers and suppliers of each; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

§ 6.3.2 The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

§ 6.3.3 Prior to the execution of the Contract, the Architect will notify the Bidder if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, withdraw the Bid or submit an acceptable substitute person or entity. The Bidder may also submit any required adjustment in the Base Bid or Alternate Bid to account for the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

§ 6.3.4 Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND

§ 7.1 Bond Requirements

§ 7.1.1 If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder.

§ 7.1.2 If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

§ 7.1.3 The Bidder shall provide surety bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 7.1.4 Unless otherwise indicated below, the Penal Sum of the Payment and Performance Bonds shall be the amount of the Contract Sum.

(If Payment or Performance Bonds are to be in an amount other than 100% of the Contract Sum, indicate the dollar amount or percentage of the Contract Sum.)

§ 7.2 Time of Delivery and Form of Bonds

§ 7.2.1 The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to commence sooner in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

§ 7.2.2 Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond.

§ 7.2.3 The bonds shall be dated on or after the date of the Contract.

§ 7.2.4 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix to the bond a certified and current copy of the power of attorney.

ARTICLE 8 ENUMERATION OF THE PROPOSED CONTRACT DOCUMENTS

§ 8.1 Copies of the proposed Contract Documents have been made available to the Bidder and consist of the following documents:

- .1 AIA Document A101™–2017, Standard Form of Agreement Between Owner and Contractor, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .2 AIA Document A101™–2017, Exhibit A, Insurance and Bonds, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .3 AIA Document A201™–2017, General Conditions of the Contract for Construction, unless otherwise stated below.
(Insert the complete AIA Document number, including year, and Document title.)
- .4 AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, dated as indicated below:
(Insert the date of the E203-2013.)

.5 Drawings

Number	Title	Date
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.6 Specifications

Section	Title	Date	Pages
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.7 Addenda:

Number	Date	Pages
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.8 Other Exhibits:

(Check all boxes that apply and include appropriate information identifying the exhibit where required.)

AIA Document E204™–2017, Sustainable Projects Exhibit, dated as indicated below:
(Insert the date of the E204-2017.)

The Sustainability Plan:

Title	Date	Pages
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Supplementary and other Conditions of the Contract:

Document	Title	Date	Pages
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.9 Other documents listed below:

(List here any additional documents that are intended to form part of the Proposed Contract Documents.)

SECTION 00 22 13

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

1.01 INSTRUCTIONS TO BIDDERS

- A. The "Instructions to Bidders" AIA Document A701, 2018 Edition, Articles 1 through 8 inclusive, is a part of this Contract, a copy is included in this Project Manual.

1.02 SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

- A. The following supplements modify or add to the AIA Instructions to Bidders. Where any part of the Instructions to Bidders is modified, the unaltered provisions of that part shall remain in effect.

1.03 MODIFIED INSTRUCTIONS

- A. Article 1: Definitions
 - 1. Modify paragraph 1.1 to include the Notice of Hearing and Letting as part of the Bidding Documents.
- B. Article 2: Bidder's Representations
 - 1. Add the following clause 2.1.3.1
 - a. 2.1.3.1 The Bidder has investigated all the required fees, permits, and regulatory requirements of authorities having jurisdiction and has properly included in the submitted Bid, the cost of such fees, permits and requirements not otherwise indicated as provided by Owner.
 - 2. Add the following subparagraph 2.1.5
 - a. 2.1.5 The Bidder is a properly licensed Contractor according to the laws and regulations of "Iowa's Contractor Law Registration and Bonding". <<http://www.iowaworkforce.org/labor/contractor.htm>> and meets qualifications indicated in the Procurement and Contracting Documents.
 - 3. Add the following subparagraph 2.1.6
 - a. 2.1.6 The Bidder has incorporated into the Bid adequate sums for work performed by installers whose qualifications meet those indicated in the Procurement and Contracting Documents.
 - 4. Add the following subparagraph 2.1.7
 - a. In accordance with Department of Labor Rules located at 875 IAC 156.2, the Owner requests a statement from each bidder regarding the bidder's resident status. This statement shall be on the Bidder Status Form designated by the labor commissioner and available online at: <http://www.iowaworkforce.org/labor/bidderstatusform.pdf>. This statement shall require each bidder to certify whether the bidder is a resident bidder or non-resident bidder. In the case of a resident bidder, the statement shall require the resident bidder to identify each office at which the resident bidder has conducted business in the state during the previous three years and the dates on which the resident bidder conducted business at each office. In the case of a non-resident bidder, the statement shall require the non-resident bidder to identify the non-resident bidder's home state or foreign country as reported to

the Iowa Secretary of State, to identify each preference offered by the nonresident bidder's home state or foreign country, and to certify that, except as set forth on the form, there are no other preferences offered by the non-resident bidder's home state or foreign country. The statement shall include such other additional information as requested by the labor commissioner form. The statement must be signed by an authorized representative of the bidder. A fully completed statement shall be deemed to be incorporated by reference into all project bid specifications and contract documents with any bidder on the project. Failure by any bidder to provide a completed statement with its bid may result in the Owner rejecting the bid as non-responsive.

C. Article 3: Bidding Documents

1. 3.2 Interpretation or Correction of Bidding Documents - Add the following subparagraphs:

a. 3.2.4 in the case of errors, inconsistencies, or ambiguities in the Bidding documents not interpreted or clarified by addendum or discovered too late for an addendum, the following applies:

- 1) The better quality or greater quantity of Work shall be provided.
- 2) To the best of their ability, the Bidders shall determine the proper methods or materials to fulfill the design intent of the Bidding Documents and include cost of providing such methods in Bid.
- 3) Failure to request clarification will not waive the responsibility of comprehension of the documents and performance of the Work in accordance with the intent of the documents. Signing the Agreement will be considered as thorough comprehension of intent of the Bidding Documents.

b. 3.2.5 The following consultants to the Architect were involved or responsible for the indicated phases or divisions of the Work, and are listed herein as a convenience to the Bidders.

- 1) Structural Engineering:
FEH DESIGN
951 Main Street
Dubuque, IA 52001
(563) 583-4900
Attention: Bryan Blair, PE
- 2) Mechanical Engineering:
EDA, Inc
385 12th Street NE
Sioux Center, Iowa 51250
712-722-0228
Attention: Dale Woudstra, PE
- 3) Electrical Engineering:
EDA, Inc
385 12th Street NE
Sioux Center, Iowa 51250
712-722-0228
Attention: Andy Landman, PE

4) Civil Engineering:
DGR Engineering
1302 S Union Street
Rock Rapids, Iowa 51246
712-472-2531
Attention: Gary Kurth, PE

2. Add the following paragraph:

a. 3.5 Contracts

1) 3.5.1 The Owner invites the following Bids: Single Prime Contract

D. Article 4: Bidding Procedures

1. 4.1

a. Delete the first sentence in Subparagraph 4.1.6.

b. Delete the word "additional" in the second sentence of 4.1.6.

2. 4.2 Bid Security

a. Add the following to Subparagraph 4.2.1:

1) Each Bid shall be accompanied by a certified check, cashier's check, certified share draft or Bid Bond in the amount equal to five percent (5%) of the amount of the Bid as a guarantee that the Bidder will furnish a one hundred per-cent (100%) Performance Bond and a Labor and Material Payment Bond, and will enter into a Contract with the Owner in accordance with the terms of the Bid within (7) calendar days after receipt of the notice of award. Bid security shall be made payable to the **Central Lyon Community School District**. Bidders shall use AIA Document A310 - Bid Bond, or another corporate form approvable to the **Central Lyon Community School District**.

b. Add the following to Subparagraph 4.2.2:

1) As soon as the Bids have been checked and compared, the Owner may, at its discretion, return the bid security accompanying those Bids that in Owner's judgment would not be considered in making the award. When award is made, the Bid security of the two (2) lowest responsive, responsible Bidders will be retained until the Contract and Bonds have been executed and the Contract approved by the Owner. Should the award be delayed more than thirty (30) days after opening of the Bids, all Bid security will be returned, unless such delay is from cause beyond the control of the Owner.

3. 4.3 Submission of Bids

a. Add the following to Subparagraph 4.3.1:

1) Submit Bid and Bid security in separate opaque, sealed envelopes with: (1) Project name, (2) name of Bidder, and (3) Bid Package proposed. label one envelope "Bid Form" and the other envelope "Bid Security."

- b. ADDRESS BIDS TO:
 - 1) Board of Education
 - 2) Central LyonCommunity School District
 - 3) District Office
 - 4) 1010 South Greene Street
 - 5) Rock Rapids, IA 51246
 - 6) **BIDS DUE: Thursday, 11/16/2023 at 11:00 am local time.**
 - c. MAILED BIDS: Sent to address indicated above.
 - d. HAND CARRIED BIDS: Deliver to the **District Board Room** at the address indicated above.
 - e. Bids will be publicly opened and read immediately at the designated time by the Board of Education.
 - f. Add the following Subparagraph 4.3.6
 - 1) Bidders are hereby given notice to check carefully the accuracy and arithmetic of their bids before submission. Errors in bids may result in rejection of that bid and award to the next low bidder and disposition of bid security is at the discretion of the Owner.
4. 4.4 Modification or Withdrawal of Bid
- a. Add the following to Subparagraph 4.4.1:
 - 1) No Bid may be withdrawn within thirty (30) days from the scheduled date for receipt of Bids.
- E. Article 5: Consideration of Bids
- 1. Delete the words “Advertisement or Invitation to Bid” and replace with “Notice of Hearing and Letting.”
 - 2. Acceptance of Bid (Award)
 - a. Amend the first sentence to read as follows: “It is the intent of the Owner to award a Contract to the lowest responsive, responsible Bidder determined on the basis of a combination of the base bid and selected alternates provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available.”
- F. Article 6: Post Bid Information
- 1. 6.3 Submittals
 - a. 6.3.1 Delete the words "as soon as practicable after" (in the first line) and substitute the words "within seven (7) days of".
- G. Article 7: Performance Bond and Labor and Material Payment Bond
- 1. Modify Subparagraph 7.1.1 as follows:
 - a. 7.1.1 The Contractor shall furnish in duplicate a Performance Bond, Maintenance Bond and Labor and Material Payment Bond, each in the amount of one hundred percent (100%) of the Contract Sum, issued by a responsible surety approved by the Owner. Bidders shall use bid bond forms included in the specifications or of a corporate form approvable to the **Central Lyon Community School District**. Performance Bond and Payment Bond AIA Document A312.

- b. Modify the first sentence of Subparagraph 7.2.1 as follows:
 - 7.2.1 The Bidder shall deliver the required bonds to the Owner, together with the executed Owner-Contractor Agreements, not later than seven (7) days following the date of the Contract award.

1.04 ADDITIONAL PROVISIONS

A. Add the following provisions, as indicated:

1. Article 9: Additional Instructions

a. 9.1 Preparation of Bids

- 1) 9.1.1 Bids shall be submitted on the prescribed form and shall be subject to all requirements of the Contract Documents and these INSTRUCTION TO BIDDERS. The Bidder must bid all of the Alternates, if any are listed. Special care shall be exercised in the preparation of Bids. All Bids must be regular in every respect and no interlineations, excisions, or special conditions shall be made or included in the bid form of the Bidder.
- 2) 9.1.2 Each Bid shall furnish the full business name, business address, and treasury member of the person, firm, or corporation submitting the Bid. The signature of the person signing a Bid shall be the usual signature of that person, and the name of each person signing a Bid shall be typed or printed below the signature.
- 3) 9.1.3 A Bid by an Individual shall furnish their full name and complete address.
- 4) 9.1.4 A bid by a Partnership shall furnish the full name and complete home address of each partner. A Bid by a partnership shall be signed with the partnership's name by one of the members of the partnership or by an authorized representative, followed by the signature and designation of the person signing the Bid.
- 5) 9.1.5 A Bid by a Corporation shall be signed with the legal name of the corporation, followed by the State of Incorporation and by the signature of the president, secretary, or other person authorized to bind it in the matter. When requested by the Owner, satisfactory evidence of authority of the officer signing on behalf of a corporation shall be furnished. Attached to a Bid by a corporation shall be a list containing the name and complete home address of each principal officer of the corporation.
- 6) 9.1.6 The Owner may consider as irregular any Bid on which there is an alteration of or departure from the Bid Form hereto attached and at its option may reject the same.
- 7) 9.1.7 Bidders shall carefully examine the Bidding Documents and construction site to obtain firsthand knowledge of existing conditions. The Contractors will not be given extra payments for conditions which can be determined by examining the site and Bidding Documents.

b. 9.2 Errors In Bid

- 1) 9.2.1 Bidders or their authorized agents are expected to examine all Contract Documents, Drawings, Specifications, circulars, schedules, and other instructions pertaining to the Work. Failure to do so will be at the Bidder's own risk and he cannot secure relief on the plea of error in the Bid.

c. 9.3 Disqualification of Bidder

- 1) 9.3.1 Any one or more of the following causes may be considered as sufficient for the disqualification of a Bidder and the rejection of his Bid:
 - 2) 9.3.1.1 More than one bid for the same work from an individual, firm, partnership, or corporation under the same or different names.
 - 3) 9.3.1.2 Evidence of collusion among Bidders. (Participants in such collusion may receive no recognition as Bidders for any future work.)
 - 4) 9.3.1.3 Lack of responsibility as evidenced by poor workmanship and progress of past work.
 - 5) 9.3.1.4 Incomplete work that in the judgment of the Owner might hinder or prevent the prompt completion of additional work if awarded.
 - 6) 9.3.1.5 For being in arrears on existing contracts, in litigation with the Owner, or having defaulted on a previous contract.
 - 7) 9.3.1.6 The attention of Bidders is directed to Section 553.23 Code of IOWA, regarding unlawful combinations in making public contracts.

d. 9.4 Approval of Contract

- 1) 9.4.1 No contract is binding upon the Owner until it has been executed by and approved by the Owner and delivered to the Contractor and the Contract Bond has been filed with the **Central Lyon Community School District** and approved.

e. 9.5 Award

- 1) 9.5.1 The Owner will select the Bid that it deems most reasonable and in its best interest in terms of cost, quality, appearance, performance of the Contractor and the Contractor's proximity to the site and his ability to service the Project after it has been completed.
- 2) 9.5.2 The Contract will be awarded based on the above qualifications to the lowest responsive, responsible Bidder for the lowest combination of Base Bid and selected Alternates.
- 3) 9.5.3 The **Central Lyon Community School District, Rock Rapids, IA**, reserves the right to reject any and/or all Bids and waive any or all informalities, as authorized by law, in connection therewith and shall award the Bid based on the best interests of the Owner.

f. 9.6 Contract Time

- 1) 9.6.1 Bidder agrees to commence Work as soon as possible on or before 10 days after receiving a written "Notice to Proceed" from the Owner, and to substantially complete the Project as soon as possible. The dates of substantial completion shall be so stated by the Construction Bidder in the space provided on the BID FORM and in compliance with project schedule.

g. Sales and Use Tax

- 1) 9.7 The Bidder shall not include in the bid State of Iowa and Local Option Sales and Use Tax for building materials that will be incorporated into real property for this project. Each Bid Package Contractor shall provide a list of subcontractors and sub-subcontractors with their Federal Identification Number to the Owner, The Owner will issue exemption certificates to contractors, subcontractors, sub-subcontractors and suppliers in order to eliminate tax from the construction materials following award of contracts. If material is purchased outside the state of Iowa and the other State requires that the contractors, subcontractors, and sub-subcontractors and suppliers pay sales tax they are recommended to include this price in their Bid unless they are able to obtain a sales tax refund from said State.

h. Law and Regulations

- 1) 9.8 The Bidder's attention is directed to the fact that all applicable state laws, municipal ordinances and the rules and regulations of all authorities having jurisdiction over construction of the Contract are applicable the same as though herein written out in full.

END OF SECTION

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SECTION 00 31 00

AVAILABLE PROJECT INFORMATION

PART 1 GENERAL

1.01 EXISTING CONDITIONS

- A. Certain information relating to existing surface and subsurface conditions and structures is available to bidders but will not be part of the Contract Documents, as follows:
- B. Grading Plan: The grading plan is available in AutoCAD (.dwg) format from DGR Engineering (Civil Engineer). To receive the file, contact DGR Engineering:
 - 1. Attn: Gary Kurth, P.E.
 - 2. Phone: (712) 472-2531
 - 3. Email: gary.kurth@dgr.com
- C. Geotechnical Report: Entitled Geotechnical Engineering Report CTS Project No. G7020, dated May 23, 2023.
 - 1. This report identifies properties of below grade conditions and offers recommendations for design. It has been prepared primarily for use by the design team.
 - 2. This report, by its nature, cannot reveal all conditions that exist on the site. Should subsurface conditions be found to vary substantially from this report, changes in the design and construction will be made, with resulting credits or expenditures to the Contract Sum accruing to Owner.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

END OF SECTION

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Certified Testing Services, Inc.

GEOTECHNICAL ENGINEERING REPORT

**Bus Barn Alternate Site
Central Lyon CSD
Rock Rapids, Iowa**

Prepared For:
Central Lyon Community School District
Rock Rapids, Iowa

CTS Project No. G7020



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.

Signature:  5-23-2023

Name: Matthew R. Dailey, P.E. (date)

License Number: 19700

My license renewal date is December 31, 2023.

Pages or sheets covered by this seal:

This bound report contains 27 pages, including this page.
CTS File Number G7020



Certified Testing Services, Inc.

419 W. 6th Street • P.O. Box 1193 • Sioux City, Iowa 51102 • Phone (712) 252-5132

May 23, 2023

Attn: Mr. Brent Jorth
Superintendent of Schools
Central Lyon Community School District
1010 S. Greene Street
Rock Rapids, Iowa 51246

Re: Geotechnical Engineering Report
Bus Barn Alternate Site
Central Lyon CSD
Rock Rapids, Iowa
CTS Job No. G7020

Dear Mr. Jorth:

Certified Testing Services, Inc. is pleased to transmit our Geotechnical Engineering Report for the referenced project. This report includes the results of field and laboratory testing, and recommendations for project site preparation and foundation design.

We appreciate the opportunity to perform this Geotechnical Study and look forward to continued participation during the design and construction phases of this project. If you have any questions pertaining to this report or if we may be of further service, please contact our office.

Respectfully submitted,
CERTIFIED TESTING SERVICES, INC.


James A. Bertsch, P.E. IA 12121
Senior Geotechnical Engineer


Matthew R. Dailey, P.E. IA 19700
Geotechnical Department Manager

JAB/MRD/jb

cc: FEH Design

GEOTECHNICAL ENGINEERING REPORT

**BUS BARN ALTERNATE SITE
CENTRAL LYON CSD
ROCK RAPIDS, IOWA**

CTS PROJECT NO. G7020

PREPARED FOR

**ATTN: MR BRENT JORTH
SUPERINTENDENT OF SCHOOLS
CENTRAL LYON COMMUNITY SCHOOL DISTRICT
1010 S. GREENE STREET
ROCK RAPIDS, IOWA 51246**

MAY 23, 2023

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PROJECT INFORMATION

Project Authorization

Certified Testing Services, Inc. has completed a subsurface exploration for the Bus Barn Alternate Site project for the Central Lyon Community School District in Rock Rapids, Iowa. Mr. Brent Jorth, Superintendent of the Central Lyon CSD, authorized our work by signing our proposal on May 4, 2023. Our work was performed in accordance with CTS Proposal 6391 that was dated April 28, 2023.

Project Description

Mr. Matt Basye, Vice President/Architect for FEH Design, provided preliminary information in an email on April 28, 2023. The email included an RFP with an aerial that was titled, "Soil Boring Location Plan" and aerial titled, "Exhibit". It is also understood that there will be 18 feet wide paved aprons on the east and west sides of the building with gravel surfacing extending out to the street. The following information is our understanding of the project:

Bus Barn

- Single-story structure with slab-on-grade
- Plan dimensions of approximately 93 feet by 104 feet
- Steel or wood framed construction is assumed
- Report is based on maximum column loads of 50 kips and maximum wall loads on the order of 4 KLF
- Report is also based on less than 2 feet of cut/fill to bring building area to grade

The geotechnical recommendations presented in this report are based on the available project information, structure locations and the subsurface materials described in this report. If the noted information is incorrect, please inform CTS in writing so that we may amend the recommendations presented in this report, if appropriate. CTS will not be responsible for the implementation of its recommendations when it is not notified of changes in the project.

Purpose and Scope of Services

The purpose of this study was to explore the subsurface conditions at the sites to prepare recommendations for foundation systems for the proposed construction. Our scope of services included performing two soil test borings to depths of 15 feet below the existing grade in the bus barn building area and two soil test borings in the pavement areas. The scope of work also included select laboratory testing, and preparation of this geotechnical report. This report briefly outlines the testing procedures, presents available project information, describes the site and subsurface conditions, and presents recommendations regarding the following:

- Suitability of site for the construction of the proposed project
- Site preparation and grading procedures for project

- Foundation types, depths, allowable bearing capacities and estimate for potential settlement
- Pavement subgrade preparation and thickness recommendations
- Comments regarding factors that will impact construction and performance of the proposed construction.

The scope of services did not include an environmental assessment of the site.

SITE AND SUBSURFACE CONDITIONS

Site Location and Description

The site for the proposed bus barn is located on the east side of N. Union Street south of the intersection of N. Union Street and 140th Street in Rock Rapids, Iowa. The site was bordered by an existing building to the north, ditch and Hark Blvd to the east, agricultural field to the south and N. Union Street to the west. At the time of drilling, the site surface consisted of tall vegetation. The site was relatively level with approximately 1.5 feet of elevation change between Building Borings B2 and B3. The site was firm at the time of our site visit and the drill rig did not experience difficulty moving around the site.

Subsurface Conditions

The site subsurface conditions were explored with two soil test borings sampled to depths of 15 feet below the existing grade in the bus barn area and two soil test borings sampled to depths of 5 feet below the existing ground surface in the pavement areas. The boring locations were chosen by FEH Design personnel. The surface elevations at the borings were determined in the field using conventional leveling techniques and are for general reference only. The center of Hark Blvd east of the utility box located southeast of Boring B4 was used as a benchmark and an elevation of 100.0 feet was assigned to the benchmark. CTS personnel located the borings in the field using a handheld GPS device. The following table presents the approximate GPS coordinates for the boring locations and the approximate locations of the borings are also presented on the “Boring Location Plan” included in the Appendix, which is a modified copy of drawing titled, “Soil Boring Location Plan” provided in the RFP.

BORING NUMBER	BORING LOCATION
B1	43.44553° N; -96.17520° W
B2	43.44543° N; -96.17504° W
B3	43.44561° N; -96.17487° W
B4	43.44552° N; -96.17472° W

The borings were advanced utilizing solid flight auger drilling methods and soil samples were routinely obtained during the drilling process. Select soil samples were later tested in the laboratory to determine the material’s engineering properties for our evaluation.

Soil sampling and laboratory testing were accomplished generally in accordance with ASTM procedures. The borings were backfilled with on-site material after performing our work; however, it should be noted that some settlement of the backfill material may occur and it is the client's responsibility to backfill the borings once we have left the site.

The surface conditions below the surface material generally consisted of lean clay topsoil, lean clay with sand alluvium, poorly graded sand with silt and gravel alluvium, poorly graded sand with silt alluvium, and sandy lean clay alluvium. It should be noted that the poorly graded sand encountered below the water table was not tested for natural moisture content in the laboratory. These materials are described in more detail in the following table.

Material	Moisture Content (%)	Dry Density (PCF)	Saturation (%)	Hand Penetrometer (TSF)	Standard Penetration Test (BPF)
Lean Clay Topsoil	17	98	66	4.5	14
Lean Clay with Sand Alluvium	22-24	101	91	4.5	7
Poorly Graded Sand Alluvium	4-10	-	-	-	11-32
Sandy Lean Clay Alluvium	24	-	-	-	11

The boring logs included in the Appendix should be reviewed for specific information at individual boring locations. The boring logs include soil/rock descriptions, stratifications, penetration resistances, and locations of the samples and laboratory test data. The stratifications shown on the boring logs represent the conditions only at the actual boring locations. Variations may occur and should be expected between boring locations. The stratifications represent the approximate boundary between subsurface materials and the actual transition may be gradual. Water level information obtained during field operations is also shown on these boring logs. The samples that were not altered by laboratory testing will be retained for 30 days from the date of this report and then will be discarded.

Water Level Measurements

Free water was encountered in Borings B2 and B3 at depths of 6 feet below the existing grade at the time of drilling. Water levels should be expected to fluctuate with changes in climatic conditions. The water level measurements presented in this report are the levels that were measured at the time of our field activities.

EVALUATIONS AND RECOMMENDATIONS

Geotechnical Discussion Bus Barn

CTS has two concerns from a geotechnical standpoint. The first concern is the topsoil material encountered in the top 1.5 feet to 2 feet in Borings B2 and B3. CTS recommends that the topsoil material be removed in the building area and be replaced with material meeting the recommendations in the “Site Preparation” section of this report.

The second concern would be for the poorly graded sand alluvial material that may be encountered at foundation grade to become disturbed due to normal construction activity, depending on the final bottom elevation of the frost depth foundations. CTS recommends that a minimum of the top 12 inches of granular material, if encountered, be compacted to meet the recommendations in the “Site Preparation” section of this report prior to new structural fill or foundation placement.

The seismic site classification for the site soils, in accordance with ASCE 7, Chapter 20, is a Class D. Due to the low seismic activity in the area, we are not aware of special designs or details for foundations due to seismic action.

Geotechnical Discussion Pavement Subgrade Preparation

The main concern for the pavement areas is the depth of topsoil material encountered in the top 1 foot to 2 feet of Borings B1 and B4. CTS does not recommend that pavement be placed directly on top of topsoil material. CTS recommends that the pavement be placed on a minimum of 18 inches of material meeting the recommendations in the “Site Preparation” section of this report.

After the topsoil material has been addressed, as discussed above, final site preparation should consist of scarifying, moisture conditioning and compacting the top 12 inches of the subgrade to meet the recommendations of the “Site Preparation” section of this report the day prior to pavement placement. If there is a delay between subgrade preparation and paving, the moisture content of the pavement subgrade would need to be checked the day before or the day of the pavement placement to determine if the moisture content of the prepared subgrade meets the recommendations of the “Site Preparation” section of this report. Material that does not meet the moisture recommendations will need to be scarified, moisture conditioned and compacted to meet the recommendations of the “Site Preparation” section of this report prior to pavement and granular base placement, if applicable. If a granular base is used, the granular base should be placed the day before the pavement placement and after the moisture content of the subgrade has been tested. The granular base should be a 1 ½-inch minus well-graded gravel with less than 5 percent passing the #200 sieve and the material passing the #200 sieve should not contain clay. CTS recommends that subdrains be installed if a granular base is used. Subdrains should consist of 4-inch to 6-inch heavy walled perforated pipe and should be installed a minimum of 42 inches below the top of pavement surface to reduce the potential for water to freeze in the drains. The subdrains should be installed no more than 20 feet apart

or the pavement subgrade should be sloped to allow water to flow towards the drains. The subdrains should drain to a suitable means of disposal. The chance for frost heave issues to occur goes up greatly if the subgrade soils undergo an increase in moisture content prior to paving. Frost heave can result in the pavement heaving and cracking. If curbs and gutters are installed, they should be backfilled as soon as the curb and gutter concrete has achieved adequate strength, usually in 3 days to 7 days. If curbs and gutters are not installed, the edge of the pavement should be backfilled within 3 days to 7 days of the pavement being placed. The purpose of backfilling behind the curbs, gutters and edge of pavement as soon as possible is to eliminate areas where water can pond and cause frost heave issues under the pavement due to water migrating under the pavement. The owner should be aware that this procedure will help to minimize frost heave; however, some frost heave may occur. All work should meet the requirements of SUDAS, if applicable.

Geotechnical Discussion Gravel Access Road

CTS recommends that the subgrade preparation in the gravel access road consist of removing the highly organic material in the top 8 inches of the roadway and then scarifying and recompacting the next 12 inches of subgrade to meet the recommendations in the “Site Preparation” section of this report. Then a geogrid such as Mirafi® BXG 110 or equivalent should be placed on the subgrade to create an all-weather road. Then a minimum of 8 inches of IDOT Gradation 14 should be compacted on top of the geogrid. It should be noted that yearly maintenance of the gravel road will be required, which may include adding additional gravel material.

Site Preparation

CTS recommends that topsoil, vegetation, roots, soft material, organic material, material containing frost, and unsuitable soils in the construction areas be stripped from the site and either wasted or stockpiled for later use in landscaping. The site lean clay soils, other than the topsoil, are suitable for use as structural fill material. A representative of the geotechnical engineer should determine the depth of removal at the time of construction.

After stripping and excavating to the proposed subgrade level as discussed in the various “Geotechnical Discussion” sections, the floor slab and pavement areas should be proofrolled with a loaded tandem axle dump truck, similar piece of heavy rubber-tired vehicle (typically with an axial load greater than 9-tons) or the heaviest rubber-tired equipment that will be used on the site. Soils that are observed to rut or deflect excessively (typically greater than 1-inch) under the moving load should be undercut and replaced with properly compacted fill. The proofrolling and undercutting activities should be witnessed by a representative of the geotechnical engineer and should be performed during a period of dry weather. If excessive movement is observed during the proofrolling, the proofrolling should be stopped and the site evaluated by the geotechnical engineer or their representative.

After subgrade preparation and observation have been completed, fill placement may begin. Fill materials should be a lean clay material free of organic or other deleterious materials, have a maximum particle size of less than 3 inches, and have a liquid limit less than 45 and plasticity index less than 22. Close moisture control of the lean clay materials will be

required in order to obtain compaction. Fill materials should not contain frost and new fill should not be placed on frozen ground.

Structural fill should be placed in maximum loose lifts of 4 inches for hand compaction equipment and 8 inches for riding compaction equipment and compacted to at least 95 percent of the material's standard Proctor maximum dry density for lean clay and 98 percent of the material's standard Proctor maximum dry density for granular material. Lean clay should be compacted to within a minus 3 percent to a plus 3 percent of the optimum moisture content as determined in general accordance with ASTM D 698 procedures. The moisture content of the material should be maintained between the recommended moisture contents until pavement is placed on the material. Materials that undergo increases or decreases in moisture content beyond the recommended moisture content ranges should be scarified, moisture conditioned and compacted to meet these moisture ranges just prior to the pavement being placed. Every other lift of compacted-engineered fill should be tested by a representative of the geotechnical engineer prior to placement of subsequent lifts.

Shallow Foundation Recommendations

The planned foundations for the bus barn can be supported on conventional foundations bearing on undisturbed natural material or new structural fill meeting the recommendations in the "Site Preparation" section of this report, as discussed in the "Geotechnical Discussion Bus Barn" section of this report. The foundations for the bus barn building columns and continuous footings for bearing walls can be designed for a net allowable soil bearing pressure of up to 2,000 PSF based on dead load plus design live load. Minimum dimensions of 24 inches for column footings, 12 inches for trenched footings and 18 inches for continuous footings should be used in foundation design to minimize the possibility of a local bearing capacity failure.

Exterior footings and footings in unheated areas should be located at a depth of 42 inches or deeper below the final exterior grade to provide adequate frost protection. If the structures are to be constructed during the winter months or if footings will likely be subjected to freezing temperatures after foundation construction, then all footings should be protected from freezing. Otherwise, interior footings can be located at nominal depths compatible with architectural and structural considerations.

The foundation excavations should be observed by a representative of CTS prior to steel or concrete placement to assess that the foundation materials are capable of supporting the design loads and are consistent with the materials discussed in this report. Soft or loose soil zones encountered at the bottom of the footing excavations should be removed to the level of competent naturally deposited soils or properly compacted structural fill as directed by the geotechnical engineer.

After opening, footing excavations should be observed and concrete placed as quickly as possible to avoid exposure of the footing bottoms to wetting and drying. Surface run-off water should be drained away from the excavations and not be allowed to pond. If possible, the foundation concrete should be placed during the same day the excavation is made. If it is

required that footing excavations be left open for more than one day, they should be protected to reduce evaporation or entry of moisture.

Consolidation testing was beyond the scope of this exploration. Based on the known subsurface conditions and site geology, laboratory testing, and past experience, we anticipate that properly designed and constructed footings supported on the recommended materials should experience total and differential settlements between adjacent columns and within a 50 feet length of wall of less than 1-inch and $\frac{3}{4}$ -inch, respectively.

Floor Slab Recommendations

The bus barn floor slab should be supported on a minimum of 12 inches of structural fill material meeting the recommendations of the “Site Preparation” section of this report, which will be created in most areas based on the existing topsoil material being removed and replaced, as discussed in the “Geotechnical Discussion Bus Barn” section of this report. **Final floor slab preparation, including density and moisture testing of the subgrade, should occur the day before or the day of the floor slab being placed.** CTS recommends that a compacted free draining granular mat with a minimum thickness of 4 inches be placed beneath the floor slab to enhance drainage. The granular mat should consist of coarse sand or well-graded gravel with a maximum size particle of 1-inch and have less than 5 percent passing the #200 sieve. The material passing the #200 sieve should not contain clay. Polyethylene sheeting, if used, should be placed in accordance with the “Manual of Concrete Practice of the American Concrete Institute”. The floor slabs should have an adequate number of joints to reduce cracking resulting from differential movement and shrinkage. Floor slabs should not be constructed on frozen ground.

Subgrade prepared as recommended would have a modulus of subgrade reaction, k value, of 72 kips per cubic foot (kcf), based on an allowable settlement of 1-inch, and friction factor of 0.3 that may be used in the slab-on-grade design.

Pavement Recommendations

Our scope of services did not include CBR testing of existing subgrade or potential sources of imported fill for the specific purpose of detailed pavement analysis. Instead, we have assumed pavement-related design parameters that are considered to be typical for the area soils types. **If conditions other than those found in our borings are encountered, CTS should be notified to determine if the recommendations presented below are valid.**

The recommended thicknesses presented below are not considered to be an equivalent section for comparing asphalt versus concrete. We understand that given budgetary considerations, it may be desirable to place thinner pavement sections than those presented. However, the client and the project principals should be aware that thinner pavement sections may result in increased maintenance costs and lower than anticipated pavement life. It is recommended that the pavement areas be prepared as discussed in the “Geotechnical Discussion Pavement Subgrade Preparation” and “Site Preparation” sections of this report.

The following CTS recommendation is based on the subgrade soils being prepared to achieve a minimum CBR of 2 to 3. Based on our analysis, using the Concrete Pavement Analyst software provided by the National Ready Mixed Concrete Association, the following equivalent pavement sections were calculated:

PAVEMENT MATERIALS*	BUS BARN
Asphaltic Surface Course	1.5 Inches
Asphaltic Binder Course	7 Inches
Granular Base**	6 Inches
Portland Cement Concrete	7 Inches

* Pavement materials should conform to local and state guidelines, if applicable.

**Granular base and subdrains are recommended under asphalt

Rigid concrete pavement is recommended under trash dumpsters or where a considerable load is transferred from relatively small steel wheels. This should provide better distribution of surface loads to the subgrade without causing deformation of the surface. Trash dumpster pads should be at least 7 inches thick and properly reinforced.

The work should be performed in accordance with State Department of Transportation guidelines and SUDAS, if applicable.

CONSTRUCTION CONSIDERATIONS

CTS should be retained to provide observation and testing of construction activities involved in the foundation, earthwork, and related activities of this project. CTS cannot accept responsibility for conditions that deviate from those described in this report, nor for the performance of the foundation system if not engaged to also provide construction observation and testing for this project.

Moisture Sensitive Soils and Weather Related Concerns

The fine-grained soils encountered at this site will be sensitive to disturbances caused by construction activities and to changes in moisture content. During wet weather periods, increases in the moisture content of the soil can cause significant reduction in the soil strength and support capabilities. In addition, soils that become wet may be slow to dry and thus significantly retard the progress of grading and compaction activities. It will, therefore, be advantageous to perform earthwork and foundation construction activities during dry weather.

Drainage and Groundwater Considerations

Water should not be allowed to collect in the foundation excavation, on floor slab areas, or on prepared subgrade of the construction area either during or after construction. Undercut

or excavated areas should be sloped toward one corner to facilitate removal of collected rainwater, groundwater, or surface runoff. Positive site drainage should be provided to reduce infiltration of surface water around the perimeter of the structures and beneath the floor slabs. Surface drainage should be collected and discharged such that water is not permitted to infiltrate the backfill and floor slab areas. Footings and slab subgrade should be inspected prior to placing of reinforcing steel and concrete, particularly after heavy rains or when water has set on the subgrade.

Free groundwater was encountered in Borings B2 and B3 at a depth of 6 feet below the existing grade at the time of drilling and may affect construction. It is possible that seasonal variations will cause fluctuations or a water table to be present in the upper soils. Water should be removed from excavations by pumping. Should excessive and uncontrolled amounts of seepage occur the geotechnical engineer should be consulted.

Excavations

In Federal Register, Volume 54, Number 209 (October 1989), the United States Department of Labor, Occupational Safety and Health Administration (OSHA) amended its "Construction Standards for Excavations, 29 CFR, part 1926, Subpart P". This document was issued to better enhance the safety of workers entering trenches or excavations. It is mandated by this federal regulation that excavations, whether they be utility trenches, basement excavation or footing excavations, be constructed in accordance with the new OSHA guidelines. It is our understanding that these regulations are being strictly enforced and if they are not closely followed, the owner and the contractor could be liable for substantial penalties.

The contractor is solely responsible for designing and constructing stable, temporary excavations and should shore, slope, or bench the sides of the excavations as required to maintain stability of both the excavation sides and bottom. The contractor's "responsible person", as defined in 29 CFR Part 1926, should evaluate the soil exposed in the excavations as part of the contractor's safety procedures. In no case should slope height, slope inclination, or excavation depth, including utility trench excavation depth, exceed those specified in local, state, and federal safety regulations. The site lean clay soils are a Class B material and the sand soil is a Class C material in accordance with OSHA criteria.

We are providing this information solely as a service to our client. CTS does not assume responsibility for construction site safety or the contractor's or other party's compliance with local, state, and federal safety or other regulations.

REPORT LIMITATIONS

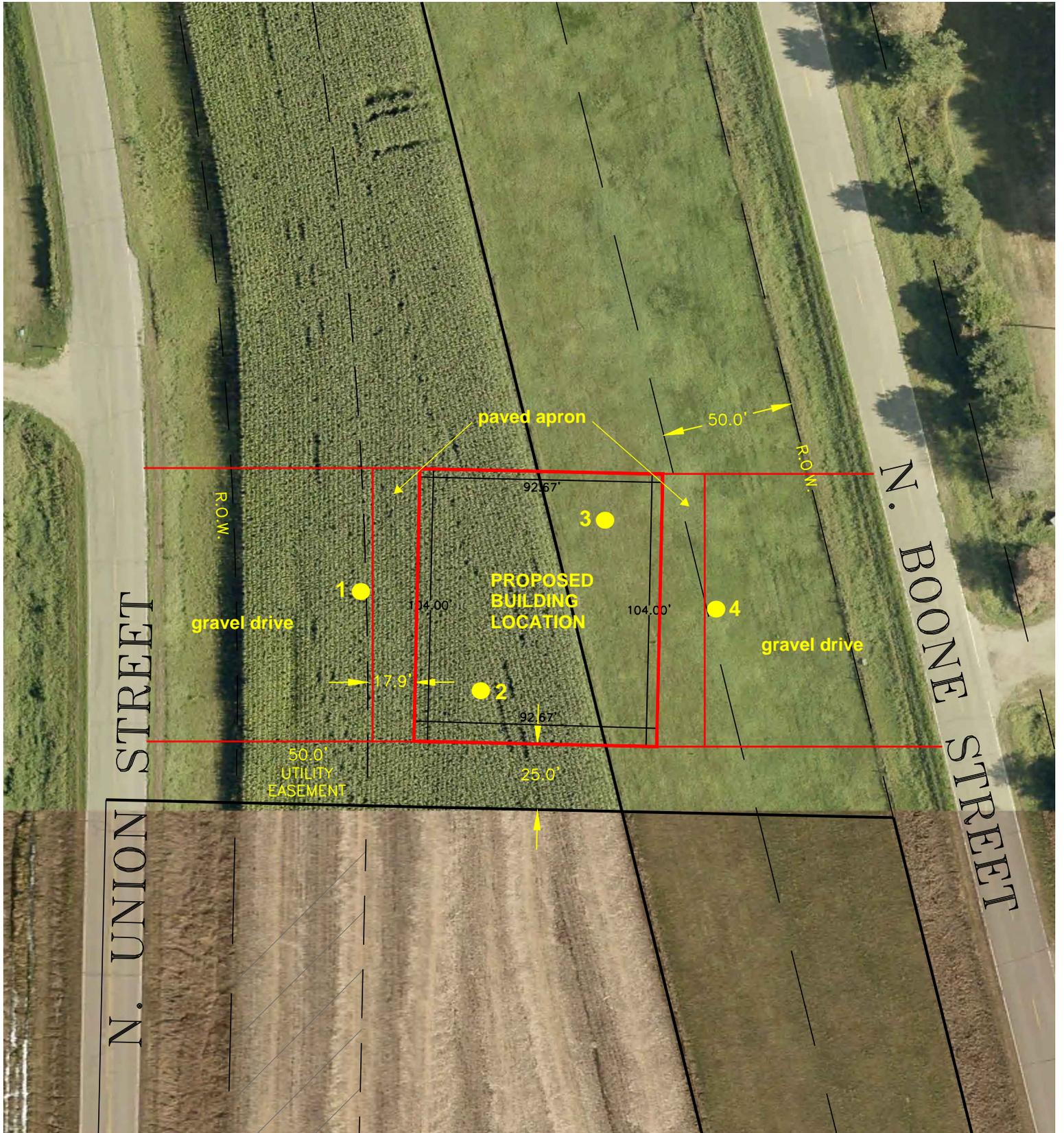
The recommendations submitted are based on the available subsurface information obtained by CTS and design details furnished by Mr. Matt Basye, Vice President/Architect for FEH Design. If deviations from the subsurface conditions noted in this report are encountered during construction, CTS should be notified immediately to determine if changes in the foundation recommendations are required. If CTS is not retained to perform these functions, CTS will not be responsible for the impact of those conditions on the project.

The geotechnical engineer warrants that the findings, recommendations, specifications, or professional advice contained herein have been made in accordance with generally accepted professional geotechnical engineering practices in the local area. No other warranties are implied or expressed.

After the plans and specifications are complete, the geotechnical engineer should be retained and provided the opportunity to review the final design plans and specifications to check that our engineering recommendations have been properly incorporated into the design documents. At that time, it may be necessary to submit supplementary recommendations. This report has been prepared for the exclusive use of the Central Lyon Community School District and their consultants for the specific application to the Bus Barn Alternate Site project in Rock Rapids, Iowa.

APPENDIX

BORING LOCATION PLAN



SOIL BORING LOCATION PLAN
PROPOSED BUS BARN FACILITY
CENTRAL LYON CSD
 scale 1" = 50'



BORING LOGS



LOG OF EXPLORATORY BORING

Job Number: **G7020**
 Project: **Central Lyon Bus Barn**
 Date Started: **5/12/23**
 Date Completed: **5/12/23**

Boring No.: **B-1**
 Boring Location: **Rock Rapids, IA**
 Drill Type: **Flight Auger**
 Ground Elev.: **96.8**

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Percent Fines
		<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>■ Shelby Tube</p> <p>⊠ Modified California</p> </div> <div style="width: 20%;"> <p>⊠ Standard Split Spoon</p> <p>✋ Grab Sample</p> </div> <div style="width: 20%;"> <p>∇ Water Level ATD</p> <p>∇ Water Level @ 24-Hours</p> </div> </div>												
			12-Inch Root Zone											
			LEAN CLAY WITH SAND, Dark Brown to Light Brown, Very Moist, Stiff, Alluvium	CL	2-3-4 N= 7	24								
			POORLY GRADED SAND WITH SILT AND GRAVEL, Light Gray Brown, Moist, Medium Dense, Alluvium	SP-SM	5-13-14 N= 27	10								
5			END OF BORING AT 5 FEET FREE WATER WAS NOT ENCOUNTERED AT TIME OF DRILLING											

LOG OF EXPLORATORY BORING



Job Number: G7020
Project: Central Lyon Bus Barn
Date Started: 5/12/23
Date Completed: 5/12/23

Boring No.: B-2
Boring Location: Rock Rapids, IA
Drill Type: Hollow Stem
Ground Elev.: 95.5

Depth in Feet	Graphic Log	Sample Type	SOIL DESCRIPTION	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Percent Fines
			12-Inch Root Zone											
			LEAN CLAY WITH ROOTS, Dark Brown, Moist, Topsoil	CL		22	101	91	4.50					
			LEAN CLAY WITH SAND, Light Brown, Very Moist, Alluvium	CL										
5			POORLY GRADED SAND WITH SILT AND GRAVEL, Light Gray Brown, Moist to Wet, Medium Dense to Dense, Alluvium	SP-SM	7-12-13 N= 25	4								
					10-15-17 N= 32									
					8-10-11 N= 21									
15			SANDY LEAN CLAY, Grayish Yellow Brown, Wet, Stiff, Alluvium	CL	9-5-6 N= 11	24								
			END OF BORING AT 15 FEET FREE WATER WAS ENCOUNTERED AT 6 FEET AT TIME OF DRILLING											

LOG OF BORING G7020.GPJ CERTIFIED TESTING.GDT 5/23/23

LOG OF EXPLORATORY BORING



Job Number: G7020
Project: Central Lyon Bus Barn
Date Started: 5/12/23
Date Completed: 5/12/23

Boring No.: B-3
Boring Location: Rock Rapids, IA
Drill Type: Hollow Stem
Ground Elev.: 97.0

Depth in Feet	Graphic Log	Sample Type	<div style="display: flex; justify-content: space-between;"> <div style="width: 30%;"> <p> Shelby Tube Modified California </p> </div> <div style="width: 30%;"> <p> Standard Split Spoon Grab Sample </p> </div> <div style="width: 30%;"> <p> Water Level ATD Water Level @ 24-Hours </p> </div> </div>	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Percent Fines
			SOIL DESCRIPTION											
			12-Inch Root Zone											
			LEAN CLAY WITH ROOTS, Dark Brown, Moist, Topsoil											
			LEAN CLAY WITH SAND, Dark Brown to Light Brown, Moist, Alluvium	CL	3-7-7 N= 14	17								
5			POORLY GRADED SAND WITH SILT, Light Gray Brown, Moist to Wet, Medium Dense, Alluvium	SP-SM	7-14-14 N= 28	4								
					3-8-9 N= 17									
10					3-5-6 N= 11									
			(Clay Lense)		3-11-15 N= 26									
15	END OF BORING AT 15 FEET FREE WATER WAS ENCOUNTERED AT 6 FEET AT TIME OF DRILLING													

LOG OF BORING_G7020.GPJ_CERTIFIED TESTING.GDT_5/23/23

LOG OF EXPLORATORY BORING

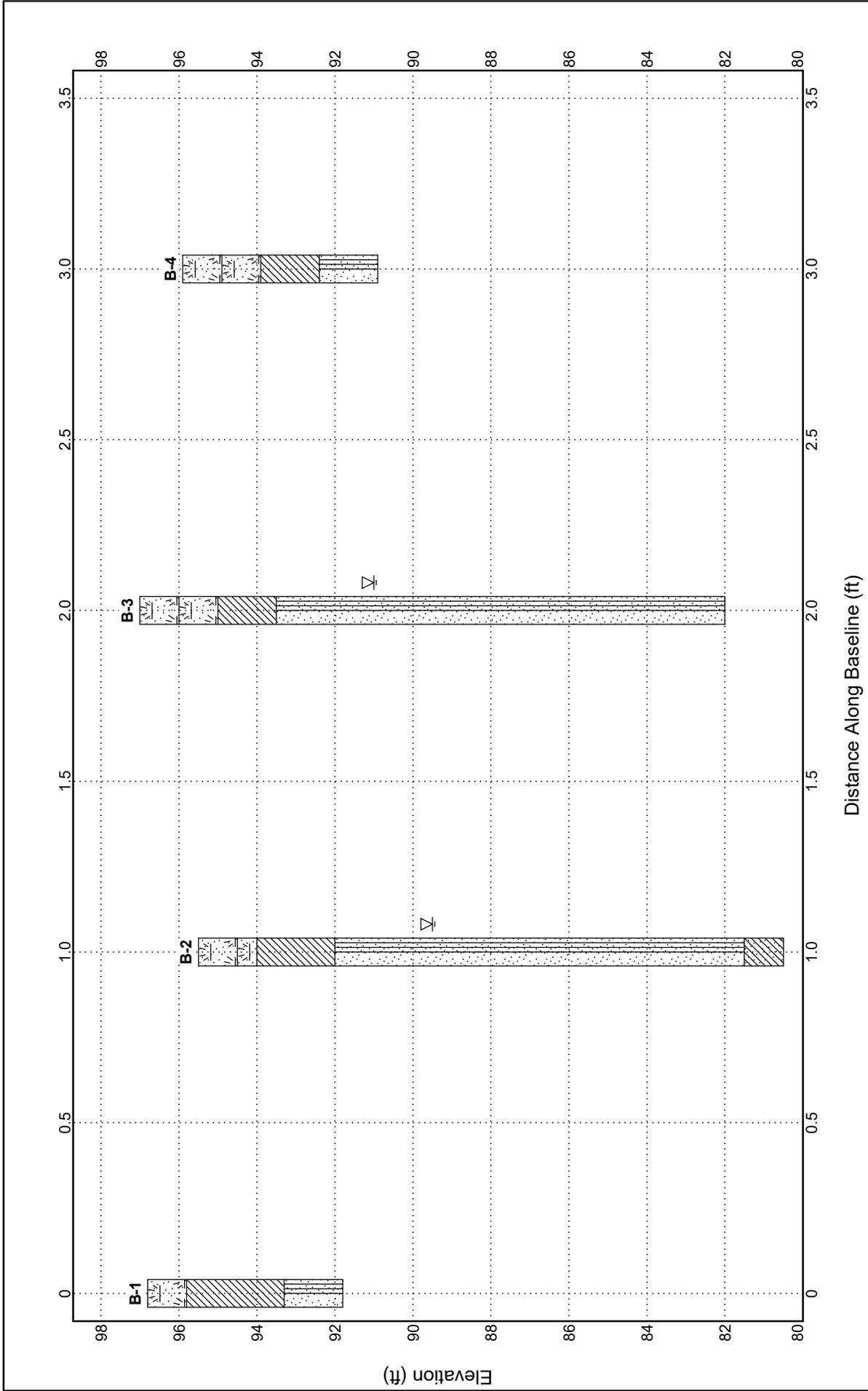


Job Number: G7020
Project: Central Lyon Bus Barn
Date Started: 5/12/23
Date Completed: 5/12/23

Boring No.: B-4
Boring Location: Rock Rapids, IA
Drill Type: Flight Auger
Ground Elev.: 95.9

Depth in Feet	Graphic Log	Sample Type	USCS	Blow Counts SPT (N) Blows/Foot	Moisture Content, %	Dry Density (PCF)	% Saturation	Hand Penetrometer (TSF)	Unconfined Comp. Strength (TSF)	Liquid Limit %	Plastic Limit %	Plasticity Index %	Percent Fines
		<div style="display: flex; justify-content: space-between;"> <div> Shelby Tube Modified California </div> <div> Standard Split Spoon Grab Sample </div> <div> Water Level ATD Water Level @ 24-Hours </div> </div>											
SOIL DESCRIPTION													
		12-Inch Root Zone											
		LEAN WITH SAND, Dark Brown to Medium Brown, Moist, Topsoil			17	98	66	4.50					
		LEAN CLAY WITH SAND, Light Brown, Moist, Alluvium	CL										
		POORLY GRADED SAND WITH SILT, Light Gray Brown, Moist, Medium Dense, Alluvium	SP-SM	5-13-14 N= 27	5								
5		END OF BORING AT 5 FEET FREE WATER WAS NOT ENCOUNTERED AT TIME OF DRILLING											

BORING PROFILES



Distance Along Baseline (ft)



Certified Testing Services, Inc.
419 W. 6th Street, PO Box 1193
Sioux City, Iowa 51102
Telephone: 712-252-5132
Fax: 712-252-0110

Central Lyon Bus Barn
Rock Rapids, IA

SOIL CLASSIFICATION CHART AND GENERAL NOTES

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
<p>COARSE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE</p>	<p>GRAVEL AND GRAVELLY SOILS</p>	<p>CLEAN GRAVELS</p> <p>(LITTLE OR NO FINES)</p>		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		<p>GRAVELS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	<p>SAND AND SANDY SOILS</p>	<p>CLEAN SANDS</p> <p>(LITTLE OR NO FINES)</p>		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		<p>SANDS WITH FINES</p> <p>(APPRECIABLE AMOUNT OF FINES)</p>		SM	SILTY SANDS, SAND - SILT MIXTURES
	<p>FINE GRAINED SOILS</p> <p>MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE</p>	<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT LESS THAN 50</p>		ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
<p>SILTS AND CLAYS</p> <p>LIQUID LIMIT GREATER THAN 50</p>			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS	
			CH	INORGANIC CLAYS OF HIGH PLASTICITY	
<p>HIGHLY ORGANIC SOILS</p>				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
<p>HIGHLY ORGANIC SOILS</p>				PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

GENERAL NOTES

SAMPLING SYMBOLS:

✕	STANDARD PENETRATION TEST – 1 3/8" I.D., 2" O.D.
■	SHELBY THIN-WALLED TUBE – 3" O.D. UNDISTURBED SAMPLE
✎	GRAB SAMPLE
■	ROCK CORE
⚓	AUGER SAMPLE
○	NO RECOVERY

WATER LEVEL MEASUREMENT SYMBOLS:

▽	WATER LEVEL AT TIME OF DRILLING
▽	WATER LEVEL AFTER 7 DAYS

CONSISTENCY OF FINE-GRAINED SOILS	
UNCONFINED COMPRESSIVE STRENGTH, QU, PSF	CONSISTENCY
< 500	VERY SOFT
500 - 1,000	SOFT
1,001 - 2,000	MEDIUM
2,001 - 4,000	STIFF
4,001 - 8,000	VERY STIFF
8,001 - 16,000	HARD
> 16,000	VERY HARD

RELATIVE DENSITY OF COARSE GRAINED SOILS	
N-BLOWS/FT.	RELATIVE DENSITY
0 - 3	VERY LOOSE
4 - 9	LOOSE
10 - 29	MEDIUM DENSE
30 - 49	DENSE
50 - 80	VERY DENSE
80 +	EXTREMELY DENSE

RELATIVE PROPORTIONS OF SAND AND GRAVEL	
DESCRIPTIVE TERM(S) (OF COMPONENTS ALSO PRESENT IN SAMPLE)	PERCENT OF DRY WEIGHT
WITH	15 - 29
MODIFIER	> 30

GRAIN SIZE TERMINOLOGY	
MAJOR COMPONENT OF SAMPLE	SIZE RANGE
BOULDERS	OVER 12 IN. (300MM)
COBBLES	12 IN. TO 3 IN. (300 MM TO 75 MM)
GRAVEL	3 IN. TO #4 SIEVE (75MM TO 4.75MM)
SAND	#4 TO #200 SIEVE (4.75MM TO 0.075 MM)
SILT OR CLAY	PASSING #200 SIEVE (0.075MM)

RELATIVE PROPORTIONS OF FINES	
DESCRIPTIVE TERM(S) (OF COMPONENTS ALSO PRESENT IN SAMPLE)	PERCENT OF DRY WEIGHT
WITH	15 - 29
MODIFIER	> 30



SECTION 00 31 50

ELECTRONIC DOCUMENTS POLICY

1.1 SUBMITTAL PROCEDURES

- A. General: Electronic copies of CAD files or the Revit electronic building model may be provided by Architect for Contractor's use in preparing submittals at the Architect's discretion.

1.2 CONTRACTOR'S USE OF ARCHITECT'S CAD FILES

- A. General: At Contractor's written request, copies of Architect's CAD files may be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
 - 1. Electronic copies of plan-type drawings will be made available at a cost of \$100.00 for each requested drawing. Electronic copies will be distributed upon receipt of service fee.
 - 2. Contractor making request shall not distribute files to other parties.
 - 3. Contractor making request shall provide a signed copy of the ELECTRONIC FILE TRANSFER TO CONTRACTOR AGREEMENT (section 00 31 51).
 - 4. Electronic files may be used as background information only. Architect will not accept printed copies of the electronic document as shop drawings.
 - 5. CAD files for disciplines other than those prepared by the Architect/Structural Engineer must be obtained directly from the appropriate party (examples: Architect's consulting M/E/P engineers, Owner's consulting civil engineer, etc).

1.3 CONTRACTOR'S USE OF ARCHITECT'S BUILDING MODEL

- A. General: At Contractor's written request, a copy of the Architect's Revit building model may be provided to Contractor for Contractor's use in connection with Project, subject to the following conditions:
 - 1. The electronic building model will be made available at a cost of \$500.00 for each building model. Building model will be distributed upon receipt of service fee.
 - 2. Contractor making request shall not distribute the building model to other parties.
 - 3. Contractor making request shall provide a signed copy of the ELECTRONIC ARCHITECTURAL BUILDING MODEL FILE TRANSFER AGREEMENT (section 00 31 52).

4. Building model may be used as background information only. Architect will not accept printed copies of the building model as shop drawings.
5. Building model(s) for disciplines other than those prepared by the Architect/Structural Engineer must be obtained directly from the appropriate party (examples: Architect's consulting M/E/P engineers, Owner's consulting civil engineer, etc.).

END OF SECTION

SECTION 00 31 51

ELECTRONIC FILE TRANSFER TO CONTRACTOR AGREEMENT

Dear *Contractor requesting Files*:

At your request, FEH Design may provide electronic files for your convenience and use in the preparation of shop drawings related to **Project Name**, subject to the following terms and conditions:

Our electronic files are generated with **Auto Desk** software. FEH Design makes no representation as to the compatibility of these files with your hardware or your software. Please advise FEH Design of the desired AutoCAD version you are requesting.

Data contained on these electronic files are part of our instruments of service and shall not be used by you for any purpose other than as a convenience in the preparation of the shop drawings for the referenced project. Any other use or reuse by you or by others will be at your sole risk and without liability or legal exposure to FEH Design. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against FEH Design, our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of these electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold FEH Design harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents. Differences may exist between these electronic files and corresponding hard-copy construction documents. FEH Design makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed or sealed hard-copy construction documents, the signed or sealed hard-copy shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

Because information presented on the electronic files can be modified, unintentionally or otherwise, FEH Design reserves the right to remove all indicia of ownership and/or involvement from each electronic display.

FEH Design will furnish you electronic files of the following drawing sheets:

List of Contractor Requested Drawings

AutoCAD version (ie. AutoCAD 2010, etc.)

A service fee of **\$100.00 (one hundred dollars)** per sheet shall be remitted to FEH Design prior to delivery of the electronic files.

Under no circumstances shall delivery of the electronic files for use by you be deemed a sale by FEH Design, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall FEH Design be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

(Contractor name and title)

(Officer or Legally Responsible Party)

(Company)

(Title)

(Address)

(Date)

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SECTION 00 31 52

ELECTRONIC ARCHITECTURAL BUILDING MODEL FILE TRANSFER AGREEMENT

At **Contractor** (recipient) request, FEH Design may provide an electronic architectural building information model file for your convenience and use in the preparation of shop drawings, as-built drawings, and/or file documentation related to the **Central Lyon CSD 2024 Facility Improvements**, subject to the following terms and conditions:

Our electronic files are generated with **Auto Desk REVIT Architecture** software and will be provide as such in the version the model was created in by FEH Design without conversion. FEH Design makes no representation as to the compatibility of these files with your hardware or your software.

In accepting and utilizing the model or other data on any form of electronic media generated and provided by FEH Design, the Recipient covenants and agrees that the model and data are instruments of service of FEH Design, who shall be deemed the author of the model and data, and shall retain all common law, statutory law and other rights, including copyrights. Data contained on these electronic files are part of our instruments of service and shall not be used by you for any purpose other than as a convenience in the preparation of the shop drawings, as-built drawings, and/or file documentation for the referenced project. Any other use or reuse is prohibited by you or by others and will be at your sole risk and without liability or legal exposure to FEH Design. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against FEH Design, our officers, directors, employees, agents or sub-consultants that may arise out of or in connection with your use of these electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold FEH Design harmless against all damages, liabilities or costs, including reasonable attorney's fees and defense costs arising out of or resulting from your use of these electronic files.

These electronic files are not construction documents or intended for material fabrications. Differences may exist between these electronic building model files and corresponding hard-copy contract documents. FEH Design makes no representation regarding the accuracy or completeness of the electronic building information model files you receive. In the event that a conflict arises between the signed or sealed hard-copy contract documents, the signed or sealed hard-copy shall govern. You are responsible for determining if any conflict exists. By your use of these electronic building information model files, you are not relieved of your duty to fully comply with the contract documents, including, and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other contractors for the project.

- A. Please note that FEH Design does not assure that the electronic model represents all the following changes:
1. **Addendum Items**
 2. **Architectural Supplemental Information (ASI)**
 3. **Request For Information (RFI)**
 4. **Change Orders**
 5. **Alternate Bid Items,**
 6. **Other post Bidding Contractual Modifications that alter, change or clarify the scope of work.**
- B. Model Level of Development: The following architectural model Level of Development description generally identifies the specific content to be included in the electronic model:
1. Electronic information suitable for construction contract drawing plans, exterior elevations, basic building sections and interior elevations as indicated on the printed contract drawings as issued by FEH Associates to the Owner and Contractor. Drawing views of other elevations, plans and sections not on the printed contract drawings issued by FEH Design may not be fully developed for use by the Recipient.
 2. The architectural model **will not** be setup by FEH Design for cost estimating, building systems analysis, project scheduling, material fabrication or virtual representation of all proposed building elements.

3. The building model will be for final, completed contract construction requirements for the project and will not signify contractor “Means and Methods” of construction.

Because information presented on the electronic building information model files can be modified, unintentionally or otherwise, FEH Design reserves the right to remove all indicia of professional seals, ownership and/or involvement from each electronic model, including drawing sheet views. FEH Design also reserves the right to remove all project details derived directly or indirectly from each electronic model.

A service fee of \$500.00 (five hundred dollars) per architectural model generated by FEH shall be remitted to FEH Design prior to delivery of the electronic files. **Only the architectural and structural model(s) are available through FEH Design. Mechanical and Electrical models must be obtained directly from the engineer of record.**

Under no circumstances shall delivery of the electronic files for use by the Recipient be deemed a sale by FEH Design, and we make no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall FEH Design be liable for any loss of profit or any consequential damages as a result of your use or reuse of these electronic files.

By signing below, I certify that I am authorized to act on the Recipient’s behalf and have read, understand and accept the conditions of this Agreement

(Contractor/Recipient name and title)

(Officer or Legally Responsible Party)

(Company)

(Title)

(Address)

(Date)

(Email Address)



Release of Liability and Indemnification Electronic Data Transfer

DGR Engineering

Date: _____

_____ (Recipient) has requested Electronic data, which may include text, drawings, spreadsheets, numeric data or other information, from DeWild Grant Reckert and Associates Company, d/b/a DGR Engineering (DGR). In consideration for receiving these data, Recipient hereby agrees and covenants that:

Any information provided by DGR is for informational purposes only. Recipient acknowledges that the information provided may be in draft form, may be incomplete or may require interpretation to yield beneficial results. Accordingly, DGR makes no representations as to the accuracy or utility of this information. If for any reason a conflict exists between information transmitted electronically and certified, signed documents, the information on the signed documents is to be interpreted as correct.

All data prepared by DGR are considered as instruments of service and are the property of DGR, which expressly reserves all ownership rights including any common law or statutory copyrights. The recipient of this information shall not use this information for purposes other than project information without the prior written authorization of DGR. The data may be in a preliminary or intermediate stage and may not be complete or in final form and may not be intended for construction use. Use by the Recipient or a third party to whom the data is provided by the Recipient shall be at the Recipient's or third party's risk.

The recipient agrees, to the fullest extent permitted by law, to release, defend, indemnify, and hold DGR harmless from and against any claim liability or cost (including attorney's fees and defense costs, whether or not a suit is filed) arising or allegedly arising out of any use, reuse or modification of the information by the recipient or any person or entity that acquires or obtains the information from the recipient. This release and agreement to defend, indemnify and hold DGR harmless also applies to the use of this information on any project or construction site without the involvement of DGR in said use of information.

The drawings and/or data conform to the file format used by DGR at the time the data was created. DGR makes no representation as to the utility of the data for present or future uses. The recipient agrees to the fullest extent permitted by law to release and indemnify, defend, and hold harmless DGR from and against any and all claims, liabilities, losses, damages, and cost, including but not limited to attorney's fees arising out of, or in any way connected with, the incompatibility, usability, readability, or durability of drawings and/or data obtained.

If the request is for a current DGR project, minimum compensation in the amount of \$250 shall be paid to DGR prior to the delivery of the electronic design files. Files provided will be in AutoCAD Civil 3D format, which were used in creation of the plans. Providing additional information, files and services beyond the AutoCAD design file, including but not limited to, GIS surface files, shall be billed for and paid separately at an agreed upon hourly rate between DGR and the Requestor.

DGR Project: **Central Lyon CSD 2024
Facility Improvements**

Name: _____
(Please Print)

DGR Project No:

Signature _____

Files Included:

Title: _____

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SECTION 00 41 00

BID FORM

THE PROJECT AND THE PARTIES

2.01 TO: Central Lyon Community School District (Owner)
1010 South Greene Street, Rock Rapids, Iowa 51246

2.02 FOR:

- A. Project Identification: 2024 Facility Improvements
- B. **Project No.** : 2022018.07
- C. **BIDS DUE:** Thursday, November 16, 2023 at 11:00 am local time.
- D. **BID LOCATION:** Central Lyon Community School District Board Room, 1010 South Greene Street, Rock Rapids, IA 51246

2.03 SUBMITTED BY: (Bidder to enter name and address)

- A. Bidder's Full Name _____
- Address _____
- City, State, Zip _____
- Phone: _____

2.04 ADDENDA

- A. The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.
 - 1. Addendum # _____ Dated _____.
 - 2. Addendum # _____ Dated _____.
 - 3. Addendum # _____ Dated _____.
 - 4. Addendum # _____ Dated _____.

2.05 OFFER

- A. The Bidder, in compliance with Advertisement for Bid, having examined the drawings and specifications with related documents and the site of the proposed work, and being familiar with all of 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 and to deconstruct and demolish the Project in accordance with the Contract Documents, within the time set forth therein, and at the prices stated below.

B. ALL work is being bid as one prime contract under Two (2) Bid Packages.

Bidder agrees to perform all Contract Work, including demolition, architectural, structural, mechanical, electrical, plumbing, sitework and utilities on both Bid Packages and Alternates, described in the Bid Documents.

1. Bidders are REQUIRED to bid on BOTH Bid Packages, Alternates and Unit Prices. Any Contractor not bidding BOTH Bid Packages, Alternates and Unit Prices will risk bid disqualification.
2. Owner will determine the final scope of work by selecting any or all combinations of Bid Packages and/or Alternates from a SINGLE contractor based on the low total combined cost of the selected Bid Packages and/or Alternates and Unit Prices. Owner may select ANY combination of these items to determine the lowest responsible responsive bidder.
3. ONE contractor will be selected to do the work based on the low total bid cost for any combination of Bid Packages and/or Alternates selected. Projects WILL NOT be broken up so that more than one contractor is used.

C. Accompanying this Bid is a certified check, cashier's check, or Bid Bond as Bid Security, as required by the Bidding Documents.

1. BID PACKAGE A: BUS BARN

State the cost to complete all work associated with the new bus barn under this bid package.

(Bidder to write out amount in text)

(Dollars \$ _____)

(Bidder to write out amount in numbers)

1A. ALTERNATE A-C1: ADD CONCRETE PAVING

State the cost to add concrete paving on the east and west sides of the bus barn per the civil drawings/specs.

(ADD) _____

(Dollars \$ _____)

(Bidder to write out amount in numbers)

1C. UNIT PRICE NO. A-UP1: Unsuitable Soils Removal and Replacement – Building Area.

State the cost per CY to remove unsuitable soils discovered under the building area during construction/testing and replace with suitable materials outside of the work required by the contract documents.

ADD or DEDUCT _____

Dollars (\$ _____) per CY.

1D. UNIT PRICE NO. A-UP2: Unsuitable Soils Removal and Replacement – Paving.

State the cost per CY to remove unsuitable soils discovered under paving during construction/testing and replace with suitable materials outside of the work required by the contract documents.

ADD _____

Dollars (\$ _____) per CY.

2. BID PACKAGE B: PEDESTRIAN BRIDGE REPAIR

State the cost to complete all work associated with the pedestrian bridge repairs under this bid package.

(Bidder to write out amount in text)

(Dollars \$ _____)

(Bidder to write out amount in numbers)

2.06 ACCEPTANCE

A. This offer shall be open to acceptance for 30 consecutive calendar days from the bid closing date.

B. If this bid is accepted by Owner within the time period stated above, we will:

1. Execute the Agreement within seven days of receipt of Notice of Award.
2. Furnish the required bonds within seven days of receipt of Notice of Award.

- C. If this bid is accepted within the time stated, and we fail to commence the Work or we fail to provide the required Bond(s), the security deposit shall be forfeited as damages to Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.
- D. In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.
- E. The Owner reserves the right to reject any or all bids submitted, re-advertise for new bids, and to waive any informalities therein in the best interest of the Central Lyon Community School District.

2.07 TIME OF COMPLETION

- A. Specified Substantial Completion Dates:
 - 1. Bid Package A – Bus Barn: October 1, 2024
 - 2. Bid Package B – Pedestrian Bridge Repair: August 16, 2024
- B. Work shall be Substantially Completed by the dates indicated below (**confirm in writing or fill out section 2.08 below**).
 - 1. Bid Package A – Bus Barn _____
 - 2. Bid Package B – Pedestrian Bridge Repair _____

2.08 LEAD TIMES ISSUES W/ POTENTIAL IMPACT TO PROJECT SCHEDULE

- A. All Bidders must indicate any known products/materials lead time issues that will impact the project timeline. Lead times are to be listed for each product/material, including estimated product delivery date. If no lead time issues are expected, bidders must simply indicate “Not applicable” or N/A. This indicates no known product/material lead time issues for the project schedule.

Product/material _____ Delivery Date _____

Product/material _____ Delivery Date _____

- B. If lead time issues are indicated above, provide an alternate substantial completion date for the bid package **to replace the listed substantial completion date indicated in 2.07 above.**

Bid Package A. Proposed new substantial completion date _____.

Bid Package B. Proposed new substantial completion date _____.

All Bidders must fill out either section 2.07 or 2.08 above.

2.09 IDENTIFICATION OF SUBCONTRACTORS

- A. HVAC
Subcontractor _____
- B. Plumbing
Subcontractor _____
- C. Electrical
Subcontractor _____
- D. Earthwork
Subcontractor _____
- E. Site Utility
Subcontractor _____

2.10 INSURANCE

- A. The undersigned agrees to provide Liability Insurance, Workmen's Compensation Insurance, Employer's Liability, as required by applicable Federal, State, and Local Laws, and in the amounts specified. Certificates shall be filed with the Owner prior to commencement of the Work.

2.11 TAXES

- A. The undersigned certifies that all of the prices stated above DO NOT include IOWA State Sales and Use Tax.

2.12 BID FORM SIGNATURE(S)

The Corporate Seal of

(Bidder - print the full name of your firm)

(Authorized signing officer, Title)

Signed and sealed this ____ day of _____, 2023.

Legal Classification: The undersigned does hereby declare that the Proposer has the legal status checked below:

- 1. ____ Individual
- 2. ____ Co-Partnership
- 3. ____ Corporation Incorporated under the Laws of the State of Iowa.

END OF BID FORM

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Bidder Status Form

To be completed by all bidders

Part A

Please answer "Yes" or "No" for each of the following:

- Yes No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).
- Yes No My company has an office to transact business in Iowa.
- Yes No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.
- Yes No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.
- Yes No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders

Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

City, State, Zip: _____

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

City, State, Zip: _____

Dates: ____ / ____ / ____ to ____ / ____ / ____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders

Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

2. Does your company's home state or foreign country offer preferences to resident bidders, resident labor force preferences or any other type of preference to bidders or laborers? Yes No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

You may attach additional sheet(s) if needed.

To be completed by all bidders

Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156. This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

- Yes No My business is currently registered as a contractor with the Iowa Division of Labor.
- Yes No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.
- Yes No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.
- Yes No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.
- Yes No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.
- Yes No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.
- Yes No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.
- Yes No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.
- Yes No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.
- Yes No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.
- Yes No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

SECTION 00 52 00

FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR

AIA Document A101 – Standard Form of Agreement Between Owner and Contractor, 2017 Edition shall be utilized for this project and is hereby a part of the Specifications and Contract Documents as if it were bound herein.

Copies of the document can be obtained through the American Institute of Architects, Iowa Chapter, 1000 Walnut Street, Suite 101, Des Moines, IA 50309, Phone (515) 244-7502, and are on file at the Office of the Architect for review.

END OF SECTION

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SECTION 00 61 13

PERFORMANCE AND PAYMENT BOND

AIA Document A312 – Performance and Payment Bond, 1984 Edition shall be utilized for this project and is hereby a part of the Specifications and Contract Documents as if it were bound herein.

Copies of the document can be obtained through the American Institute of Architects, Iowa Chapter, 1000 Walnut Street, Suite 101, Des Moines, IA 50309, Phone (515) 244-7502, and are on file at the Office of the Architect for review.

END OF SECTION

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AIA[®] Document A201[™] – 2017

General Conditions of the Contract for Construction

for the following PROJECT:

(Name and location or address)

2024 Facility Improvements
Rock Rapids, Iowa

THE OWNER:

(Name, legal status and address)

Central Lyon Community School District
Rock Rapids, Iowa

THE ARCHITECT:

(Name, legal status and address)

FEH
DEISGN
Sioux City, Iowa

TABLE OF ARTICLES

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- 14 TERMINATION OR SUSPENSION OF THE CONTRACT**

ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503[™], Guide for Supplementary Conditions.

15 CLAIMS AND DISPUTES

Int.

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User Notes:

(3B9ADA2D)

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ARTICLE 1 GENERAL PROVISIONS

§ 1.1 Basic Definitions

§ 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

§ 1.1.2 The Contract

The Contract Documents form the Contract for Construction. The Contract represents the entire and integrated agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

§ 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

§ 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

§ 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

§ 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

§ 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

§ 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

§ 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent

consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

§ 1.2.1.1 The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

§ 1.2.2 Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

§ 1.2.3 Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

§ 1.3 Capitalization

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

§ 1.4 Interpretation

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service

§ 1.5.1 The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

§ 1.5.2 The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

§ 1.6 Notice

§ 1.6.1 Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

§ 1.6.2 Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

§ 1.7 Digital Data Use and Transmission

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™-2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

§ 1.8 Building Information Models Use and Reliance

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

ARTICLE 2 OWNER

§ 2.1 General

§ 2.1.1 The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

§ 2.1.2 The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

§ 2.2 Evidence of the Owner's Financial Arrangements

§ 2.2.1 Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

§ 2.2.2 Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

§ 2.2.3 After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

§ 2.2.4 Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

§ 2.3 Information and Services Required of the Owner

§ 2.3.1 Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements,

assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

§ 2.3.2 The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

§ 2.3.3 If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

§ 2.3.4 The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

§ 2.3.5 The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

§ 2.3.6 Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

§ 2.4 Owner's Right to Stop the Work

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

§ 2.5 Owner's Right to Carry Out the Work

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

ARTICLE 3 CONTRACTOR

§ 3.1 General

§ 3.1.1 The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

§ 3.1.2 The Contractor shall perform the Work in accordance with the Contract Documents.

§ 3.1.3 The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor.

§ 3.2 Review of Contract Documents and Field Conditions by Contractor

§ 3.2.1 Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.

§ 3.2.2 Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

§ 3.2.3 The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

§ 3.2.4 If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

§ 3.3 Supervision and Construction Procedures

§ 3.3.1 The Contractor shall supervise and direct the Work, using the Contractor's best skill and attention. The Contractor shall be solely responsible for, and have control over, construction means, methods, techniques, sequences, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

§ 3.3.2 The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

§ 3.3.3 The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

§ 3.4 Labor and Materials

§ 3.4.1 Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services necessary for proper execution and completion of the Work, whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

§ 3.4.2 Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

§ 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

§ 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

§ 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

§ 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

§ 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

§ 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

§ 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the

Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

§ 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

§ 3.12 Shop Drawings, Product Data and Samples

§ 3.12.1 Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

§ 3.12.2 Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

§ 3.12.3 Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

§ 3.12.4 Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

§ 3.12.5 The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

§ 3.12.6 By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

§ 3.12.7 The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

§ 3.12.8 The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

§ 3.12.9 The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

§ 3.12.10 The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

§ 3.12.10.1 If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

§ 3.12.10.2 If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

§ 3.13 Use of Site

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

§ 3.14 Cutting and Patching

§ 3.14.1 The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

§ 3.14.2 The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

§ 3.15 Cleaning Up

§ 3.15.1 The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

§ 3.15.2 If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

§ 3.16 Access to Work

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

§ 3.17 Royalties, Patents and Copyrights

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

§ 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

ARTICLE 4 ARCHITECT

§ 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

§ 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the

Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

§ 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations

and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

ARTICLE 5 SUBCONTRACTORS

§ 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

§ 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

§ 5.3 Subcontractual Relations

By appropriate written agreement, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor,

prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

§ 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.

When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

ARTICLE 6 CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

§ 6.1 Owner's Right to Perform Construction and to Award Separate Contracts

§ 6.1.1 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

§ 6.2 Mutual Responsibility

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work,

promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

§ 6.3 Owner's Right to Clean Up

If a dispute arises among the Contractor, Separate Contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish, the Owner may clean up and the Architect will allocate the cost among those responsible.

ARTICLE 7 CHANGES IN THE WORK

§ 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

§ 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

§ 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

§ 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will

affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

ARTICLE 8 TIME

§ 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

§ 8.1.4 The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

§ 8.2 Progress and Completion

§ 8.2.1 Time limits stated in the Contract Documents are of the essence of the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

§ 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

ARTICLE 9 PAYMENTS AND COMPLETION

§ 9.1 Contract Sum

§ 9.1.1 The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

§ 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and

unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

§ 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.

§ 9.3.1.2 Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

§ 9.3.2 Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

§ 9.3.3 The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

§ 9.4 Certificates for Payment

§ 9.4.1 The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

§ 9.4.2 The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

§ 9.5 Decisions to Withhold Certification

§ 9.5.1 The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;
- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

§ 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

§ 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

§ 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

§ 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

§ 9.9.3 Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

§ 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

- § 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from
- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
 - .2 failure of the Work to comply with the requirements of the Contract Documents;
 - .3 terms of special warranties required by the Contract Documents; or
 - .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

§ 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

§ 10.2 Safety of Persons and Property

§ 10.2.1 The Contractor shall take reasonable precautions for safety of, and shall provide reasonable protection to prevent damage, injury, or loss to

- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

§ 10.2.2 The Contractor shall comply with, and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities, bearing on safety of persons or property or their protection from damage, injury, or loss.

§ 10.2.3 The Contractor shall implement, erect, and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards; promulgating safety regulations; and notifying the owners and users of adjacent sites and utilities of the safeguards.

§ 10.2.4 When use or storage of explosives or other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel.

§ 10.2.5 The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

§ 10.2.6 The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

§ 10.2.7 The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

§ 10.2.8 Injury or Damage to Person or Property

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

§ 10.3 Hazardous Materials and Substances

§ 10.3.1 The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

§ 10.3.2 Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

§ 10.3.3 To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

§ 10.3.4 The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

§ 10.3.5 The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

§ 10.3.6 If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

§ 10.4 Emergencies

In an emergency affecting safety of persons or property, the Contractor shall act, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 15 and Article 7.

ARTICLE 11 INSURANCE AND BONDS

§ 11.1 Contractor's Insurance and Bonds

§ 11.1.1 The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

§ 11.1.2 The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

§ 11.1.3 Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

§ 11.1.4 **Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

§ 11.2 Owner's Insurance

§ 11.2.1 The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

§ 11.2.2 **Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

§ 11.2.3 **Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

§ 11.3 Waivers of Subrogation

§ 11.3.1 The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

§ 11.3.2 If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

§ 11.5 Adjustment and Settlement of Insured Loss

§ 11.5.1 A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

§ 11.5.2 Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

ARTICLE 12 UNCOVERING AND CORRECTION OF WORK

§ 12.1 Uncovering of Work

§ 12.1.1 If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

§ 12.1.2 If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to

the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

§ 12.2 Correction of Work

§ 12.2.1 Before Substantial Completion

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

§ 12.2.2 After Substantial Completion

§ 12.2.2.1 In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

§ 12.2.2.2 The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

§ 12.2.2.3 The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

§ 12.2.3 The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

§ 12.2.4 The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

§ 12.2.5 Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

§ 12.3 Acceptance of Nonconforming Work

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

ARTICLE 13 MISCELLANEOUS PROVISIONS

§ 13.1 Governing Law

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

§ 13.2 Successors and Assigns

§ 13.2.1 The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

§ 13.2.2 The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

§ 13.3 Rights and Remedies

§ 13.3.1 Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

§ 13.3.2 No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

§ 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

§ 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

§ 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

§ 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance,

the Contractor shall pay the difference to the Owner. The amount to be paid to the Contractor or Owner, as the case may be, shall be certified by the Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

§ 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

§ 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;
- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

§ 14.4.3 In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

ARTICLE 15 CLAIMS AND DISPUTES

§ 15.1 Claims

§ 15.1.1 Definition

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

§ 15.1.2 Time Limits on Claims

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

§ 15.1.3 Notice of Claims

§ 15.1.3.1 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

§ 15.1.3.2 Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

§ 15.1.4 Continuing Contract Performance

§ 15.1.4.1 Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

§ 15.1.4.2 The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

§ 15.1.5 Claims for Additional Cost

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

§ 15.1.6 Claims for Additional Time

§ 15.1.6.1 If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

§ 15.1.6.2 If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

§ 15.1.7 Waiver of Claims for Consequential Damages

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

§ 15.2 Initial Decision

§ 15.2.1 Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

§ 15.2.2 The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the

Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

§ 15.2.3 In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

§ 15.2.4 If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

§ 15.2.5 The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

§ 15.2.6 Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.

§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

§ 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

§ 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

§ 15.4.4 Consolidation or Joinder

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.

SECTION 00 73 00

SUPPLEMENTARY GENERAL CONDITIONS

PART 1 GENERAL

1.01 SUMMARY

- A. These Supplementary General Conditions amend and supplement the General Conditions defined in Document 00 72 13 - General Conditions and other provisions of the Contract Documents as indicated below. Provisions that are not so amended or supplemented remain in full force and effect.
- B. The terms used in these Supplementary General Conditions that are defined in the General Conditions have the meanings assigned to them in the General Conditions.

1.02 RELATED SECTIONS

- A. Section 00 50 00 - Contracting Forms and Supplements.
- B. Section 01 42 16 - Definitions.

1.03 MODIFICATIONS TO GENERAL CONDITIONS

- A. Article 1: General Provisions
 - 1. Change Paragraph 1.1 as follows:
 - a. 1.1.1 The Contract Documents
 - 1) Delete the last sentence of Paragraph 1.1.1 and replace with the following:
 - a) The Contract Documents also include the bidding requirements (Notice to Bidders and Instruction to Bidders). Unless specifically enumerated in the agreements, the Contract Documents do not include sample forms and the Contractor's Bid Form. The Contract Documents executed or identified in accordance with Subparagraph 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.
 - b. 1.1.2 The Contract
 - 1) Create subparagraph 1.1.2.1
 - a) The Contract Documents shall be signed by the Owner and Contractor. If either the Owner or Contractor or both do not sign all the Contract Documents, the Architect shall identify such unsigned Documents. No Contract shall be formed between parties until all Contract Documents are executed by both parties.
 - c. Modify the second sentence in Section 1.1.8 to read as follows:
 - 1) "The Initial Decision Maker shall not be liable for results of interpretations or decisions rendered in good faith."

- d. Add Section 1.1.9:
 - 1) Terms: The terms indicated below shall be defined as having the meanings assigned to them as follows:
 - .1 Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work. Products may also include existing materials or components required for reuse.
 - .2 Furnish: To supply and deliver, unload, inspect for damage.
 - .3 Install: To unpack, assemble, erect, apply, place, finish, cure, protect, clean, and make ready for use.
 - .4 Provide: To furnish and install.
 - .5 Substitute the word >Architect/Engineer= for >Architect= each time the latter word appears.
 - 2. Add the following sentences to the end of Section 1.2.1:
 - a. In the case of an inconsistency between Drawings and Specifications, or within either Document itself, not clarified by Addendum, the better quality or greater quantity of Work shall be provided in accordance with the Architect's interpretation. In any case of discrepancy, the facts are to be brought to the attention of the Architect for a decision or interpretation.
 - 3. Add Section 1.2.4
 - a. Sections of Division 1 - General Requirements govern the execution of the Work of all sections of the specifications.
 - 4. Add Paragraph 1.4.1 to Paragraph 1.4:
 - a. 1.4.1 In the event of conflict among the various provisions of the Contract Documents, the terms shall be interpreted in the following order of propriety:
 - 1) Modifications to the Contract
 - 2) The Contract
 - 3) Special Conditions
 - 4) General Conditions
 - 5. Section 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service
 - a. Delete Section 1.5.1 and substitute the following:
 - 1) Design Documents or other Instruments of Service are the Architect's/Engineer's exclusive property. Architect/Engineer retains all common law, statutory and other reserved rights in the Design Documents or other Instruments of Service, including all copyrights in and to Design Documents and other Instruments of Service. Contractor, Subcontractors, Sub-subcontractors, and material or equipment suppliers shall not own or claim copyright of Design Documents or other Instruments of Service. Submittal or distribution to meet official regulatory requirements, or for other purposes in connection with Project are not to be

construed as publication in derogation of the Architect's/Engineer's reserved rights.

6. 1.7 Digital Data Use and Transmission

a. Delete Section 1.7.1 and substitute the following:

- 1) The Architect/Engineer may furnish to the Contractor versions of Instruments of Service in electronic form. The Contract Documents executed or identified in accordance with Subparagraph 1.5.1 shall prevail in case of an inconsistency with subsequent versions made through manipulatable electronic operations involving computers.

B. Article 2: Owner

1. Delete Sections 2.1.2 and 2.2.

2. 2.3 Information and Services Required Of The Owner

a. Modify Section 2.3.3 to read as follows:

- 1) If the employment of the Architect terminates, the Owner shall employ a successor whose status under the Contract Documents shall be that of the Architect.

b. Add the following language to the end of Paragraph 2.3.4:

- 1) The Contractor shall compare information furnished by the Owner (including surveys and soil tests with observable physical conditions) and the Contract Documents and on the basis of such review, shall report to the Owner and Architect any conflicts, errors or omissions. Contractor shall be responsible for any additional costs, delays and damages resulting from the Contractor's failure to immediately report any such errors, inconsistencies or omissions.

c. Delete Section 2.3.6 and substitute the following:

- 1) The Owner will furnish the Contractor, free of charge, as many copies of Contract Documents as can be allocated for this use from quantities returned by Bidders. Contractor may purchase additional copies at the cost of reproduction, postage, and handling.

3. Change Paragraph 2.5 by deleting the current language and replacing with the following:

a. Create subparagraph 2.5.1

- 1) If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents, and fails within a seven (7) day period, or such shorter time period as may be reasonable under circumstances, after receipt of written notice from the Owner to the Contractor, to commence and continue correction of such default or neglect with diligence and promptness, the Owner may notify the Surety and request it to assume the obligations of the Contractor within seven (7) days following receipt by Contractor and Surety of written notice or the Owner may, without prejudice to any other remedies the Owner may have, correct such deficiencies. In such case an appropriate Change Order or Construction Change Directive shall be issued deducting from the payments then or thereafter due the

Contractor, the cost of correction of such deficiencies, including reasonable attorney's fees and compensation for the Architect/Engineer's additional services incurred as result of such default, neglect or failure. Such action by Owner, and amounts charged to the Contractor are both subject to prior concurrence with Architect/Engineer. If current or future payments thereafter due Contractor are not sufficient to cover such amounts, Contractor, or Surety, shall pay difference to Owner.

C. Article 3: Contractor

1. Add the following at the end of Paragraph 3.1.1:
 - a. Contractor shall at request of Owner prior to execution of Agreement and promptly from time to time as requested by the Owner, thereafter furnish Owner an update and current financial statement and/or Contractor Qualification Statement on AIA Document A305.
2. Add Sub-paragraph 3.1.2.1 as follows:
 - a. 3.1.2.1 The Contractor shall supervise and direct Work in excellent and workmanlike manner, complete the work and everything properly incidental thereto as stated in the Project Manual and Drawings or reasonably implied therefrom and otherwise in accordance with Contract Documents.
3. Add at the end of Paragraph 3.1.3 as follows:
 - a. The Contractor shall not be relieved of its obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract, or by tests, inspections or approvals required or performed by persons or entities other than the Contractor. To the extent permitted by law, the Contractor waives any rights, claims, or causes of action against Owner as a result of activities or duties or intentional or negligent misconduct by the Architect in the Architect's administration of the Contract, or representations made by Architect/Engineer in Instruments of Service.
4. 3.2 Review Of Contract Documents and Field Conditions By Contractor
 - a. Add the following new language to the end of Paragraph 3.2.1:
 - 1) The Contractor also represents that all Contract Documents for the Project have been examined; including those intended for work of trades not normally performed by the Contractor's own forces, and that it has become thoroughly familiar with all conditions which may pertain to or affect the Work under the Contract.
 - b. Add the following language to Paragraph 3.2.2.:
 - 1) Modify Section 3.2.2 to add the words:
 - a) including any ordering of materials' in line two after the word "Work".
 - 2) Any costs associated with Contractor's failure to immediately notify the Architect and the Owner of items listed above shall be borne by the Contractor.

- c. Delete Section 3.2.3 and substitute the following:
 - 1) 3.2.3 The Contractor must take field measurements and verify Site conditions, and must carefully compare such field measurements and Site conditions and other information known to the Contractor with the Contract Documents, before ordering any material or doing any Work at the Site.
- d. Delete Section 3.2.4 and substitute the following:
 - 1) Contractor shall make frequent inspections during progress of Work to confirm that Work previously performed by Contractor is in compliance with Contract Documents and applicable laws and regulations bearing on performance of Work and Referenced Standards and that portion of Work previously performed by Contractor or by others are in proper condition to receive subsequent Work.
- e. Add the following Paragraphs 3.2.5 - 3.2.8 to Section 3.2:
 - 1) 3.2.5 If the Contractor believes that any portions of the Contract Documents do not comply with applicable laws, statutes, ordinances, building codes, and rules and regulations, or any orders by code enforcement officials or the Owner or its designee acting in the capacity of building code inspectors or Referenced Standards, the Contractor must promptly notify the Owner and the Architect of the non-compliance as provided in Section 3.2.6 and request direction before proceeding with the affected Work.
 - 2) 3.2.6 Contractor shall promptly notify Owner and Architect/Engineer in writing of any apparent errors, inconsistencies, omission, ambiguities, construction impracticalities or code violations discovered as result of Contractor's review of Contract Documents including any differences between actual and indicated dimensions, locations and descriptions, and shall give Owner and Architect/Engineer timely notice in writing of same and any corrections, clarifications, additional Drawings or Specifications, or other information required to define Work in greater detail or to permit proper progress of Work. Contractor shall provide similar notice with respect to any variance between its review of Site and physical data and Site conditions observed.
 - 3) 3.2.7 If Contractor performs any Work involving an apparent error, inconsistency, ambiguity, construction impracticality, omission or code violation in Contact Documents of which Contractor is aware, or which could reasonably have been discovered by review required by Section 3.2, without promptly written notice to Owner and Architect/Engineer and request for correction, clarification or additional information, as appropriate, Contractor does so at its own risk and expense and all claims relating thereafter are specifically waived.

- 4) 3.2.8 The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect/Engineer for evaluating and responding to the Contractor's requests for information that are not prepared in accordance with the Contract Documents or where the requested information is available to the Contractor from a careful study and comparison of the Contract Documents, field conditions, or other Owner-provided information, Contractor-prepared coordination drawings, or prior Project correspondence or documentation.
5. Change Section 3.3.1 to add the word "written" between the words "timely" and "notice" in line 7.
6. Add Section 3.3.4 as follows:
 - a. The Contractor acknowledges that it is Contractor's responsibility to hire all personnel for the proper and diligent prosecution of the Work and the Contractor shall use its best efforts to maintain labor peace for the duration of the Project. In the event of a labor dispute, the Contractor shall not be entitled to any increase in the Contract Sum.
7. Change Paragraph 3.4.1 to read as follows:
 - a. 3.4: Labor and Materials
 - 1) Add the following new language to the end of Paragraph 3.4.1:
 - 2) Work required by the Contract Documents to be performed after working hours or work the Contractor elects to perform after hours shall be completed at no additional cost to the Owner.
8. Add Section 3.4.2 as follows:
 - a. Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.
 - b. Add Sections 3.4.2.1, 3.4.2.2 and 3.4.2.3 to Section 3.4.2:
 - 1) 3.4.2.1 After the Contract has been executed, the Architect, Owner, and Contractor shall function as a team to evaluate, review and consider substitution of products in place of those specified under the conditions set forth by the Architect.
 - 2) 3.4.2.2 After the Contract has been executed, the Owner and Architect/ Engineer may consider requests for the substitution of products in place of those specified. The Owner and Architect/Engineer may, but are not obligated to, consider only those substitution requests that are in full compliance with the conditions set forth in the General Requirements (Division 1 of the Specifications). By making requests for substitutions, the Contractor:
 - .1 represents that it has personally investigated the proposed substitute product and determined that it is equal or superior in all respects to that specified;

.2 represents that it will provide the same warranty for the substitution as it would have provided for the product specified;

.3 certifies that the cost data presented is complete and includes all related costs for the substituted product and for Work that must be changed as a result of the substitution, except for the Architect/ Engineer's redesign costs, and waives all claims for additional costs related to the substitution that subsequently become apparent; and

.4 Agrees that it shall, if the substitution is approved, coordinate the installation of the accepted substitute, making such changes as may be required for the Work to be complete in all respects.

- 3) 3.4.2.3 The Owner shall be entitled to reimbursement from the Contractor for amounts paid to the Architect/Engineer for reviewing the Contractor's proposed substitutions and making agreed-upon changes in the Drawings and Specifications resulting from such substitutions.

9. Add the following to the end of Section 3.4.3:

- a. Persons permitted to perform Work under Contractor or any Subcontractor or Sub-Subcontractor shall meet all employment eligibility, safety training, security or drug/alcohol testing requirements required by law or by Owner. Any person not complying with all such requirements shall be immediately removed from the site.

- b. Add Section 3.4.3.1 to Section 3.4.3:

- 1) The Contractor or its Subcontractors shall not be owned, operated, or managed by a registered sex offender who has been convicted of a sex offense against a minor in accordance with Iowa Code 692A.113. In addition, the Contractor or their Subcontractors shall not permit an employee who is a registered sex offender convicted of a sex offense against a minor on real property of the schools of the Owner in accordance with Iowa Code 692A.113. The Contractor and its Subcontractors shall further acknowledge and certify services provided under this Contract comply with Iowa Code 692A.113, and shall fully execute and deliver copies of Acknowledgment and Certification to the District prior to execution of Agreement.

10. Strike existing Paragraph 3.5.1 and replace with the following:

- a. 3.5.1 Contractor shall warrant to Owner that materials and equipment furnished under Contract will be of good quality and new unless otherwise required or permitted by Contract Documents, that workmanship will be free from defects not inherent in quality required or permitted, that workmanship will comply with all applicable laws, building codes, rules and regulations, and that workmanship will conform to requirements of Contract Documents.

11. Add the following Paragraphs to 3.5:
 - a. 3.5.3 The Contractor's general warranty and any additional or special warranties are not limited by the Contractor's obligations to specifically correct defective or nonconforming Work as provided in Article 12, or are they limited by any other remedies provided in the Contract Documents. The Contractor shall also be liable for any damage to property or persons (including death) including consequential and direct damages relating to any breach of the Contractor's general warranty or any additional or special warranties required by the Contract Documents.
 - b. 3.5.4 The Contractor shall furnish all special warranties required by the Contract Documents to the Owner no later than Substantial Completion. The Owner may require additional special warranties in connection with the approval of "Or-Equals" or Substitutions, Allowance items, Work that is defective or nonconforming, or the acceptance of nonconforming Work pursuant to Article 12.
 - c. 3.5.5 In case of work performed by Subcontractors and where warranties are required, secure warranties from said Subcontractors addressed to and in favor of the Owner. Deliver copies of same to Architect upon completion of work. Delivery of said warranties shall not relieve the Contractor from any obligations assumed under any other provision of contract.
12. Delete Section 3.6 text and add Sections 3.6.1 through 3.6.7 to Section 3.6:
 - a. 3.6.2 Iowa Sales Taxes shall not be paid on qualified building materials purchased, or withdrawn from inventory, which will be incorporated into real property for Project.
 - b. 3.6.3 The Owner is a designated exempt entity and will complete an online application to register this Contract with the Iowa Department of Revenue and Finance. The Owner will distribute Tax Exemption Certificates and Authorization Letters to the Contractor and all Subcontractors who have been identified at, or before filing of the Performance Bond. Refer to Iowa Department of Revenue and Finance publications available at <http://www.state.ia.us/tax/business/Contr-ExEnt-Index.html>.
 - c. 3.6.4 At or before the time the Performance Bond is filed, Contractor shall provide a listing to the Owner identifying all Subcontractors. Listing shall indicate company name, address, telephone number, fax number, contact name, and Employer ID # for Contractor and each Subcontractor. Contractor and Subcontractors shall make copies of the Tax Exemption Certificate and provide to each supplier providing construction material, a copy of the Tax Exemption Certificate. This Certificate will allow the Contractor and Subcontractors to purchase qualified building materials free from sales tax for the Project. The Tax Exemption Certificate and Authorization Letter have been developed exclusively for this purpose and are applicable only for the specific Project under this Contract.

- d. 3.6.5 Contractor shall be responsible for informing themselves of tax laws, requirements, regulations, and interpretations as they apply to this Project.
 - e. 3.6.6 Contractor shall maintain all records, invoices, receipts, or other accounting data regarding material purchases and shall allow, upon written request of Owner, and within reasonable time frame after receipt of such request, Owner to audit such records to verify tax savings. If audit reveals taxes paid or savings not transferred to Owner, Contractor shall be liable to Owner for those amounts and Owner may back charge Contractor for those amounts if balance of funds due and payable remains at time of such discovery.
 - .1 Contractor shall require all Subcontractors of any tier to maintain all records, invoices, receipts, or other account data regarding material purchases. Contractor shall collect such records with each application for payment if receives from its Subcontractors and shall maintain such records in same manner and location as Contractor's records.
 - .2 Contractor shall ensure its Subcontractors and any lower-tier Subcontractors including these obligations in their contracts and bind themselves in same manner as Contractor is bound to Owner.
13. Change Section 3.7 as follows:
- a. Delete Section 3.7.1 and substitute the following:
 - 1) 3.7.1 Unless otherwise specified in the Contract Documents, the Contractor shall secure and pay for the building permit and other permits and governmental fees, licenses, and inspections, including storm water permits, necessary for proper execution and completion of the Work which are legally required when bids are received or negotiations concluded. If applicable, Contractor shall file Notice of Intent for NPDES Coverage Under General Permit, file and implement Storm Water Pollution Prevention Plan (SWPPP), maintain pollution prevention devices, and file Notice of Discontinuation upon stabilization of site for storm water run-off associated with Project. Refer to Iowa Department of Natural Resources publications regarding storm water management; available at <http://www.iowadnr.com/water/stormwater/forms.html> or call 515-281-7017 for filing requirements. Contractor shall also pay for governmental inspection fees associated with Storm Water Pollution Prevention Plan.
 - b. Delete Paragraph 3.7.3 and replace as follows:
 - 1) 3.7.3 If the Contractor, or any of its Subcontractors, performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

- c. Modify Section 3.7.4 as follows:
 - 1) Add the words “, in writing,” in line 11 after the word “Contractor.”
 - 2) Add the following before the last line: “Failure to properly register a claim within the 21 day period shall be grounds for denial of the claim.”
- d. Modify subparagraph 3.7.5 to read as follows:
 - 1) Add the words “knowingly” and “and recognizes” on each side of the word “encounters” in the first sentence and add the words “or good faith belief of such existence” between the words “existence” and “of” in the last sentence.
- e. Add the following new Paragraph 3.7.6:
 - 1) The Contractor is responsible for scheduling inspections related to the performance of its Work and ensuring Work is complete for inspections. Any costs associated with re-inspections caused by irregularities, deficiencies or non-conforming Work will be borne by the responsible contractor including all Architectural and Engineering Services related to evaluation of the problem and development of an acceptable solution.
- f. Add the following new Paragraph 3.7.7:
 - 1) The Contractor shall take note and comply with all governing laws, rules, and regulations affecting the Work. This may include, but is not limited to, such laws, rules, and regulations as:
 - .1 Licensing of Contractors for special requirements, eg. hazardous waste removal.
 - .2 Requirements for special construction permits.
 - .3 Exemption from sales tax, if applicable.
 - .4 Wage rates and employment requirements when required by law or by Owner.
 - .5 Local labor requirements.
 - .6 Non-discriminatory hiring practices.
- g. Add the following new Paragraph 3.7.8:
 - 1) State of Iowa, its agencies, and its political subdivisions, including cities, school districts and public utilities are required by Iowa Code 73A.21 to require reciprocal resident bidder and resident labor force preference.
 - 2) Add the following new Paragraph 3.7.8.1:
 - a) Resident Bidder: means person or entity authorized to transact business in State of Iowa and having place of business for transacting business with state at which it is conducting and has conducted business for at least three (3) years prior to date of first advertisement for public improvement. If another state or foreign country has more stringent definition of Resident Bidder, more stringent definition shall be applicable as to bidders from that state or foreign country.
 - 3) Add the following new Paragraph 3.7.8.2:
 - a) Resident Bidder shall be allowed preference against nonresident bidder from state or foreign country other than

Iowa if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including, but not limited to, any preference to bidders, the imposition of any type of force preference, or any other form of preferential treatment to bidders or laborers from state or foreign country. Preference allowed shall be equal to preference given or required by state or foreign country in which nonresident bidder is resident.

- 4) Add the following new Paragraph 3.7.8.3:
 - a) If Contractor is a nonresident bidder, Contractor is required to specify in the Agreement between Owner and Contractor, whether any preference is in effect in nonresident bidder's state or country at time of this bid and identify source of regulations.
14. Change Paragraph 3.9 to read as follows:
 - a. Delete subparagraph 3.9.1 and replace with the following:
 - 1) The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site at all times during performance of the Work, including work of the Contractor's subcontractors. Any change in superintendent personnel must be approved by the Owner. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor. Other communications shall be similarly confirmed on written request in each case. This individual shall be fluent in all languages necessary to communicate with Contractor's employees. Owner shall be furnished with the e-mail address and cell phone numbers for the Superintendent. The approved superintendent will work in this position until completion of the Work unless the superintendent shall no longer be in the Contractor's employ, or shall be released at the request of the Architect and/or Owner.
 - b. Delete subparagraph 3.9.2 and replace with the following:
 - 1) The Contractor shall, within three (3) business days of the Owner's notification of an intent to award the Contract, submit to the Owner, and Architect/Engineer, the name and qualifications of the proposed superintendent(s) for review and approval. Within fourteen (14) days of receipt of the information, the Architect shall notify the Contractor whether the Owner or Architect has reasonable objection to the proposed superintendent. When the superintendent(s) are approved, they shall not be removed without the Owner's written approval which will not be unreasonable withheld. The responsibility of the superintendent is to supervise, schedule, coordinate, and manage field operations.

- c. Add subparagraph 3.9.3.1 as follows:
 - 1) The Superintendent or Superintendents shall be thoroughly competent with full experience in all phases of the Work to be performed under this Contract. Anyone not deemed capable of directing all trades involved in the Work shall be replaced or supplemented immediately upon request, by someone who is satisfactory. After a satisfactory superintendent has been assigned, they shall not be withdrawn without the consent of the Architect and/or Owner.
- 15. Change Paragraph 3.10 as follows:
 - a. 3.10: Contractor's Construction Schedules
 - 1) Delete Sections 3.10.1 and 3.10.2 and substitute the following:
 - a) Section 3.10.1:
 - 1. The Contractor, within ten (10) days of award of Contract, shall prepare and submit in its native electronic and graphic format, Owner's and Architect/Engineer's approval Contractor's baseline construction schedule for Work. Schedule shall not exceed time limits current under Contract Documents, shall be revised at appropriate intervals as required by conditions of Work and Project, shall be related to entire Project to extent required by Contract Documents, or as requested by Owner or Architect/Engineer, and shall provide for expeditious and practicable execution of Work. Schedule at minimum shall demonstrate rate of work (ROW), availability dates, permits, submittals, working drawings, procurement, fabrication, delivery of materials, construction, and other activities necessary to complete Work. Thereafter, Contractor shall prepared and update construction schedule on at least a monthly basis a current Construction Schedule, if not more frequently at Owner's or Architect's request, to be submitted to Owner in graphic and native electronic format with each Application for Payment. Each update shall include narrative including:
 - .1 Description of status of schedule.
 - .2 Discussion of current and anticipated delays.
 - .3 Discussion of progress of critical path activities.
 - .4 Discussion of critical path for remainder of project.
 - .5 Listing and discussion of logic changes and duration changes.
 - b) Section 3.10.2:
 - 1. Contractor shall prepare submittal schedule within fourteen (14) days after being awarded Contract and thereafter as necessary to maintain current submittal schedule. The Contractor shall submit schedule(s) for

Architect/Engineer's approval. Architect/Engineer's approval shall not unreasonably be delayed or withheld. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals. Submittal schedule shall:

.1 be coordinated with Contractor's construction schedule, and;

.2 allow Architect/Engineer reasonable time to review submittals.

2) Add subparagraph 3.10.4 as follows:

a) The Contractor shall furnish information concerning the Work. This information will include, but not be limited to the following:

1. Daily: Manpower by craft.

2. Weekly: Two week look ahead schedule update. Delivery requirements and status of materials.

3. Monthly: Written report including schedule update as outlined above and cost information.

16. Delete Section 3.11 text and substitute the following:

a. Contractor shall maintain at site for Owner one copy of Drawings, Specifications, Addenda, Current Construction Schedule, Change Orders and other Modifications, in good order and marked currently to indicate field and similar required submittals. Contractor shall display current Construction Schedule at site for reference and reliance by Owner and Architect/Engineer. These shall be available to Architect/Engineer and shall be delivered to Architect/Engineer for submittal to Owner upon completion of Work as record of Work as constructed.

17. Change Paragraph 3.12 as follows:

a. Add the following to the end of Paragraph 3.12.5: "The Contractor shall provide the Owner and the Architect with copies of all submittals made to regulatory agencies.

b. Add the following at end of Section 3.12.7:

1) Contractor shall correct at their cost, and without any adjustment in Contract time, any Work the correction of which is required due to Contractor's failure to obtain approval of submittal required to have been obtained prior to proceeding with Work, including, but not limited to, correction of any conflicts in Work resulting from such failure.

c. Delete subparagraph 3.12.8 and replace with the following:

1) The Work shall be in accordance with reviewed submittals except that the Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Architect's review of Shop Drawings, Product Data, Samples

or similar submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submittal and (1) the Architect has taken appropriate action relative to the specific deviation as a minor change in the work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omission in Shop Drawings, Product Data, Samples or similar submittals by the Architect's review thereof.

d. Modify Section 3.12.10.1 by adding the word “reasonably” before the word “rely” in line 4.

e. Add Section 3.12.11 to Section 3.12:

- 1) The Architect/Engineer’s and Consultant’s review of Contractor’s submittals will be limited to examination of an initial submittal and 1 resubmittal. Architect will notify the Contractor before beginning a further review that such review will result in additional cost to the Owner which can be charged back to Contractor. The Contractor shall reimburse the Owner for amounts paid to the Architect/Engineer for evaluation of additional resubmittals.

18. Change Paragraph 3.13 to read as follows:

a. 3.13: Use Of Site

1) Add the following new Paragraph 3.13.2:

- a) Contractor shall perform the Work so as to cause a minimum of inconvenience to and interruption of the Owner’s operations. Any and all interruptions of the operations of the Owner necessary for the performance of the Work shall be noted in the progress schedule and the Contractor shall additionally give the Owner sufficient advance notice of such interruption as to allow the Owner to adjust operations accordingly. Contractor’s failure to give the Owner timely notice of such intentions shall place the responsibility of any resulting delays or additional costs solely with the Contractor.

2) Add the following new Paragraph 3.13.3:

- a) Except as may be specifically provided in the Contract Documents, the Contractor shall provide all necessary temporary facilities, including power, water, sanitation, scaffolding, storage, and security. If Owner makes any such facilities available to Contractor, it is without representation or warranty as to their adequacy for Contractor’s use, and Contractor shall indemnify, defend, and hold Owner harmless from and against any claims arising out of Contractor’s use of such facilities.

3) Add the following new Paragraph 3.13.4:

- a) The Contractor shall not bring or permit any subcontractor, supplier or anyone else for whom the Contractor is responsible, to bring on the site any asbestos, PCB’s

petroleum, hazardous waste or radioactive materials
(except for proper use in performing the Work).

19. Strike Paragraph 3.15.1 and 3.15.2 and replace with the following:

a. 3.15 CLEANING UP, WORKING HOURS AND NOISE ORDINANCE

- 1) 3.15.1 Work will be performed in accordance with the Contract Documents, the Applicable Building Code, and other applicable law governing the Contractor's performance of the Work. No delays resulting from compliance with applicable laws or regulations may form the basis for any claim by the Contractor for delay damages or additional compensation or for any extensions of the Contract Time. The Contractor must not permit work outside of hours established in the Contract Documents on a Saturday, Sunday or State or federal holiday without the written consent of the Owner, given after prior written notice to the Architect and any other applicable consultants; such consent, if given, may be conditioned upon payment by the Contractor of the Owner's, Architect's and any other applicable consultants' additional costs and fees, testing or regulatory agency costs incurred in monitoring such off-hours Work. The Contractor must notify the Owner as soon as possible if Work must be performed outside such times in the interest of the safety and protection of persons or property at the Site or adjacent thereto, or in the event of an emergency. In no event shall the Contractor permit Work to be performed at the Site without the presence of the Contractor's superintendent and person responsible for the protection of persons and property at the Site and compliance with all applicable laws and regulations, if different from the superintendent.
- 2) 3.15.2 The Contractor must comply with any applicable Noise Ordinances and any successor or substitute provisions covering the regulation of noise levels. It is the duty of the Contractor to familiarize itself with those provisions and perform the Work in compliance with those provisions.
- 3) 3.15.3 The Contractor must keep the Site and adjacent areas free from accumulation of waste materials or rubbish caused by operations under the Contract, and must keep tools, construction equipment, machinery and surplus materials suitably stored when not in use. If the Contractor fails to do so in a manner reasonably satisfactory to the Owner or the Architect within forty-eight (48) hours after notice or as otherwise required by the Contract Documents, the Owner may clean the Site and back charge the Contractor for all costs associated with the cleaning. The Contractor shall keep the premises and surrounding area free from accumulation of waste materials or rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery and surplus materials from and about the Project.

20. Article 4: Administration Of The Contract

a. Delete Section 4.1.1 and substitute the following:

- 1) The "Architect" is defined in this Contract as the Engineer or Architect lawfully licensed by the State to practice architecture or engineering or an entity, licensed by the State to lawfully practice architecture or engineering identified as such in this Contract and as is referred to throughout the Contract documents as if singular in number. The term "Engineer," "Architect/Engineer," "Engineer/Architect," "Architect's authorized representative," "Engineer's authorized representative," or "Architect/Engineer's authorized representative" shall mean "Architect" as defined in this paragraph.

b. Delete Paragraph 4.2.2. and replace with the following:

- 1) The Architect, as a representative of the Owner, shall attend construction meetings and visit the site while Work is in progress not less often than as outlined in the Contract between Owner and Architect, or as otherwise mutually agreed to by the parties, to observe and evaluate the site and the Work; to become familiar with the progress and quality of the Work; and to determine whether the Work evaluated and observed is proceeding in accordance with the Contract Documents and construction schedule and whether there are defects or deficiencies in the Work evaluated and observed. On the basis of on-site observations and evaluations, the Architect shall keep the Owner reasonably informed of the progress and quality of the Work and its conformance with the Construction Documents and the construction schedule. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for, the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents, except as provided in Section 3.3.1.

c. Add Section 4.2.2.1 to Section 4.2.2:

- 1) The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect/Engineer for site visits made necessary by the fault of the Contractor or by defects and deficiencies of the Work.

d. Delete Section 4.2.4 and substitute with the following:

- 1) Except as otherwise provided in the Contract Documents or when direct communications have been specially authorized, the Owner and Contractor shall include the Architect in communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any relevant direct communications between the Owner and the Contractor otherwise relating to the

Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

- 2) Add the following subparagraphs:
 - a) 4.2.4.1 All notices, demands, requests, instructions, approvals, proposals and claims must be in writing. Any notice or demand upon the Contractor shall be sufficiently given if delivered at the office of the Contractor stated on the signature page of the agreement (or at such other office as the contractor may from time to time designate in writing to the Owner), or if deposited in the United States mail in a sealed, postage-paid envelope or delivered with charges prepaid to any telegraph company for transportation, in each case addressed to such office.
 - b) 4.2.4.2 All papers required to be delivered to the Owner shall, unless otherwise specified in writing to the Contractor, be delivered to the office of FEH DESIGN, 1201 4th Street, Sioux City, IA 51101 and any notice to or demand upon the Owner shall be sufficiently given if so delivered, or if deposited in the United States mail in a sealed, postage prepaid envelope, or delivered with charges prepaid to any telegraph company for transmission to said Owner at such address, or to such other representatives of the Owner may subsequently specify in writing to the Contractor for such purpose.
 - c) 4.2.4.3 Any such notice shall be deemed to have been given as of the time of actual delivery of (in the case of mailing) when the same should have been received in due course of post, or in the case of telegrams, at the time of actual receipt, as the case may be.
- 3) Add Section 4.2.7.1 to Section 4.2.7:
 - a) In no case will the Architect/Engineer's review period on any submittal be less than fifteen (15) calendar days after receipt of the submittal from the Contractor.
- 4) Modify Section 4.2.12 to delete the words "will not show partiality to either."
- 5) Add Section 4.2.14.1 to Section 4.2.14:
 - a) Contractor's requests for information shall be prepared and submitted in accordance with Division 1 General Requirements sections on form acceptable to Architect/Engineer. The Architect/Engineer will return without action requests for information that does not conform to requirements of the Contract Documents.

21. Article 5: Subcontractors

- a. 5.2 Award of Subcontracts and other Contracts for Portions of the Work

- 1) Make the following changes to paragraph 5.2.1:
 - a) Replace the words "as soon as practicable" (line 1) with the words "within 10 days".
 - b) Add to the end of paragraph 5.2.1:
 1. A list of Subcontractors shall be submitted in duplicate on AIA Document G805, 2001 Edition. Contractor shall update this list throughout Project and keep Owner and Architect/Engineer advised of any new subcontractors employed.
- 2) 5.2.3 Add the following language to the end of subparagraph:
 - a) Acceptance or rejection of any subcontractor shall not relieve the Contractor of performance of Work as called for under the Contract Documents, nor shall acceptance of a particular subcontractor be construed as acceptance of any particular purpose or material.
- 3) Add Paragraph 5.2.5 Manufacturers and Fabricators:
 - a) Add subparagraph 5.2.5.1:
 1. Not later than thirty (30) days after the date of commencement of the Work, the Contractor shall furnish in writing to the Owner through the Architect/Engineer the names of persons or entities proposed as manufacturers or fabricators for certain products, equipment and systems identified in the General Requirements (Division 1 of the Specifications) and, where applicable the name of the installing Subcontractor. The Architect/Engineer may reply within fourteen (14) days to the Contractor in writing stating 1) whether the Owner or the Architect/Engineer has reasonable objection to any such proposed person or entity or 2) that the Architect/Engineer requires additional time to review. Failure of the Owner or Architect/Engineer to reply within the fourteen (14) day period shall constitute notice of no reasonable objection.
 - b) Add subparagraph 5.2.5.2:
 1. The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect/Engineer has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.
 - c) Add subparagraph 5.2.5.3:
 1. If the Owner or Architect/Engineer has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect/Engineer has no reasonable objection. If the proposed but rejected manufacturer or fabricator was reasonable capable of

performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute manufacturer's or fabricator's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

- d) Add subparagraph 5.2.5.4:
 - 1. The Contractor shall not substitute a person or entity previously selected if the Owner or Architect/Engineer makes reasonable objection to such substitution.
- 4) 5.4 Contingent Assignment of subcontractors:
 - a) Delete Paragraph 5.4.2 in its entirety.
- 22. Article 6: Construction by Owner or by Separate Contract
 - a. Add the following to the end of Paragraph 6.1.1:
 - 1)The Contractor shall give notification of the potential of a claim in writing to Owner and/or Separate Contractor within forty-eight (48) hours of the occurrence or discovery of the potential of an occurrence of the delay or action that will result in making a claim.
 - b. Delete the last sentence of Section 6.2.2 and insert the following to the end of section:
 - 1) , except as to defects not then reasonably discoverable.'
- 23. Article 7: Changes in the Work
 - a. Add the following to the end of Paragraph 7.1.1:
 - 1) No claim for an addition to the maximum Contract sum shall be considered a valid claim unless a written change order procedure is followed as outlined in this Section. Verbal authorization for changes must be supported by written approval before being considered valid.
 - b. Add the following Clauses to 7.1.2:
 - 1) 7.1.2.1 All changes in Material or Methods as described in the Plans and Specifications must have written approval by the Owner and Architect prior to incorporation in the Project.
 - 2) 7.1.2.2 All changes in the Plans and Specifications must be documented by a Change Order Form issued by the Architect & approved by the Owner.
 - 3) 7.1.2.3 Total adjustments in Contract Amount are to reflect a reasonable markup to reflect overhead and profit, not to exceed as follows:
 - 4) 7.1.2.3.1 Change executed by Subcontractor: 10% by Subcontractor for overhead and profit and 5% by Contractor for coordination and profit. Subcontractor and Sub-subcontractor's total aggregate shall not exceed ten percent (10%) percent of the cost.

- 5) 7.1.2.3.2 Change executed by Contractor without subcontractor involvement: 10% for overhead and profit.
 - 6) On Work deleted from the Contract, credit to the Owner shall be the Architect/Engineer approved net cost plus one-half ($\frac{1}{2}$) of the overhead and profit percentage noted above.
 - 7) 7.1.2.3.3 Contractor and Sub-contractors shall provide written detailed documentation for each (sub) contractor showing their time and materials on all changes submitted for review by the Architect unless pre-approved at a fixed amount. In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials and Subcontracts. Labor and materials shall be itemized in the manner described above. Where major cost items are Subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.
- c. Add the following subparagraph 7.2.2:
- 1) 7.2.2 The forms used to process a Change Order will include AIA Document G701, Change Order.
- d. Add the following subparagraph 7.2.3:
- 1) Contractor shall submit change proposals covering contemplated Change Order within ten (10) days after request of Owner, or Architect/Engineer or within ten (10) days after event giving rise to Contractor's claim for change in Contract Sum or Contract Time. No increase in Contract Sum or extension of Contract Time will be allowed Contractor for cost or time involved in making change proposals. Change proposals shall define or confirm in detail Work which is proposed to be added, deleted, or changes and shall include any adjustment which Contractor believes to be necessary in (i) Contract Sum, (ii) Contract time. Any proposed adjustment shall include detailed documentation including, but not limited to; cost, properly itemized and supported by sufficient substantiating data to permit evaluation including cost of labor, materials, supplies and equipment, rental cost of machinery and equipment, additional bond cost, plus fixed fee for profit and overhead (which includes office overhead and site-specific overhead and general conditions) of ten percent (10%) if Work is performed by Contractor, or five percent (5%) if Work is performed by Subcontractor or Sub-subcontractor. Subcontractors and Sub-subcontractors overhead and profit in turn shall not exceed total aggregate of ten percent (10%). Change proposals shall be binding upon Contractor and may be accepted or rejected by Owner at their discretion. Owner may, at their option, instruct Contractor to proceed with Work involved in change proposal in accordance with this section without accepting change proposal in its entirety.

- e. Add the following subparagraph 7.2.4
 - 1) If the Owner determines that a change proposal is appropriate, the Architect will prepare and submit a request for a Change Order or Contract Amendment providing for an appropriate adjustment in the Contract Sum or Contract Time, or both, for further action by the Owner. No such change is effective until the Owner and Architect sign the Change Order.
- f. Add the following to subparagraph 7.3.2:
 - 1) ,upon prior written approval of the Owner:”
- 24. Article 8: Time
 - a. Add the following new Clause to 8.1.1:
 - 1) 8.1.1.1 The project shall be substantially complete **by the date specified in these specifications.**
Contractor may, at Contractor's option, complete the project at an earlier date to be indicated on the Bid Form.
 - b. Add the following to the end of 8.1.2:
 - 1) or the date of the Notice To Proceed, whichever occurs later.”
 - c. Add the following paragraphs to 8.2:
 - 1) Add the following at end of 1st sentence of Section 8.2.2:
 - a) or prior to approval of Certificates of Insurance, and Additional Insured Endorsement and Notice of Cancellation Endorsement required to be submitted to Owner under Contract.
 - 2) 8.2.3 Add the following to the end of paragraph 8.2.3, “If Contractor’s Work shall fall behind schedule for reasons that are not excused under the terms of the Contract, Contractor shall add additional workers or shifts, and/or work overtime as necessary to maintain the Construction Schedule.”
 - 3) 8.2.4 The Contractor must conform to the most recently approved Construction Schedule. The Contractor must complete the indicated Work or achieve the required percentage of completion, as applicable, within any interim completion dates established in the most recently approved Construction Schedule.
 - 4) 8.2.5 The Contractor must maintain at the Site, available to the Owner and the Architect for their reference during the progress of the Work, a copy of the approved Construction Schedule and any approved revisions thereto. The Contractor must keep current records of and mark on a copy of the approved Construction Schedule the actual commencement date, progress, and completion date of each scheduled activity indicated on the Construction Schedule.
 - 5) 8.2.6 The Contractor represents that its bid includes all costs, overhead and profit which may be incurred throughout the Contract Time and the period between Substantial and final Completion. Accordingly, the Contractor may not make any claim for delay damages based in whole or in part of the premise

that the Contractor would have completed the Work prior to the expiration of the Contract time but for any claimed delay.

- 6) 8.2.7 If the Contractor's progress is not maintained in accordance with the approved Construction Schedule, or the Owner determines that the Contractor is not diligently proceeding with the Work or has evidence reasonably indicating that the Contractor will not be able to conform to the most recently approved Construction Schedule, the Contractor must, promptly and at no additional cost to the Owner, take all measures necessary to accelerate its progress to overcome the delay and ensure that there will be no further delay in the progress of the Work and notify the Owner.
- 7) 8.2.8 The Owner reserves the right to issue a written directive to accelerate the Work that may be subject to an appropriate adjustment, if any, in the Contract Sum. If the Owner requires an acceleration of the Construction Schedule and no adjustment is made in the Contract Sum, or if the Contractor disagrees with any adjustment made, the Contractor must file a claim as provided in Article 15 or the same will be deemed to be conclusively waived.

d. Change paragraph 8.3.1 as follows:

- 1) Delete the words "labor dispute" and add the words "excusable weather delays as defined in Section 15.1.5.2", between the words "fire" and "unusual" in 3rd line of section 8.3.1.

e. Add the following language to the end of Paragraph 8.3.1:

- 1) A time extension shall be Contractor's sole remedy and compensation for all such delays other than those resulting from the acts or negligence of the Owner, the Architect, or the Owner's separate contractors (collectively "Owner Caused Delays"). For proven Owner Caused Delays, the Contractor may recoup the actual costs resulting from such delays, but not for any additional profit or fee.

25. Article 9: Payments And Completion

a. 9.2 Schedule of Values:

- 1) Add to Paragraph 9.2 :
 - a) In the 1st sentence, add the words "thirty (30) days" between the words "Architect," and "before."

b. 9.3 Application for Payment

- 1) Delete Paragraph 9.3.1 and replace as follows:
 - a) 9.3.1 At least thirty (30) days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment for operations completed in accordance with the schedule of values. Such application shall be notarized, if required, and supported by such data substantiating the Contractor's right to payment as the Owner or Architect may require, such as copies of requisitions from Subcontractors and material suppliers. If the Contract Documents required the

Owner to retain a portion of the payments until some future time, the Applications for Payment shall clearly state the percentage and the amount to be retained. Once the Application is approved by the Architect, the Application for Payment must be submitted for approval to the **Central Lyon Community School District** at their next regularly scheduled meeting. The application must be received at the District office at least one week prior to the scheduled meeting for it to be included in that meeting's scheduled business. The form of Application for Payment shall be a notarized AIA Document G702, APPLICATION AND CERTIFICATE FOR PAYMENT, supported by AIA Documents G703, CONTINUATION SHEET. Contractor shall furnish forms.

- 2) Modify Section 9.3.1.2 by inserting the following the word "Payments" in line 1: 'must be consistent with the approved Schedule of Values and'.
- 3) Add the following new Clauses to 9.3.1:
 - a) 9.3.1.3 Until Substantial Completion the Owner shall pay 95% of the amount due the Contractor on account of progress payments.
 - b) 9.3.1.4 The Owner's release of retained funds and final payment to the Contractor shall be made in accordance with Iowa Code Chapters 26 and 573 provisions.
 - c) 9.3.1.3 Progress payments shall be made monthly upon application. Monthly estimates will be paid to the Contractor as the work progresses in the amounts equal to ninety-five percent (95%) of the Contract Value of the work completed, including materials and equipment delivered and properly stored at the Project site, during the preceding calendar month, and will be based upon an Application prepared by the Contractor and subject to the approval of the Architect. The Contractor shall submit the Application for Payment to the Architect not later than the first day of the following month. The Owner shall make payment to the Contractor by the last day of the month. Such monthly payments shall in no way be construed as an act of acceptance for any part of the work, partially or totally completed. The remaining balance of five percent (5%) of the Contract Sum, shall be paid by the Owner to the Contractor no earlier than thirty-one (31) days after the date of final acceptance of said Work by the Owner, subject to the conditions and in accordance with the provisions of Chapters 26 and 573 of the Code of Iowa. No such partial of final payment will be due until the Contractor has certified to the Owner that the materials, labor and services involved in each estimate have been paid for in accordance with the requirements stated in the Specifications.

- c. Modify Paragraph 9.5 Decisions to Withhold Certification:
 - 1) Add the following to the end of Paragraph 9.5.1:
 - 8. Service work not attended to.
 - 9. Evidence of lack of careful workmanship.
 - 10. Unworkmanlike or over expeditious construction.
 - 11. Lack of attention to the special field duties specified.
 - 2) Delete subparagraph 9.5.4 in its entirety.
- d. 9.6 Progress Payments
 - 1) Add the words "following Board approval" between the words "payment" and "in" in 1st line of Section 9.6.1.
 - 2) Add the following language to the end of Paragraph 9.6.1:
 - a) Owner will, within thirty (30) days of presentation to them of Notarized Certificate for Payment, pay Contractor progress payment on basis of approved Application for Payment. Laws of State of Iowa shall be followed regarding Contractor Payment, with a five percent (5%) retainage held from each progress payment. Final payment shall be made no sooner than thirty-one (31) days following final approval and acceptance of completed Project. Until Substantial Completion, the Owner will pay ninety-five percent (95%) of the amount due the Contractor on account of Progress Payments, (5%) retainage.
 - 3) Delete Paragraph 9.6.4 and substitute the following:
 - a) The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and material and equipment suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven (7) days, the Owner shall have the right to contact Subcontractors to ascertain whether they have been properly paid. Regardless of any requests made pursuant to this section, neither the Owner nor Architect/Engineer shall have an obligation to pay or to see to the payment of money to a Subcontractor, except as may otherwise be required by law.
 - 4) Modify Section 9.6.8 by deleting the word 'lien' throughout and replacing it with the words 'Iowa Code Chapter 573.'
 - 5) Add new paragraph 9.6.9:
 - a) Payment to the Contractor will be made by the Owner from cash on hand from such sources as may be legally available.
 - b) Add subparagraph 9.6.8.1 as follows:
 - 1. Payment to Contractor will be made by Owner from cash on hand from such sources as may be legally available.
 - 6) Delete Section 9.7 and substitute the following:
 - a) If Owner does not pay the Contractor within sixty (60) days after the Contractor submits an Application for Payment to

the Architect, the Contractor may file a claim in accordance with Article 15 of this Contract.

e. 9.8 Substantial Completion

- 1) Add the following language to the end of Paragraph 9.8.1:
 - a) , subject only to completion of minor punch list items, the absence of completion of which does not interfere with Owner's intended use of Project. The Contractor assumes the responsibility for notifying the Architect in writing when the Project is complete and ready for inspection and review by Architect. This letter to the Architect shall include the date after which the Contractor will be ready for final review and inspection. Designated portions of the Work will be reviewed separately.
- 2) Add new Paragraph 9.8.6:
 - a) The Contractor shall reimburse the Owner for any Architect/Engineer's Additional Services and/or attorneys' fees incurred as a result of Contractor's failure to finally complete the Work within thirty (30) days after date specified in the Contract Documents for Project Substantial Completion, or subsequently modified by Change Orders or dates established in the Certificate of Substantial Completion. Reimbursement for these additional services will be deducted by the Owner from the amounts due the Contractor and paid directly to the Architect/Engineer. For purposes of this paragraph "incurred as a result of" includes any architectural fees charged to Owner as Additional Fees under the contract due to the fact that the services were performed thirty (30) days (or some other amount of time specified in the Owner/Architect Agreement) after Substantial Completion. The nature of the services performed (and whether they would have otherwise been performed as normal closeout services at some point under Basic Services) is not relevant to the Contractor's obligations for reimbursement under this section if the contract between the Owner and Architect states that any and all services and related fees are defined as Additional Services solely because they were performed more than thirty (30) days (or some other amount of time specified in the Owner/Architect Agreement) after Substantial Completion.

f. Add new subparagraph 9.8.7:

- 1) 9.8.7.1 Request for Early Release of Retainage Funds:
 - a) 9.8.7.1.1 Upon achieving Substantial Completion, as defined by Iowa Code Chapter 26, the Contractor may formally request the release of all or part of the retainage funds being held on the Project. The Contractors' request for Release of the Retainage Funds shall be accompanied by a sworn statement that ten (10) calendar days prior to

filing the Request for Release of the Funds a notice was given to all known subcontractors, sub-subcontractors and suppliers that the Contractor is requesting the early release of retainage funds. If proper documentation is received from the Contractor, the Owner will release all retainage funds at the next monthly District meeting or within thirty (30) days, whichever is less, except it may retain the following:

- b) 9.8.7.1.2 An amount equal to 200% of the value of labor or materials yet to be provided on the Project as determined by the Owner and its authorized contract representative. For purposes of this section, "authorized contract representative" means the Architect of record on the Project, unless otherwise specified.
- c) 9.8.7.1.3 An amount equal to 200% of the value of any Chapter 573 claims currently on file at the time the Request for Release of Retainage is approved.
- d) 9.8.7.1.4 If the Owner withholds an amount from the retainage payment to the Contractor, the Owner will provide a reason the request is being denied to the Contractor within thirty (30) calendar days of the receipt of the request.
- e) 9.8.7.1.5 Operation, Maintenance, and Warranty Manuals and Record Drawings and Specifications.

g. Add Paragraph 9.8.8

- 1) If proper documentation requested in Subparagraph 9.8.7 is received from Contractor, Owner shall make payment due Contractor at Owner's next monthly board meeting or within thirty (30) days, whichever is less, except the Owner may retain the following to the extent authorized by law:
 - .1 An amount equal to two hundred percent (200%) of the value of labor and materials yet to be provided on the Project as determined by the Owner and its authorized contract representative. For purposes of this Section, "authorized contract representative" means the Architect. Final values to be withheld shall be determined by the Architect/Engineer based on initial estimates provided by Contractor and Architect/Engineer's on-site visits and observations.
 - .2 Double the amount of any Iowa Code Chapter 573 claims currently on file.
 - .3 An amount equal to one-half percent ($\frac{1}{2}$) of the total value of the Project for Operation, Maintenance, and Warranty Manuals and Record Drawings and Specifications not submitted ten (10) days prior to Substantial Completion inspection.

h. Add Paragraph 9.8.9

- 1) If the Owner withholds any amounts of retained funds, the Architect/ Engineer, on behalf of the Owner, shall provide an itemization and list of reasons why amounts are being withheld within thirty (30) calendar days of receipt of request.

i. Add the Sections 9.8.10 through 9.8.14 as follows:

- 1) 9.8.10 Warranties required by the Contract Documents will commence on the Date of Substantial Completion of the Work unless otherwise provided in the Certificate of Substantial Completion or the Contract Documents.
- 2) 9.8.11 Upon execution of the Certificate of Substantial Completion, the Contractor will deliver custody and control of such Work to the Owner. The Owner will thereafter provide the Contractor reasonable access to such Work to permit the Contractor to fulfill the correction, completion and other responsibilities remaining under the Contract and the Certificate of Substantial Completion.
- 3) 9.8.12 Unless otherwise provided in the Certificate of Substantial Completion, the Contractor must complete or correct all items included in the final Punch List within thirty (30) days, subject to the availability of special order parts and materials, after the Date of Substantial Completion.
- 4) 9.8.13 Not later than ten (10) days after the date of Substantial Completion, the Contractor shall furnish to the Architect/Engineer all Closeout Documentation identified in General Requirements (Division 1 of the Specifications). Except with the consent of the Owner, the Architect/Engineer will perform Closeout Documentation review only during the thirty (30) day period following Substantial Completion. The Owner shall be entitled to deduct from the Contract Sum amounts paid to the Architect/Engineer for additional reviews beyond the 30 day time period identified.
- 5) 9.8.14 At the time of Substantial Completion, in addition to removing rubbish and leaving the building "broom clean," the Contractor must replace any broken or damaged materials, remove stains, spots, marks and dirt from decorated Work, clean all fixtures, vacuum all carpets and wet mop all other floors, replace HVAC filters, clean HVAC coils, and comply with such additional requirements, if any, which may be specified in the Contract Documents.

j. 9.10 Final Completion And Final Payment

- 1) Delete Paragraphs 9.10.1 through 9.10.5 and add the following:
 - a) 9.10.1 When the Contractor has completed or corrected all items on the final Punch List and considers that the Work is complete and ready for final acceptance, the Contractor must give written notice to the Owner and the Architect and request a final inspection of the Work as provided in Section 9.10.2. The Contractor's notice and request for a

final inspection must be accompanied by a final Application for Payment and the Submittals required by Section 9.10.3.

1. 9.10.1.1 The Architect/Engineer will perform no more than one (1) observation (for each work phase – if applicable) to determine whether the Work or a designated portion thereof has attained Final Completion in accordance with the Contract Documents. The Owner is entitled to reimbursement from the Contractor for amounts paid to the Architect/Engineer for any additional observations.
- b) 9.10.2 Upon receipt of the Contractor's notice and request for final observation, the Owner and the Architect will promptly make such observation and, when the Owner and the Architect concur that the Work has been fully completed and is acceptable under the Contract Documents, the Architect will issue a Certificate of Final Completion to the Owner. The Contractor's notice and request for final observation constitutes a representation by the Contractor to the Owner and the Work has been completed in full and strict accordance with terms and conditions of the Contract Documents. The Architect will promptly notify the Contractor if the Owner or the Architect do not concur that the Work is finally complete. In such case, the Contractor must bear the cost of any additional services of the Owner or the Architect until the Work is determined to be finally complete services of the Owner or the Architect until the Work is determined to be finally complete.
- c) 9.10.2.1 The Contractor shall provide Project Record Documents, Operation and Maintenance Manuals, Instruction to Owner's personnel, Final Cleaning and other closeout procedures specified elsewhere.
- d) 9.10.3 Final Payment will be made no earlier than thirty-one (31) days following approval by the District at a regularly scheduled meeting, receipt of all Chapter 573 Claim Releases, Sales Tax information, and all other required closeout documents, and subject to the conditions of and in accordance with the provisions of Iowa Code Chapter 573 and Iowa Code Chapter 26. Owner may withhold from final payment any and all amounts required to reimburse the Owner for all costs, fees (including reasonable attorney's fees) it incurred as a result of any Chapter 573 Claims filed on the project. Neither final payment nor any remaining retained percentage will become due until the Contractor submits the following documents to the Architect.
 1. 9.10.3.1 An Affidavit that payrolls, bills for materials and equipment, and other indebtedness connected

with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner), have been paid or otherwise satisfied, submitted on AIA Document G706, Affidavit of Payment of Debts and Claims (latest edition) or such other form as may be prescribed by the Owner.

2. 9.10.3.2 A certificate evidencing that the Contractor's liability insurance and Performance Bond remain in effect during the one-year correction period following Substantial Completion as set forth in Section 12.2.2.1 and 12.2.2.2;
3. 9.10.3.3 A written statement that the Contractor knows of no substantial reason that the insurance will not be renewable to cover the period required by the Contract Documents;
4. 9.10.3.4 Consent of surety to final payment, submitted on AIA Document G707 (latest edition) or other form prescribed by the Owner;
5. 9.10.3.5 Other data required by the Owner establishing payment or satisfaction of obligations, such as receipts, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be prescribed by the Owner;
6. 9.10.3.6 A certified building location survey and as-built site plan in the form and number required by the Contract Documents.
7. 9.10.3.7 All warranties and bonds required by the contract Documents; and
8. 9.10.3.8 Record Documents as provided in Section 3.2.2 and return of Contract Documents as provided therein.
9. 9.10.3.9 Release or waiver of liens and Iowa Code Chapter 573 claims on behalf of Contractor and similar release or waiver on behalf of each Subcontractor and supplier, accompanied by AIA Document G706A, Affidavit of Release of Liens (latest edition) or such other form as may be prescribed by Owner;

k. Add new paragraph 9.11:

- 1) The Contractor and the Contractor's surety, if any, shall be liable for and shall pay the Owner for any extra costs for engineering or architectural services, construction observation services and related expenses necessitated by the delayed prosecution of the work by the Contractor beyond the date of Final Completion required by the Agreement. Such costs are in no way a penalty, but represent additional expenses to the Owner caused by the Contractor's delay in completing the Work.

I. Add paragraph 9.12:

- 1) No assignment by the Contractor of any principal contract or any part thereof, or of the funds to be received thereunder by the Contractor, will be recognized unless such assignment has had the written approval of the Owner and the Surety has been given due notice of such assignment and has furnished written consent thereto. In addition to the usual recitals in the Assignment Contract, the following language must be set forth: "It is agreed that the funds to be paid to the Assignee under this Assignment are subject to prior lien/Iowa Code Chapter 573 claims for services rendered on materials supplied for the performance of all work called for in said Contract, in favor of all persons, firms or corporations rendering such services supplying such materials."

26. Article 10: Protection of Persons and Property

a. Add sub-paragraph 10.1.1 as follows:

- 1) Contractor shall take all necessary precautions to keep the site and work in compliance with the safety and health regulations for construction issued by the Bureau of Labor Standards of the U.S. Department of Labor as well as the Occupational Safety and Health Standards parts 1910 and 1926 as amended and as enforced by the State of Iowa.

b. Modify subparagraph 10.2.2 as follows:

1) Add a new sub-paragraph 10.2.2.1 as follows:

- a) Contractors shall comply with the Iowa Smoke Free Air Act while on Owner property and shall not smoke or use any tobacco while on Owner property. Owner property shall include, but not be limited to, inside private Contractor or employee owned vehicles while parked on Owner property.

c. Add Section 10.2.4.1 to Section 10.2.4:

- 1) When use or storage of explosives, or other hazardous materials, substances or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall give the Owner reasonable advance notice.

d. Add Section 10.2.5.1 to Section 10.2.5:

- 1) Contractors required remedial action for damage and loss to property referred to in Sections 10.2.1.2 and 10.2.1.3 shall repair the damaged materials and surfaces to their original condition, or better, to the satisfaction of the Owner. All such repairs are the responsibility of the Contractor and shall be accomplished at no additional cost to the Owner.

e. Add subparagraph 10.2.9 to paragraph 10.2:

- 1) 10.2.9 At the end of the day's work, all new work likely to be damaged shall be covered. During cold weather protect all work from damage. If low temperatures make it impossible to continue operations safely in spite of cold weather precautions, work shall cease after notifying Architect/Engineer. All other protective measures not mentioned above which may be

required shall be furnished by the particular contractor responsible for such protection.

- f. Add subparagraph 10.2.10 to paragraph 10.2:
 - 1) 10.2.10 Contractor shall construct and maintain all necessary temporary drainage and do all pumping necessary to keep excavations free of water.
 - g. Add subparagraph 10.2.11 to paragraph 10.2:
 - 1) 10.2.11 Contractor shall at all times, protect the excavation, trenches and/or the buildings from damage or rain water, spring water, ground water, backing up of drains, or sewers, etc. Provide all pumps, equipment, and enclosures to give this protection.
 - h. Add subparagraph 10.2.12 to paragraph 10.2:
 - 1) 10.2.12 Contractor shall provide all shoring, bracing, and sheeting as required for safety and for the proper execution of the Work. Remove when work is completed.
 - i. Modify Section 10.3.1 by deleting the word “notify” in line six and replacing it with the words “report the condition in writing to”.
 - j. Delete Section 10.4 and substitute the following:
 - 1) In an emergency affecting safety of persons or property, the Contractor must take all necessary action, without the necessity for any special instruction or authorization from the Owner or Architect, to prevent threatened damage, injury or loss. The Contractor must promptly, but in all events with twenty-four (24) hours of the emergency, report such action in writing to the Owner and Architect. If the Contractor incurs additional costs on account of or is delayed by such emergency, the Contractor may request a change in the Contract Sum or Contract Time to account for such additional costs or delay in accord with Articles 7, 8 and 15. The Contractor must file any such request within ten (10) days of the emergency or it is deemed waived. Any adjustment in the Contract Sum or Contract time shall be limited to the extent that the emergency work is not attributable to the fault or neglect of the Contractor or otherwise the responsibility of the Contractor under the Contract Documents.
27. Article 11: Insurance and Bonds
- a. Section 11.1.1 shall be deleted and replaced with Exhibit A to these Supplementary Conditions, which is attached hereto and incorporated by reference herein.
 - b. Section 11.1.2 shall be deleted and replaced with the following:
 - 1) The Contractor shall furnish bonds covering faithful performance of the Contract and payment of obligations arising thereunder. Bonds may be obtained through the Contractor's usual source and the cost thereof shall be included in the Contract Sum. The amount of each bond shall be equal to one hundred percent (100%) of the Contract Sum.
 - .1 The Contractor shall deliver the required bonds to the Owner not later than ten (10) days following the date the

Agreement is entered into, or, if the Work is to be commenced prior thereto in response to a letter of intent, the Contractor shall, prior to the commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished.

.2 The Contractor shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

.3 The Contractor shall require the bonding company to be registered with authority to transact business in State of Iowa.

28. Add the following subparagraphs:
 - a. 11.1.4 Off Site Storage
 - 1) The Contractor shall provide insurance coverage for portions of the Work stored off the site after written approval of the Owner at the value established in the approval, and also for portions of the Work in transit.
29. 11.2 Owner's Insurance
 - a. Add the following to the last sentence of Subparagraph 11.2.1:
 - 1) Builder's risk insurance shall be provided by the **Owner**.
 - b. Add the following subparagraph:
 - 1) 11.2.2 This property insurance is written with a deductible of \$1,000.00 per occurrence. In the event of a paid claim, the Claimant, including subcontractors, shall be responsible for the deductible amount. Payments of any insurance deductibles will be at the expense of the party claiming loss under the policy.
30. Article 12 UNCOVERING AND CORRECTION OF WORK
 - a. Add the words "upon written authorization from Owner" between the words "Architect" and "be uncovered" in 2nd line of Section 12.1.1.
 - b. Add the words "upon written authorization from Owner" between the words "any request" and "to see" in 2nd line of Section 12.1.2.
 - c. Delete Section 12.2.1 and substitute the following:
 - 1) The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.
 - d. Delete Section 12.2.2.1 and substitute the following:
 - 1) In addition to Contractor's obligations under Section 3.5, if, within two (2) years after date of Substantial Completion of Work or designated portion thereof or after date of commencement of warranties established under any other provision of Contract Documents, or by terms of an applicable special warranty required by Contract Documents, any of Work is found not to be

in accordance with requirements of Contract Documents, Contractor shall correct it promptly after receipt of written notice from Owner to do so. Owner shall give such notice promptly after discovery of condition. Before commencing correction of Work, Contractor shall submit to Owner written description of their proposed repairs. This proposal shall be approved by Design Professional before Contractor commences repair. Once Contractor has completed repair work, they shall notify Owner and Design Professional who shall promptly review corrected work. If Design Professional or Owner rejects corrected Work, Contractor shall continue with repairs until such time as Design Professional and Owner accept corrected Work. Where Contractor corrects defective Work during initial two (2) year period after Substantial Completion, if Owner discovers defects in corrected Work within one (1) year after repairs are made, then Contractor shall be obligated, upon written notice from Owner, to correct such defects within one (1) year from date that repairs were made.

e. Add Section 12.2.6 to Section 12.2 as follows:

- 1) If Contractor fails or refuses to correct Work in accordance with their obligations under Contract Documents after written notice from Owner, then Owner may correct Work and Contractor shall be liable for costs to correct Work, any related architectural, engineering or other consulting costs, attorney's fees and expenses, and fines or penalties, if any. Any amounts due to Owner from Contractor under this Section may be withheld from balance of Contract Sum not yet paid.

31. Article 13 Miscellaneous Provisions

a. Delete Paragraph 13.1 and substitute the following Subparagraph:

- 1) The Contract shall be governed by the laws of the State of Iowa.

b. Add Subparagraph 13.1.1 to Paragraph 13.1 as follows:

- 1) Compliance with Law Provision: the Contractor agrees that it will comply with all applicable Federal, State and local laws, statutes, codes, rules, and regulations having jurisdiction over the Project. Contractor shall take all necessary precautions to keep the site and work in compliance with the safety and health regulations for construction issued by the Bureau of Labor Standards of the U.S. Department of Labor as well as the Occupational Safety and Health Standards, as amended and as enforced by the State of Iowa.

c. Delete Subparagraph 13.2.2 in its entirety.

d. Add the following after the 2nd sentence in Section 13.4.1:

- 1) Contractor shall schedule all tests, inspections, or specific approvals required by law or Contract Documents so as to avoid any delay in Work.

e. Add Section 13.4.7 to Section 13.4.

- 1) In addition to tests required by Section 13.5, Owner may at any time arrange for other tests, inspections and specific approvals

to be performed by others selected by Owner, at Owner's expense. Contractor shall cooperate with Owner and provide access to Work for such tests, inspections and approvals.

f. Delete Paragraph 13.5 and substitute the following Paragraph:

- 1) Payments due and unpaid under the Contract Documents shall bear interest from the date the payment is due and shall bear interest at the rate established by Iowa Code Section 74A.2 or Iowa Code Section 573.14, whichever is less.

32. Add Sections 13.6 through 13.9 to Article 13:

a. 13.6 Owner's Right to Occupy

- 1) Owner shall have the right to occupy, without prejudice to rights of either party, any completed or largely completed portion of structure or Work, notwithstanding the fact that time for completing entire Work, or such portion thereof, may not have expired. Such occupancy and use shall not be an acceptance of Work taken or used.

b. 13.7 Rebates

- 1) Owner shall have the right to apply for, and secure all rebates which are available when Bids are received. Contractor shall provide invoices, itemizations, and cooperation to the Owner in this regard.

c. 13.8 Conformance with Laws

- 1) The Contractor shall conform with provisions of Federal Civil Rights Act, the Code of Iowa, Chapter 216 Civil Rights Commission and rules and regulations adopted thereto by the Iowa Civil Rights Commission. The Contractor shall comply with applicable federal, state, and local laws, rules, regulations, ordinances, policies and procedures, including Owner's policies and procedures, and Iowa Smoke Free Air Act. The Contractor shall require similar clauses in all of their subcontracts for service or materials.

d. 13.9 Equal Opportunity

- 1) 13.9.1 The Contractor shall maintain policies of employment as follows:

- a) 13.9.1.1 The Contractor and the Contractor's Subcontractors shall not discriminate against any employee or applicant for employment because of race, creed, religion, color, sex, national origin, ancestry, familial status, age, mental or physical disability, sexual orientation, gender identity, genetic information or any other protected class under state or federal law. The Contractor shall take affirmative action to insure that applicants are employed, and that employees are treated during employment without regard to their race, creed, religion, color, sex or national origin, ancestry, familial status, age, mental or physical disability, sexual orientation, gender identity, genetic information or any other protected class under state or federal law. Such action shall include, but not be limited to,

the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of non-discrimination.

- b) 13.9.1.2 The Contractor and the Contractor's Subcontractors shall, in all solicitations or advertisements for employees placed by them or on their behalf, state that all qualified applicants will receive consideration for employment without regard to race, creed, religion, color, sex, national origin, ancestry, familial status, age, mental or physical disability, sexual orientation, gender identify, genetic information or any other protected class under state or federal law.

33. Modify Article 14 as follows:

- a. 14.1.1 Delete subparagraph 14.1.1 in its entirety and replace with the following:

- 1) Contractor has no right to stop Work as consequence of non-payment. In event of any disagreement between Contractor and Owner involving Contractor's entitlement to payment, Contractor's only remedy is to file Claim in accordance with Article 15. Contractor shall diligently proceed with Work pending resolution of Claim.

.1 If, however, an Application for Payment has been approved for payment by Owner, and Owner fails to make payment within sixty (60) days of approval of payment by Owner, Contractor may upon ten (10) day written notice to Owner, stop work if payment is not made by Owner within ten (10) days following notice.

- b. Delete subparagraphs 14.1.2 through 14.1.4 in their entirety.

- c. Delete Sections 14.2.1 through 14.2.4 and substitute the following:

- 1) 14.2.1 Delete the section in its entirety and replace with the following:

- a) 14.2.1 The Owner may terminate the Contract for cause if the Contractor:

- 1. Fails to supply adequate properly skilled workers or proper materials;
- 2. Fails to make payment to Subcontractors or Suppliers for materials or labor in accordance with the respective agreements between the Contractor and the Subcontractors or Suppliers;
- 3. Fails to comply with any laws, ordinances, or rules, regulations or orders of a public authority having jurisdiction;

4. Fails to perform the Work in accordance with the Contract Documents or otherwise breaches any provision of the Contract Documents;
 5. Anticipatory breaches or repudiates the Contract;
 6. Fails to make satisfactory progress in the prosecution of the Work required by the Contract; or
 7. Endangers the performance of this Contract.
- 2) 14.2.2 Delete the section in its entirety and replace with the following:
- a) 14.2.2 Owner may terminate Contract, in whole or in part, whenever Owner determines that sufficient grounds for termination exist as provided in Section 14.2.1. Owner will provide Contractor with written notice to cure default. If default is not cured, termination for default is effective on date specified in Owner's written notice. However, if Owner determines that default contributes to curtailment of an essential service or poses an immediate threat to life, health, or property, Owner may terminate Contract immediately upon issuing oral or written notice to Contractor without any prior notice or opportunity to cure. In addition to any other remedies provided by law or Contract, Contractor shall compensate Owner for additional costs that foreseeably would be incurred by Owner, whether costs are actually incurred or not, to obtain substitute performance. Termination for default is termination for convenience if termination for default is later found to be without justification.
- 3) 14.2.3 Upon receipt of written notice from the Owner of termination, the Contractor must:
- .1 Cease operations as directed by the Owner in the notice and, if required by the Owner and County, participate in an inspection of the Work with the Owner, County and the Architect to record the extent of completion thereof to identify the Work remaining to be completed or corrected, and to determine what temporary facilities, tools, equipment and construction machinery are to remain at the Site pending completion of the Work;
 - .2 Complete or correct the items directed by the Owner, and take actions necessary, or that the Owner may direct, for the protection and preservation of any stored materials and equipment and completed Work;
 - .3 Unless otherwise directed by the Owner, remove its tools, equipment and construction machinery from the Site; and
 - .4 Except as directed by the Owner, terminate all existing subcontracts and purchase orders and enter into further subcontracts or purchase orders.

- 4) 14.2.4 Following written notice from the Owner of termination, the Owner may:
 - a) Take possession of the Site and of all materials and equipment thereon, and at the Owner's option, such temporary facilities, tools, construction equipment and machinery thereon owned or rented by the Contractor that the Owner elects to utilize in completing the Work;
 1. Accept assignment of subcontracts and purchase orders, and
 2. Complete the Work by whatever reasonable method the Owner may deem expedient.
- d. Add Sections 14.2.5 through 14.2.9 to Section 14.2:
 - 1) 14.2.5 Upon termination for cause, the Contractor must take those actions described in Section 14.2.3, and the Owner may take those actions described in Section 14.2.4, subject to the prior rights of the Contractor's Surety.
 - 2) 14.2.6 When the Owner terminates the Contract for cause, the Contractor is not entitled to receive further payment until the Work is completed and the costs of completion have been established.
 - 3) 14.2.7 If the unpaid balance of the Contract Sum less amounts which the Owner is entitled to offset from the unpaid Contract balance, including actual or Liquidated Damages, compensation for the Architect's services and expenses made necessary thereby, and other damages and expenses incurred by the Owner, including reasonable attorney's fees, exceeds the costs of completing the Work, including compensation for the Owner's and the Architect's services made necessary thereby, such excess will be paid to the Contractor or Surety, as directed by the Surety. If such costs exceed the unpaid Contract balance, the Contractor must pay the difference to the Owner upon written demand. This obligation for payment survives termination of the Contract.
 - 4) 14.2.8 In completing the Work following termination for cause, the Owner is not required to solicit competitive bids or to award completion work to the lowest bidder, but may obtain such completion work and related services on the basis of sole source procurement and negotiated compensation.
 - 5) 14.2.9 If the Contractor files for protection, or a petition is filed against it, under the Bankruptcy laws, and Contractor wishes to affirm the Contract, Contractor shall immediately file with the Bankruptcy Court a motion to affirm the Contract and shall provide satisfactory evidence to Owner and to the Court of its ability to cure all present defaults and its ability to timely and successfully complete the Work. If Contractor does not make such an immediate filing, Contractor accepts that Owner shall petition the Bankruptcy Court to lift the Automatic Stay and permit Owner to terminate the Contract.

34. Delete subparagraphs 14.4.1 through 14.4.3 in their entirety and replace with the following:
- a. 14.4.1 The Owner may, at any time, terminate the Contract or any portion thereof or the Work for the Owner's convenience and without cause.
 - b. 14.4.2 Upon receipt of the written notice from the Owner of termination, the Contractor must:
 - .1 Cease operations as directed by the Owner in the notice and, if required by the Owner, participate in an inspection of the Work with the Owner and the Architect/Engineer to record the extent of completion thereof, to identify the Work remaining to be completed or corrected, and to determine what temporary facilities, tools, equipment and construction machinery are to remain at the Site pending completion of the Work;
 - .2 Complete or correct the items directed by the Owner, and take actions necessary, or that the Owner may direct, for the protection and preservation of any stored materials and equipment and completed Work;
 - .3 Unless otherwise directed by the Owner, remove its tools, equipment and construction machinery from the Site, and
 - .4 Except as directed by the Owner, terminate all existing subcontracts and purchase orders related to the Work and enter into no further subcontracts or purchase orders therefor.
 - c. 14.4.3 Following written notice from the Owner of termination, the Owner may:
 - .1 Take possession of the Site and of all materials and equipment thereon, and at the Owner's option, such temporary facilities, tools, construction equipment and machinery thereon owned or rented by the Contractor that the Owner elects to utilize in completing the Work;
 - .2 Accept assignment of subcontracts and purchase orders; and
 - .3 Complete the Work by whatever reasonable method the Owner may deem expedient.
 - d. 14.4.4 In case of termination for the Owner's convenience, the Contractor will be entitled to compensation only for the following items:
 - 1) Payment for acceptable Work performed up to the date of termination;
 - 2) The costs of preservation and protection of the Work if requested to do so by the Owner;
 - 3) The cost of terminating the following contracts including:
 - .1 Purchased materials but only if not returnable and provided to the Owner, or the restocking or return charge, if any, if returnable at the Owner's written election;
 - .2 Equipment rental contracts if not terminable at no cost but not to exceed an amount equal to thirty (30) days rental;
 - .3 Documented transportation costs associated with removing Contractor-owned equipment.

- .4 Documents demobilization and close-out costs; and
- .5 Overhead and profit on the foregoing not to exceed ten percent (10%).

- 4) The Contractor will not be compensated for the cost of terminating subcontracts, which must be terminable at no cost to the Owner if the Contract is terminated.
 - 5) The Contractor will not be compensated for the cost of any idled employees unless the employee is under a written employment contract entitling the employee to continued employment after termination of the Contract and the employee cannot be assigned to other work provided that in all events the Contractor's costs must be limited to thirty (30) days of employment costs from the date of the notice of termination. The Contractor is not entitled to any other costs or compensation (including lost or expected profit, uncompensated overhead or related expenses, or the cost of preparing and documenting its compensable expenses under this Subsection 14.4.4 as a consequence of the Owner's termination of the Contract for convenience). The Contractor conclusively and irrevocably waives its right to any other compensation or damages (compensatory or punitive) arising from termination of the Contract. If the Owner and the Contractor are unable to agree upon the amounts specified in this subsection, the Contractor may submit a Claim as provided in Article 15. The Claim must be limited to resolution of the amounts specified in Subsections 14.4.4.1, 14.4.4.2, 14.4.4.3 and 14.4.4.4 of this Subsection 14.4.4. No other cost, damages or expenses may be claimed or paid to the Contractor or considered as part of the Claim, the same being hereby conclusively and irrevocably waived by the Contractor. Any such Claim must be delivered to the Owner within thirty (30) days of the termination of the Contract and must contain a written statement setting forth the specific reasons and supporting calculations and documentation as to the amounts the Contractor claims to be entitled to under this Subsection as a result of the termination of the Contract.
- e. 14.4.5 The Contractor's obligations surviving final payment under the Contract, including without limitation those with respect to insurance, indemnification, and correction of Work that has been completed at the time of termination, remains effective notwithstanding termination for convenience of the Owner.
35. Delete Section 15.1.1 text and substitute the following:
- a. A Claim is a written demand or assertion by Contractor seeking, as matter of right, payment of money, a change in the Contract Time, or other relief with respect to terms of Contract. Responsibility to substantiate Claims shall rest with Contractor. Nothing contained in this section is intended to apply to or in any way limit Owner's right to make claims related to or arising out of Contract.

36. Delete the words “Substantial Completion” in line 4 of Section 15.1.2 and replace it with “Final Acceptance.”
37. Delete the last sentence of Section 15.1.2.
38. Delete Section 15.1.3.1 and substitute the following:
 - a. Claims by Contractor shall be initiated by written notice to Owner and to Initial Decision Maker with copy sent to Architect/Engineer, if Architect/Engineer is not serving as Initial Decision Maker. Claims by Contractor shall be initiated within ten (10) days after occurrence of event giving rise to such Claim or within ten (10) days after Contractor first recognizes condition giving rise to Claim, whichever is later. As condition of making claim for additional costs, Contractor shall maintain and produce accurate records to substantiate all additional costs actually incurred. If Claim for actual cost is approved, Owner shall pay Contractor actual costs incurred plus either (a) ten percent (10%) for overhead and profit for work performed by Contractor, or (b) five percent (5%) overhead and profit for work performed by subcontractor, as applicable.
39. Delete Section 15.1.4.1 and substitute the following:
 - a. Pending final resolution of Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, Contractor shall proceed diligently with performance of Contract and Owner shall continue to make payments as may be required in accordance with Contract Documents.
40. Delete Section 15.1.6.2 and substitute the following:
 - a. If adverse weather conditions are the basis of a Claim for additional time, the Claim shall be documented by data substantiating that the weather conditions upon which the Claim is based (1) were abnormal when compared to the previous 5-year period, during the same time frame and at the location of the Work, (2) could not have been reasonably anticipated, and (3) had an adverse effect on the date of substantial completion of the Work.
41. Add Subparagraph 15.1.6.3 and 15.1.6.4 to Subparagraph 15.1.6:
 - a. 15.1.6.3 Claims for increase in the Contract Time shall set forth in detail the circumstances that form the basis for the Claim, the date upon which each cause of delay began to affect the progress of the Work, the date upon which each cause of delay ceased to affect the progress of the Work and the number of days’ increase in the Contract Time claimed as a consequence of each such cause of delay. The Contractor shall provide such supporting documentation as the Owner may require including, where appropriate, a revised construction schedule indicating all the activities affected by the circumstances forming the basis of the Claim.
 - b. 15.1.6.4 The Contractor shall not be entitled to a separate increase in the Contract Time for each one of the number of causes of delay which may have concurrent or interrelated effects on the progress of the Work, or for concurrent delays due to the fault of the Contractor.

42. Modify the first sentence of Section 15.2.1 to read as follows:
 - a. Claims, excluding those arising under Sections 10.3, 10.4 and 11.5 shall be referred to the Initial Decision Maker for initial decision.
43. Delete Subparagraph 15.2.6 and substitute the following:
 - a. The parties may file for mediation of an initial decision at any time, upon mutual agreement of the parties.
44. Delete Subparagraphs 15.2.6.1 and 15.2.8 in their entirety.
45. Delete Subparagraph 15.3.1 in its entirety.
46. Delete Section 15.3.2 and substitute the following:
 - a. The parties shall endeavor in good faith to resolve claims, disputes and other matters in question between them by mutual agreement and may, by mutual agreement and in their discretion, submit same to non-binding mediation which shall be in accordance with Iowa Code Chapter 679C, unless otherwise mutually agreed upon by the parties. Requests for mediation shall be given in writing to the other Party to this Agreement. If the Owner and Contractor are unable to mutually agree upon mediator in writing within sixty (60) days of receiving written request for mediation, either party may then institute legal or equitable proceedings. Mediation shall be voluntary only and shall not be a prerequisite to litigation or other means of dispute resolution.
47. Delete Section 15.3.3.
48. Delete Subparagraph 15.4 and replace with the following:
 - a. Any legal claim brought under this Agreement shall be filed in the Iowa District Court in **Lyon County**, unless otherwise mutually agreed to by the parties.
49. Add Article 16 as follows:
 - a. Smoking will not be allowed on Owner's property, which shall include inside private vehicles parked on Owner's property. In addition, employees of Contractor, Subcontractors, and materials suppliers shall not wear apparel that advertises tobacco, alcohol, or illicit drugs, nor has profane language or images on them.

EXHIBIT A – Central Lyon Community School District

MINIMUM INSURANCE REQUIREMENTS:

COMMERCIAL GENERAL LIABILITY:

General Aggregate Limit	\$2,000,000
Products - Completed Operation Aggregate Limit	\$2,000,000
Personal and Advertising Injury Limit	\$1,000,000
Each Occurrence Limit	\$1,000,000
Damage to a Premises Rented to You Limit	\$ 100,000
Medical Payments	\$ 5,000

Commercial General Liability policy shall be written on an occurrence form using ISO form CG 00 01 or equivalent form.

Policy shall include the following endorsements:

ISO endorsement CG 20 10 or equivalent endorsement naming the **Central Lyon Community School District**, its board members, employees and agents as an additional insured.

ISO endorsement CG 20 32 or equivalent endorsement naming Project Architects, Engineers, and Surveyors as an additional insured.

ISO endorsement CG 20 37 or equivalent endorsement naming the **Central Lyon Community School District**, its board members, employees and agents as an additional insured for completed operations. This endorsement shall be maintained for a minimum of two years after completion and acceptance of the project by the **Central Lyon Community School District**.

ISO Endorsement CG 20 01 or equivalent endorsement indicating additional insured status for the **Central Lyon Community School District**, its board members, employees and agents is primary and non-contributory.

ISO endorsement CG 25 03 or equivalent endorsement, Designated Construction Project(s) General Aggregate Limit.

ISO endorsement CG 24 04 or equivalent endorsement, Waiver of Transfer of Rights of Recovery Against Others to Us, naming the **Central Lyon Community School District**.

Governmental Immunities Endorsement (see attached specimen).

BUSINESS AUTOMOBILE LIABILITY:

Combined single limit of	\$1,000,000
-Or-	
Bodily Injury (per person)	\$1,000,000
Bodily Injury (per accident)	\$1,000,000
Property Damage	\$1,000,000

Business auto liability shall be written on ISO form CA 00 01 or equivalent form.

1. Policy shall include Symbol 1 (Any Auto). If no owned autos, hired and non-owned auto liability is acceptable.
2. Include ISO endorsement CA 04 44 or equivalent endorsement, Waiver of Transfer of Rights of Recovery Against Others to Us, naming the **Central Lyon Community School District**.
3. Include ISO endorsement CA 99 48, Pollution Liability - Broadened Coverage for Covered Autos, or equivalent endorsement if the Contractor has vehicles that transport fuel onto **Central Lyon Community School District** property.

WORKERS COMPENSATION & EMPLOYERS LIABILITY:

1. Workers Compensation - Statutory - State of Iowa
2. Employers Liability

Bodily Injury Limit Each Accident	\$500,000
Bodily Injury Disease - Policy Limit	\$500,000
Bodily Injury Disease - Limit Each Employee	\$500,000

Workers Compensation shall include the following endorsement: WC 0003 13, Waiver of Our Right to Recover from Others, in favor of the **Central Lyon Community School District**.

Sole Proprietors, Partners and Members must be included for coverage. Executive Officers may not be excluded from coverage.

CONTRACTOR’S POLLUTION COVERAGE \$1,000,000

Pollution coverage is required on any of the following activities:

- Moisture protection (roofing, sealants, and siding)
- Mechanical, electrical, and plumbing
- Environmental services/work
- Demolition
- Drywall
- Doors and windows
- Concrete

If contractor cannot provide evidence of Pollution Coverage, an environmental indemnity agreement will be required. Agreement will provide **Central Lyon Community School District** indemnification from claims and

liability arising from the presence or release of hazardous substances, within the course of work.

Include all endorsements, declaration pages and schedule of forms pages along with the certificate of insurance.

UMBRELLA OR EXCESS LIABILITY:

Limit Each Occurrence \$5,000,000

Aggregate Limit \$5,000,000

Umbrella or Excess liability policy shall provide excess coverage and be at least as broad in coverage as the following required policies and endorsements: Commercial General Liability, Business Auto and Employer's Liability.

Central Lyon Community School District

GOVERNMENTAL IMMUNITIES ENDORSEMENT

1. Nonwaiver of Governmental Immunity. The insurance carrier expressly agrees and states that the purchase of this policy and the including of **Central Lyon Community School District** as an Additional Insured does not waive any of the defenses of governmental immunity available to the **Central Lyon Community School District** under Code of Iowa Section 670.4 as it now exists and as it may be amended from time to time.
2. Claims Coverage. The insurance carrier further agrees that this policy of insurance shall cover only those claims not subject to the defense of governmental immunity under the Code of Iowa Section 670.4 as it now exists and as it may be amended from time to time. Those claims not subject to Code of Iowa Section 670.4 shall be covered by the terms and conditions of this insurance policy.
3. Assertion of Governmental Immunity. The **Central Lyon Community School District** shall be responsible for asserting any defense of governmental immunity, and may do so at any time and shall do so upon the timely written request of the insurance carrier.
4. Non-Denial of Coverage. The insurance carrier shall not deny coverage under this policy and the insurance carrier shall not deny any of the rights and benefits accruing to the **Central Lyon Community School District** under this policy for reasons of governmental immunity unless and until a court of competent jurisdiction has ruled in favor of the defense(s) of governmental immunity asserted by the **Central Lyon Community School District**.

No Other Change in Policy. The above preservation of governmental immunities shall not otherwise change or alter the coverage available under the policy.

ACKNOWLEDGMENT AND CERTIFICATION

("Company") is providing services to the **Central Lyon Community School District** ("District") as a vendor, supplier, or contractor or is operating or managing the operations of a vendor, supplier or contractor. The services provided by the Company may involve the presence of the Company's employees upon the real property of the schools of the District.

The Company acknowledges that Iowa law prohibits a sex offender who has been convicted of a sex offense against a minor from being present upon the real property of the schools of the District. The Company further acknowledges that, pursuant to law, a sex offender who has been convicted of a sex offense against a minor may not operate, manage, be employed by, or act as a contractor, vendor or supplier of services or volunteer at the schools of the District.

The Company hereby certifies that no one who is an owner, operator or manager of the Company has been convicted of a sex offense against a minor. The Company further agrees that it shall not permit any person who is a sex offender convicted of a sex offense against a minor to provide any services to the District in accordance with the prohibitions set forth above.

This Acknowledgment and Certification is to be construed under the laws of the State of Iowa. If any portion hereof is held invalid, the balance of the document shall, notwithstanding, continue in full legal force and effect.

In signing this Acknowledgment and Certification, the person signing on behalf of the Company hereby acknowledges that he/she has read this entire document that he/she understands its terms, and that he/she not only has the authority to sign the document on behalf of the Company, but has signed it knowingly and voluntarily.

Dated: _____

By: _____
(name of vendor/supplier/contractor/sub-contractor)

Printed Name: _____

Title: _____

END OF SECTION

SECTION 01 11 13

SUMMARY OF WORK

PART 1 - GENERAL

1.1 WORK COVERED BY CONTRACT DOCUMENTS/REQUIREMENTS INCLUDES THE FOLLOWING:

- A. The following work being bid under separate bid packages comprise the **2024 Facility Improvements, Central Lyon Community School District, Rock Rapids, IA:**
- a. Bid Package A – Bus Barn:
 - i. Site demolition/preparation and utility work associated with the project.
 - ii. Construction of a new bus barn including all architectural, structural, mechanical, plumbing, and electrical per drawings and specifications.
 - iii. Construction of all new earthwork, utilities and paving per drawings and specifications.
 - iv. Coordination with other trades and Owner completed work.
 - v. Construction mobilization.
 - vi. Temporary barriers and protective measures as necessary.
 - vii. Removal and disposal of all construction debris.
 - viii. Final clean up and close-out.

 - b. Bid Package B – Pedestrian Bridge Repair:
 - i. Demolition of bridge structure, guardrails and other elements as described.
 - ii. Masonry repairs to existing building.
 - iii. Clean up and reuse of various existing structural elements.
 - iv. Installation of new bridge structure elements including steel, solid concrete plank and concrete topping slab.
 - v. Installation and painting of new guardrails.
 - vi. Coordination with other trades.
 - vii. Construction mobilization.
 - viii. Temporary barriers and protective measures as necessary.
 - ix. Removal and disposal of all construction debris.
 - x. Final clean up and close-out.

1.2 RELATED REQUIREMENTS

- A. General Conditions of the Contract.
- B. Section 00 73 00: Supplementary General Conditions.
- C. Section 01 77 19: Contract Closeout Procedures

1.3 CONTRACTOR'S DUTIES

- A. Except as specifically noted, provide and pay for:
 - 1. Labor, materials and equipment.
 - 2. Tools, construction equipment and machinery.
 - 3. Other facilities and services necessary for proper execution and completion of Work.
- B. The Owner is exempt from Sales/Use Tax on products permanently incorporated into the Work.
 - 1. The Owner will provide the necessary tax exemption certificate(s).
 - 2. Contractor must provide company contact and tax identification information for ALL subcontractors and suppliers performing work or providing materials for this project within 7 days of Owner's notice of intent to award the construction contract.
- C. Secure and pay for, as necessary, for proper execution and completion of Work, and as applicable at time of receipt of bids:
 - 1. Permits.
 - 2. Government Fees.
 - 3. Licenses.
- D. Give required notices.
- E. Comply with codes, ordinances, rules, regulations, orders and other legal requirements of public authorities that bear on performance of Work.
- F. Promptly submit written notice to Architect/Engineer of observed variance of Contract Documents from legal requirements. It is not Contractor's responsibility to make certain that drawings and specifications comply with codes and regulations.
 - 1. Appropriate modifications to Contract Documents will adjust necessary changes.
 - 2. Assume responsibility for Work known to be contrary to such requirements, without notice.
- G. Enforce strict discipline and good order among employees. Do not employ:
 - 1. Unfit Persons.
 - 2. Persons not skilled in assigned task.
- H. If, in the course of the work, the Contractor knowingly encounters and recognizes human remains, burial markers, archeological sites or previously un-delineated wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence or good faith belief of Such existence of such remains or features may be made as provided in Article 15.

1.4 CONTRACTS

- A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 50 00 - Agreement Form.
- B. **ALL work is being bid as one prime contract with TWO (2) Bid Packages.**
Bidder agrees to perform all Contract Work, including demolition, architectural, structural, mechanical, electrical, plumbing and site and utility work on BOTH Bid Packages and Alternates, described in the Bid Documents.
1. Bidders are REQUIRED to bid on BOTH Bid Packages, Alternates and Unit Prices. Any Contractor not bidding BOTH Bid Packages, Alternates and Unit Prices will risk having their bid disqualified.
 2. Owner will determine the final scope of work by selecting any or all Bid Packages and/or Alternates from a SINGLE contractor based on the low total combined cost of the selected Bid Packages and/or Alternates. Owner may select ANY combination of Bid Packages and Alternates.
 3. ONE contractor will be selected to do the work based on the low total bid cost for any combination of Bid Packages and/or Alternates selected.
- C. Contract for construction to consist of Work and requirements shown on the drawings and specified in the Project Manual consisting of:
1. General Conditions of the Contract.
 2. Supplementary General Conditions.
 3. Division 1: General Requirements
 4. Division 2: Existing Conditions
 5. Division 3: Concrete (specifications on drawings)
 6. Division 4: Masonry
 7. Division 5: Metals
 8. Division 6: Wood, Plastics and Composites
 9. Division 7: Thermal and Moisture Protection
 10. Division 8: Openings
 11. Division 9: Finishes
 12. Division 10: Specialties
 13. Division 13: Special Construction
 14. Division 22: Plumbing Requirements
 15. Division 23: Heating, Ventilating & Air Conditioning
 16. Division 26: Electrical Requirements
 17. Division 27: Communication
 18. Division 28: Electronic Safety and Security
 19. Division 31: Earthwork

1.5 WORK BY OTHERS

- A. Work on this Project that will be executed by the Owner or other Contractors prior, during or after the major construction period.
1. Building Access/Security
 2. Computer network and equipment

3. Security camera system
4. Exterior building signage
5. Miscellaneous toilet accessories
6. Telephone system
7. Loose furnishings and equipment
8. Bus Barn casework/shelving
9. Bus Barn wash bay equipment
10. Bus Barn water softener
11. Seeding of disturbed areas and landscaping

1.6 WORK SEQUENCE, SCHEDULE & COORDINATION

- A. General work schedule and phasing as follows:
 - a. Bus Barn
 - i. Begin construction around April 15, 2024
 - ii. Substantial completion October 1, 2024
 - b. Pedestrian Bridge Replacement
 - i. Begin construction around May 6, 2024
 - ii. Substantial completion August 16, 2024
- B. Perform work to accommodate the Owner's schedule; coordinate the construction schedule and operations, storage of materials and parking of construction vehicles with Owner's representative.
- C. Operations will need to be maintained while new work is completed.
- D. Owner will complete work after new work is completed. Contractors will be responsible for coordinating work with Owner.
- E. Each individual sub-contractor from different bid packages will be responsible for coordinating their work with the General Contractor.

1.7 CONTRACTOR'S USE OF PREMISES

- A. Substantial completion shall be in accordance with the projected dates in the bidding documents.
- B. Confine operations at site to areas permitted by:
 1. Law.
 2. Ordinances.
 3. Permits.
 4. Contract Documents.
- C. Contractor to limit his use of the premises for Work and for storage to allow for:
 1. Work by other Contractors.
 2. Owner occupancy.
- D. Damaged areas to be repaired to previous condition.
- E. Verify parking facilities and space for storage units (if necessary) with the Owner and other contractors on site.
- F. Space for exterior storage of materials will be made available in close proximity to the building and on an as needed basis. Coordinate with Owner.

- G. Each Contractor assumes full responsibility for the protection and safe keeping of products, under his Contract, stored on the site.
- H. Move any stored products, under Contractor's control, which interfere with operations of a separate Contractor.
- I. Each Contractor to obtain and pay for the use of additional storage or work areas needed for his operations.
- J. Contractor to maintain, in a safe condition, any required exits from the existing buildings through areas of new construction.
- K. Do not load structure(s) with weight that will endanger structure.
- L. Smoking is strictly prohibited in and around the building (prohibited anywhere on school grounds).

END OF SECTION

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SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Procedures for preparation and submittal of applications for progress payments.
- B. Documentation of changes in Contract Sum and Contract Time.
- C. Change procedures.
- D. Procedures for preparation and submittal of application for final payment.

1.02 RELATED REQUIREMENTS

- A. Section 00 52 00 - Contracting Forms and Supplements: Forms to be used.
- B. Section 01 32 16 - Construction Progress Documentation: for the administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.03 SCHEDULE OF VALUES

- A. Form to be used: AIA G703.
- B. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Correlate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Contractor's construction schedule.
 - d. Contractor's construction schedule.
- C. Forms filled out by hand will not be accepted.
- D. Submit Schedule of Values electronically or a paper copy in duplicate within 15 days after date of Owner-Contractor Agreement.
- E. Architect will review the Initial Schedule of Values and make marks to indicate corrections or modifications required. Architect will not review or approve the Initial Application for Payment until the Initial Schedule of Values has been approved.
- F. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the specification section. Identify site mobilization.
- G. Provide a breakdown of major cost items in the General Conditions as separate line items. Include the following line items, applicable to the Project, as part of the contractor's normal breakdown.
 - 1. General Conditions
 - 2. Bond, Insurance
 - 3. Supervision
 - 4. Mobilization

5. Demobilization
 6. Permits and fees
 7. Shop Drawings / Engineering (included here in General Conditions or as part of individual products in subsequent sections)
 8. Record Documents
 9. Temporary Facilities: refer to paragraph below.
- H. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with the Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of five percent of Contract Sum.
- I. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
- J. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
1. Differentiate between items stored on-site and items stored off-site. For any materials stored offsite, include evidence of insurance and provide standard ACCORD insurance form.
 - 2. Differentiate work under each bid package. Separate schedules of value for each accepted bid package will be required. Funding for each project must be accounted for separately.**
 - 3. Differentiate construction contingency allowances under each bid package separately on appropriate schedules of value.**
- K. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
- L. Each item in the schedule of values and Applications for Payment shall be complete. Include total cost and proportionate share of general overhead and profit for each item.
1. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or distributed as general overhead expense, at Contractor's option.
- M. Schedule Updating: Update and resubmit the schedule of values before the next Applications for Payment when Change Orders or Construction Change Directives result in a change in the Contract Sum.
- N. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

- A. Each Application for Payment shall be consistent with previous applications and payments as certified by Architect, and paid for by Owner.
1. Initial Application for Payment, 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.

1. Submit draft copy of Application for Payment seven (7) days prior to due date for review by Architect.

C. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor.

Architect will return incomplete applications without action.

1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.

D. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.

1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment, for stored materials.
2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:
 - a. Materials previously stored and included in previous Applications for Payment.
 - b. Work completed for this Application utilizing previously stored materials.
 - c. Additional materials stored with this Application.
 - d. Total materials remaining stored, including materials with this Application.
 - e. Location of storage.
 - f. Photographic evidence of storage showing material identification.

E. Retainage: Deduct 5% from the completed work covered by each Application for Payment until the project is Substantially Completed, as determined by the Architect, at which time an application for 95% of the total net amount earned can be submitted.

F. Transmittal: Submit three signed and notarized original copies of each Application for Payment to Architect by a method ensuring receipt within 24 hours.

1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.

G. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:

1. List of subcontractors with address and telephone number.
2. Schedule of values.
3. Contractor's construction schedule (preliminary if not final).

4. Submittal schedule (preliminary if not final). Electronic Submittal Website may be used if timeline for submittals is utilized.
 5. List of Contractor's staff assignments.
 6. Copies of building permits.
 7. Report of preconstruction conference.
 8. Certificates of insurance and insurance policies.
 9. Performance and payment bonds.
- H. Payment Period: Submit at intervals stipulated in the Agreement.
- I. Form to be used: AIA G702 and G703.
- J. Forms filled out by hand will not be accepted.
- K. For each item, provide a column for listing each of the following:
1. Item Number.
 2. Description of work.
 3. Scheduled Values.
 4. Previous Applications.
 5. Work in Place and Stored Materials under this Application.
 6. Total Completed and Stored to Date of Application.
 7. Percentage of Completion.
 8. Balance to Finish.
 9. Retainage.
- L. Execute certification by signature of authorized officer.
- M. Use data from approved Schedule of Values. Provide dollar value in each column for each line item for portion of work performed and for stored products.
- N. List each authorized Change Order as a separate line item, listing Change Order number and dollar amount as for an original item of work.
- O. Submit three hardcopies of each Application for Payment.
- P. Include the following with the application:
1. Transmittal letter as specified for submittals in Section 01 32 16.
 2. Construction progress schedule, revised and current as specified in Section 01 32 16.
- Q. When Architect requires substantiating information, submit data justifying dollar amounts in question. Provide one copy of data with cover letter for each copy of submittal. Show application number and date, and line item by number and description.

1.05 MODIFICATION PROCEDURES

- A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.
1. Architect will use AIA Document G710, "Architect's Supplemental Instructions."
 2. The Contractor will review and sign the ASI, if in agreement with it, and return to Architect. Contractor will have 5 business days to review distributed ASI and comment and sign. If the Contractor has an objection, clarifications, or modifications to the ASI, the Contractor must respond with the 5 business

days. After 5 business days, or with no comments, the ASI will become final and part of the Contract Documents.

- B. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
1. Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 2. Within time specified in Proposal Request or 14 calendar days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor, equipment, subcontracted work, and supervision directly attributable to the change. Furnish itemized data to substantiate costs of material, taxes, freight, equipment, and labor.
 - d. Quotation Form: Use forms acceptable to Architect.
- C. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor, equipment, subcontracted work, and supervision directly attributable to the change. Furnish itemized data to substantiate costs of material, taxes, freight, equipment, and labor.
 5. Proposal Request Form: Use AIA Document G709 or form acceptable to Architect
- D. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
1. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.

- a. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
 2. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 - a. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.
 3. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
 4. Promptly execute the change.
- E. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
1. For pre-determined unit prices and quantities, the amount will be based on the fixed unit prices. Unit pricing will be utilized for any additions or deductions from base bid requirements.
 2. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.
- F. Substantiation of Costs: Provide full information required for evaluation.
1. On request, provide the following data:
 - a. Quantities of products, labor, and equipment.
 - b. Taxes, insurance, and bonds.
 - c. Overhead and profit.
 - d. Justification for any change in Contract Time.
 - e. Credit for deletions from Contract, similarly documented.
 2. Support each claim for additional costs with additional information:
 - a. Dates and times work was performed, and by whom.
 - b. Time records and wage rates paid.
 - c. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
 3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.
- G. Execution of Change Orders: Architect will issue Change Orders for signatures of parties as provided in the Conditions of the Contract.
1. On Owner's approval of a Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.
- H. A change order may include Contractor responses to one or more Proposal Requests (and / or Construction Change Directives) that have been approved.
- I. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.
- J. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

- K. Promptly enter changes in Project Record Documents.
- L. The Contractor shall include all adjustments to the Contract Sum in all subsequent Applications for Payment only after receipt of a fully executed copy of each Change Order.

1.06 APPLICATION FOR SUBSTANTIAL COMPLETION PAYMENT

- A. After issuance of the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 - 1. Include documentation supporting 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.
 - 3. Submit the "Certificate of Substantial Completion Request Form" included in this Project Manual. Review of project will not take place until receipt of this signed form.

1.07 APPLICATION FOR FINAL PAYMENT

- A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.
- B. Application for Final Payment will not be considered until the following have been accomplished:
 - 1. All closeout procedures specified in Section 01 77 19.
 - 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 G707, "Consent of Surety to Final Payment."
 - 5. Evidence that claims have been settled.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

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SECTION 01 21 00

ALLOWANCES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

1.02 CASH ALLOWANCES

A. Costs Included in Cash Allowances: Cost of product to Contractor or subcontractor, less applicable trade discounts, less applicable taxes.

B. Architect Responsibilities:

1. Select products in consultation with Owner and transmit decision to Contractor.
2. Prepare Change Order.

C. Contractor Responsibilities:

1. On notification of which products have been selected, execute purchase agreement with designated supplier and installer.
2. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
3. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Differences in costs will be adjusted by Change Order.

1.03 ALLOWANCES SCHEDULE

A. Project Contingency.

1. Contractor shall include in the bid a construction contingency allowance for the following Bid Packages:
 - a. Bid Package A - \$100,000
 - b. Bid Package B - \$20,000
2. Allowance must be indicated as a separate line item on the schedule of values for each Bid Package. Contingency is to be used in the event that unknown conditions are discovered during the completion of the new work at either project site.
3. In the event that a change order is needed for unforeseen repairs, etc., the cost of said repairs will be charged against the construction contingency and shown on each payment application.
4. In the event that funds are remaining in the construction contingency after the work is complete, the balance will be refunded to the Owner by the final project change order.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 22 00

UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDED

- A. List of unit prices, for use in preparing Bids.
- B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

1.02 RELATED REQUIREMENTS

- A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Unit Prices.
- B. Section 01 20 00 - Price and Payment Procedures: Additional payment and modification procedures.

1.03 COSTS INCLUDED

- A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.04 UNIT QUANTITIES SPECIFIED

- A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.05 MEASUREMENT OF QUANTITIES

- A. Take all measurements and compute quantities. Measurements and quantities will be verified by Architect.
- B. Assist by providing necessary equipment, workers, and survey personnel as required.
- C. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

1.06 PAYMENT

- A. Payment for Work governed by unit prices will be made on the basis of actual measurements and quantities that are incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.
- B. Payment will not be made for any of the following:
 - 1. Products wasted or disposed of in a manner that is not acceptable.
 - 2. Products determined as unacceptable before or after placement.
 - 3. Products not completely unloaded from the transporting vehicle.
 - 4. Products placed beyond the lines and levels of the required Work.
 - 5. Products remaining on hand after completion of the Work.
 - 6. Loading, hauling, and disposing of rejected Products.

1.07 SCHEDULE OF UNIT PRICES

A. BID PACKAGE A – BUS BARN

- 1. **Unit Price No. A-UP1:** Unsuitable Soils Removal and Replacement – Building Area.
 - a. Description: Over-excavation of soft and/or unsatisfactory soils and replacement with engineered fill under the building area should unsuitable materials be encountered beyond what is specified. State the amount per CY of material to be used as a cost under these conditions.
 - b. Unit Measurement: The special inspections company shall provide quantity calculations for determining the actual amount of soils to be removed and replaced.
 - c. This unit price will be used for areas under the building only. **It will also be used as a deductive unit cost should less work be required than what is shown on the drawings.**
- 2. **Unit Price No. A-UP2:** Unsuitable Soils Removal and Replacement - Paving.
 - a. Description: Over-excavation of soft and/or unsatisfactory soils and replacement with engineered fill under paving areas should unsuitable materials be encountered beyond what is specified. State the amount per CY of material to be used as a cost under these conditions.
 - b. Unit Measurement: The special inspections company shall provide quantity calculations for determining the actual amount of soils to be removed and replaced.
 - c. This unit price will be used for areas under paving only.

END OF SECTION

SECTION 01 23 00

ALTERNATES

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Description of Alternates.

1.02 RELATED REQUIREMENTS

- A. Document 00 21 13 - Instructions to Bidders: Instructions for preparation of pricing for Alternates.

1.03 ACCEPTANCE OF ALTERNATES

- A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in the Owner-Contractor Agreement.
- B. Coordinate related work and modify surrounding work to integrate the Work of each Alternate.

1.04 SCHEDULE OF ALTERNATES

- A. Bid Package A - Alternate No. A-C1- Bus Barn Paving
 - 1. Provide and install additional paving as shown on the civil plans/specs. Work generally includes required site preparation/grading outside that specified under base bid, forming and pouring new concrete paving on the east and west sides of the building.

END OF SECTION

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SECTION 01 29 73

SCHEDULE OF VALUES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Contractor shall submit to the Architect/Engineer a Schedule of Values allocated to the various portions of the work, within ten (10) days after award of Contract.
- B. Upon request of the Architect/Engineer, support the values with data that will substantiate their correctness.
- C. The Schedule of Values, unless objected to by the Architect/Engineer, shall be used only as the basis for the Contractor's applications for payment.
- D. The Contractor, within thirty days, shall submit an anticipated billing schedule for the entire project.

1.2 RELATED REQUIREMENTS

- A. Section 00 72 13: Conditions of the Contract

1.3 FORM AND CONTENTS OF SCHEDULE OF VALUES

- A. Type schedule on 8½" X 11" white paper or AIA Document G703 - Continuation; Contractor's standard forms and an automated printout will be considered for approval by Architect/Engineer upon Contractor's request. Identify schedule with:
 - 1. Title of project and location.
 - 2. Architect/Engineer and Project number.
 - 3. Name and address of Contractor.
 - 4. Contract designation.
 - 5. Date of submission.
- B. Schedule shall list the installed value of the component parts of the work in sufficient detail to serve as a basis for computing values for progress payments during construction.
- C. Follow the Table of Contents of this Project Manual as the format for listing component items.
 - 1. Identify each line item with the number and title of the respective major section of the Specifications.
- D. For each major line item, list sub-values of major products or operations under the item.
- E. For the various portions of the work:
 - 1. Each item shall include a directly proportional amount of the Contractor's overhead and profit.

2. For items on which progress payments will be requested for stored materials, break down the value into:
 - a. The cost of the materials, delivered and unloaded, with taxes paid.
 - b. The total installed value.
- F. The sum of all values listed in the schedule shall equal the total Contract sum.
- G. **Provide a separate schedule of values for each bid package accepted.**

END OF SECTION

SECTION 01 31 19

PROJECT MEETINGS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Contractor shall schedule and administer periodic progress meetings, and specially called meetings throughout progress of the work as needed.
 - 1. Prepare agenda for meetings.
 - 2. Distribute written notice of each meeting four (4) days in advance of meeting date.
 - 3. Make physical arrangements for meetings.
 - 4. Preside at meetings.
 - 5. Record the minutes, including significant proceedings and decisions.
 - 6. Reproduce and distribute copies of minutes within three (3) days after each meeting:
 - a. To participants in the meeting.
 - b. To parties affected by decisions made at the meeting.
 - c. Furnish three copies of minutes to Architect/Engineer.
- B. Representatives of Contractors, Subcontractors, and suppliers attending meetings shall be qualified and authorized to act on behalf of the entity each represents.
- C. Architect/Engineer(s) will attend meetings to ascertain that work is expedited consistent with Contract Documents and construction schedules.

1.2 RELATED REQUIREMENTS

- A. Section 01 32 16: Construction Schedules

1.3 REGULAR CONSTRUCTION PROGRESS MEETINGS

- A. Schedule as needed and appropriate for the work being performed.
- B. Location: A central site, convenient for all parties, designated by the General Contractor.
- C. Attendance:
 - 1. Owner's representative.
 - 2. Architect/Engineer and his professional consultants.
 - 3. Contractor's superintendent.
 - 4. Major subcontractors.
 - 5. Major suppliers.
 - 6. Others, as appropriate.
- D. Suggested Agendum:
 - 1. Distribution and discussion of:
 - a. List of major subcontractors and suppliers.
 - b. Projected construction schedules.
 - 2. Critical work sequencing.

3. Major equipment deliveries and priorities.
4. Project coordination:
 - a. Designation of responsible personnel.
5. Procedures and processing of:
 - a. Field decisions.
 - b. Proposal requests.
 - c. Submittals.
 - d. Change orders.
 - e. Applications for payment.
6. Adequacy of distribution of Contract Documents.
7. Procedures for maintaining Record Documents.
8. Use of premises:
 - a. Office, work and storage areas.
 - b. Owner's requirements.
9. Construction facilities, controls, and construction aids.
10. Temporary utilities.
11. Safety and first-aid procedures.
12. Security procedures.
13. Housekeeping procedures.
14. Review of pertinent Contract conditions of Architect.

END OF SECTION

SECTION 01 32 16

CONSTRUCTION SCHEDULES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Promptly after award of the Contract, the General Contractor, with the assistance of major subcontractors, is to prepare and submit to the Architect/Engineer an estimated construction progress schedules for the Work, with sub-schedules of related activities, which are essential to its progress.
- B. Submit revised progress schedules periodically.
- C. Provide a separate construction schedule for each bid package accepted.

1.2 RELATED REQUIREMENTS

- A. Submit revised progress schedules periodically.
- B. Section 00 72 13: Conditions of the Contract
- C. Section 01 11 13: Summary of Work
- D. Section 01 31 19: Project Meetings
- E. Section 01 77 19: Contract Closeout Procedures

1.3 FORM OF SCHEDULE

- A. Prepare schedules in the form of a horizontal bar chart.
 - 1. Provide separate horizontal bar for each trade or operation.
 - 2. Horizontal Time Scale: Identify the first work day of each week.
 - 3. Scale and Spacing: To allow space for notations and future revisions.
 - 4. Minimum Sheet Size: 11" X 17".
- B. Format of Listings: The chronological order of the start of each item of work.
- C. Identification of Listings: By major Specification section numbers.

1.4 CONTENT OF SCHEDULES

- A. Construction Progress Schedule:
 - 1. Show the complete sequence of construction by activity.
 - 2. Show the dates for the beginning, and completion of, each major element of construction. Specifically list:
 - a. Site clearing.
 - b. Site excavation.
 - c. Site utilities.
 - d. Demolition work.
 - 3. Show projected percentage of completion for each item, as of the first day of each month.

- B. Submittal Schedule for shop drawings, product data, and samples. Show:
 - 1. The dates for Contractor's submittals.
 - 2. The dates approved submittals will be required from the Architect/Engineer.
- C. Provide sub-schedules to define critical portions of prime schedules.

1.5 PROGRESS REVISIONS

- A. Indicate progress of each activity to date of submission.
- B. Show changes occurring since previous submission of schedule:
 - 1. Major changes in scope.
 - 2. Activities modified since previous submission.
 - 3. Revised projections of progress and completion.
 - 4. Other identifiable changes.
- C. Provide a narrative report, as needed, to define:
 - 1. Problem areas, anticipated delays, and the impact on the schedule.
 - 2. Corrective action recommended, and its effect.
 - 3. The effect of changes on schedules of pertinent Subcontractors.

1.6 SUBMISSIONS

- A. Submit initial schedules within ten (10) days after award of Contract.
 - 1. Architect/Engineer will review schedules and return reviewed copy within ten (10) days after receipt.
 - 2. If required, resubmit within seven (7) days after return of reviewed copy.
- B. Submit revised progress schedules with each Application for Payment.
- C. Submit the number of opaque reproductions, which the Contractor requires, plus two (2) copies, which will be retained by the Architect/Engineer.

1.7 DISTRIBUTION

- A. Distribute copies of the reviewed schedules to:
 - 1. Job site file.
 - 2. Subcontractors.
 - 3. Other concerned parties.
- B. Instruct recipients to report promptly to the Contractor in writing any problems anticipated by the projections shown in the schedules.

END OF SECTION

SECTION 01 33 23

SHOP DRAWINGS, PRODUCT DATA AND SAMPLES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Submit shop drawings and product data as required by each specification section in electronic format (.pdf files).
- B. Submit physical samples as required by each specification section to Architect's office.
 - 1. Submit transmittal document for all samples in electronic format.

1.2 RELATED REQUIREMENTS

- A. Conditions of Contract: Definitions and additional responsibilities of parties.
- B. Section 01 32 16: Construction Schedules
- C. Section 01 78 39: Project Record Documents
- D. Designate in the construction schedule, or in a separate coordinated schedule, the dates for submission and the dates that reviewed shop drawings, production data, and samples will be needed.

1.3 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

- A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
 - 1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
 - 2. Contractor and Architect are required to use this service.
 - 3. It is Contractor's responsibility to submit documents in allowable format.
 - 4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
 - 5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu(www.bluebeam.com), unless such software capability is provided by the service provider.
 - 6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.

7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.
- B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.
- C. Submittal Service: The selected service must be either:
 1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
 2. ProCore: www.procore.com
- D. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

1.4 SHOP DRAWINGS

- A. Drawings shall be presented in a clear and thorough manner.
 1. Details shall be identified by reference to sheet and detail, schedule or room numbers shown on Contract drawings.
 2. Architect's own drawings (duplicated electronic media), obtained for use in preparing shop drawings by individual contractors, WILL NOT BE ALLOWED and will be rejected.

1.5 PRODUCT DATA

- A. Preparation:
 1. Clearly mark to identify pertinent products or models.
 2. Show performance characteristics and capacities.
 3. Show dimensions and clearances required.
 4. Show wiring or piping diagrams and controls.
- B. Manufacturer's Standard Schematic Drawings and Diagrams:
 1. Modify drawings/diagrams to delete information not applicable to the work.
 2. Supplement standard information to provide information specifically applicable to the work.

1.6 SAMPLES

- A. Office samples shall be of sufficient size and quantity to clearly illustrate:
 1. Functional characteristics of the product with integrally related parts and attachment devices.
 2. Full range of color, texture and pattern.
- B. Field Samples and Mock-Ups:
 1. Contractor shall erect at the Project site a location acceptable to the Architect/Engineer.
 2. Size or Area: Specified in the respective specification section.
 3. Fabricate each sample and mock-up complete and finished.
 4. Remove mock-ups at conclusion of work or when acceptable to the Architect/Engineer.

1.7 CONTRACTOR RESPONSIBILITIES

- A. Review shop drawings, product data, and samples prior to submission.
 - 1. If deviations, discrepancies, or conflict between shop drawings, samples, product data, and the Contract Documents in the form of design drawings and specifications are discovered either prior to or after submittals are processed by the Architect/Engineer the design drawings and specifications' control shall be followed.
- B. Determine and verify:
 - 1. Field measurements.
 - 2. Field construction criteria.
 - 3. Catalog numbers and similar data.
 - 4. Conformance with specifications
- C. Coordinate each submittal with requirements of the work and of the Contract Documents.
- D. Notify the Architect/Engineer in writing at time of submission of any deviations on the submittals from requirements of the Contract Documents.
- E. Begin no fabrication or work that requires submittals until return of submittals with Architect/Engineer approval.

1.8 SUBMISSION REQUIREMENTS

- A. Make submittals promptly in accordance with approved schedule, and in such sequence as to cause no delay in the work or of any other contractor.
- B. Number of submittals required
 - 1. Shop Drawings:
 - a. All size formats: One (1) electronic copy.
 - 2. Product Data:
 - a. All size formats: One (1) electronic copy.
 - 3. Samples:
 - a. Physical samples as required by each specification section.
 - b. Color(s) for products WILL NOT be selected from a color card (unless allowed by Architect). Submit color samples on actual materials for all color selection.
 - c. Submit the number of samples stated in each specification section.
 - d. Samples must be documented by an electronic transmittal form.
- C. Submittals shall contain:
 - 1. The date of submission and the dates of any previous submissions.
 - 2. The Project title and number.
 - 3. Contract identification.
 - 4. The names of:
 - a. Contractor.
 - b. Supplier.
 - c. Manufacturer.
 - 5. Identification of the product, with specification section number.
 - 6. Field dimensions, clearly identified as such.

7. Relation to adjacent or critical features of the work or materials.
8. Applicable standards, such as ASTM or Federal Specification numbers.
9. Identification of deviations from Contract Documents.
10. Identification of revisions on re-submittals.
11. An 8" X 3" blank space for Contractor and Architect/Engineer stamps.
12. Contractor's stamp, initialed or signed, certifying the review of submittal, verification of products, field measurements and field construction criteria, and coordination of the information within the submittal with requirements of the work and of Contract Documents.

a. **PROVIDE STAMP WITH TEXT AS FOLLOWS:**

By approving and submitting these shop drawings, product data and samples, we represent that we have determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that we have checked and coordinated the information contained within such submittals with the requirements of the WORK of the CONTRACT DOCUMENTS.

CONTRACTOR: _____

DATE: _____

BY: _____

- b. Architect will **NOT** make review of shop drawings, samples, or product data unless the stamp is affixed to the document submitted signed and dated.

1.9 REVIEW PROCESS

- A. General Contractor shall provide submittal materials as described in section 1.7 above.
- B. Architect/Engineer will review submittal information and return to GC.
- C. General Contractor will be responsible for delivering reviewed submittals to the construction team in electronic format.
- D. If re-submittal is required, the same process shall be followed.

1.10 RE-SUBMISSION REQUIREMENTS

- A. Make any corrections or changes in the submittals required by the Architect/Engineer and resubmit until approved.
- B. Shop Drawings and Product Data:
 1. Revise initial drawings or product data and resubmit as specified for the initial submittal.
 2. Indicate any changes which have been made other than those requested by the Architect/Engineer.
- C. Samples: Submit new samples as required for initial submittals.

1.11 DISTRIBUTION

- A. Distribute shop drawings and copies of product data, which carries the Architect/Engineer stamp of approval, to:
 - 1. Job site file.
 - 2. Record document file.
 - 3. Other affected Contractors.
 - 4. Subcontractors.
 - 5. Supplier or Fabricator.
- B. Distribute samples, which carry the Architect/Engineer's stamp of approval, as directed by the Architect/Engineer.

1.12 ARCHITECT/ENGINEER'S DUTIES

- A. Review submittals with reasonable promptness and in accordance with the schedule.
- B. Affix stamp, initials or signature, and indicate requirements for re-submittal, or approval of submittal.
 - 1. The Architect/Engineer's review of these submittals is only for general conformance with the design concept of the work and general compliance with the information given in the Contract Documents. Any action shown is subject to the requirements of the drawings and specifications.
 - 2. The review is not intended to be exhaustive; nor is the Architect/Engineer obligated to verify dimensions, quantities, or the performance of any systems.
 - 3. The Architect/Engineer's review of a specific item shall not be considered approval of an assembly of which the item is a part.
- C. Return submittals to Contractor for distribution, or for re-submission.

END OF SECTION

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SECTION 01 45 33

CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES (Bid Packages A and B)

A. PART 1 GENERAL

I. SECTION INCLUDES

1. Code-required special inspections.
 - a. Steel (Bid Package B only)
 - b. Concrete (Bid Packages A and B)
 - c. Soils (Bid Packages A and B)
2. Testing services incidental to special inspections.
3. Submittals.

II. RELATED REQUIREMENTS

1. Document 00 31 00 - Available Project Information: Soil investigation data.
2. Document 00 72 00 - General Conditions: Inspections and approvals required by public authorities.
3. Section 01 33 23 - Administrative Requirements: Submittal procedures.
4. Section 01 60 00 - Product Requirements: Requirements for material and product quality.

III. ABBREVIATIONS AND ACRONYMS

1. AHJ: Authority having jurisdiction.
2. NIST: National Institute of Standards and Technology.

IV. DEFINITIONS

1. Code or Building Code: ICC (IBC)-2018, Edition of the International Building Code and specifically, Chapter 17 - Special Inspections and Tests.
2. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.
3. Special Inspection:
 - a. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.

- b. Special inspections are separate from and independent of tests and inspections conducted by Owner / District or Contractor for the purposes of quality assurance and contract administration.

V. REFERENCE STANDARDS

1. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
2. AISC 360 - Specification for Structural Steel Buildings 2016 (Revised 2021).
3. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
4. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.
5. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field 2021a.
6. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete 2017.
7. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction 2019.
8. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection 2021.
9. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing 2021.
10. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
11. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel 2018.
12. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars 2018, with Amendment (2020).
13. ICC (IBC)-2018 - International Building Code 2018.

VI. SUBMITTALS

1. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
 - a. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.

- b. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
 - c. Submit certification that Special Inspection Agency is acceptable to AHJ.
 - 2. Special Inspection Reports: After each special inspection, Special Inspector is required to promptly submit at least two copies of report; one to Architect and one to the AHJ.
 - a. Include:
 - i. Date issued.
 - ii. Project title and number.
 - iii. Name of Special Inspector.
 - iv. Date and time of special inspection.
 - v. Identification of product and specifications section.
 - vi. Location in the Project.
 - vii. Type of special inspection.
 - viii. Date of special inspection.
 - ix. Results of special inspection.
 - x. Compliance with Contract Documents.
 - b. Final Special Inspection Report: Document special inspections and correction of discrepancies prior to the start of the work.
 - 3. Test Reports: After each test or inspection, promptly submit at least two copies of report; one to Architect and one to AHJ.
 - a. Include:
 - i. Date issued.
 - ii. Project title and number.
 - iii. Name of inspector.
 - iv. Date and time of sampling or inspection.
 - v. Identification of product and specifications section.
 - vi. Location in the Project.
 - vii. Type of test or inspection.
 - viii. Date of test or inspection.
 - ix. Results of test or inspection.
 - x. Compliance with Contract Documents.

VII. SPECIAL INSPECTION AGENCY

- 1. Owner / District will employ services of a Special Inspection Agency to perform inspections and associated testing and

sampling in accordance with ASTM E329 and required by the building code.

2. The Special Inspection Agency may employ and pay for services of an independent testing agency to perform testing and sampling associated with special inspections and required by the building code.
3. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

VIII. TESTING AND INSPECTION AGENCIES

1. Owner / District may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.
2. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

B. PART 2 PRODUCTS - NOT USED

C. PART 3 EXECUTION

I. SCHEDULE OF SPECIAL INSPECTIONS, GENERAL

1. Frequency of Special Inspections: Special Inspections are indicated as continuous or periodic.
 - a. Continuous Special Inspection: Special Inspection Agency is required to be present in the area where the work is being performed and observe the work at all times the work is in progress.
 - b. Periodic Special Inspection: Special Inspection Agency is required to be present in the area where work is being performed and observe the work part-time or intermittently and at the completion of the work.

II. SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION (BID PACKAGE B ONLY)

1. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC)-2018.
2. Structural Steel and Cold Formed Steel Deck Material:
 - a. Structural Steel: Verify identification markings comply with AISC 360, Section M3.5; periodic.
 - b. Other Steel: Verify identification markings comply with ASTM standards specified in the approved Contract Documents; periodic.

- c. Submit manufacturer's certificates of compliance and test reports; periodic.
3. Welding:
- a. Structural Steel and Cold Formed Steel Deck:
 - i. Complete and Partial Joint Penetration Groove Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - ii. Multipass Fillet Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - iii. Single Pass Fillet Welds Less than 5/16 inch Wide: Verify compliance with AWS D1.1/D1.1M; periodic.
 - iv. Plug and Slot Welds: Verify compliance with AWS D1.1/D1.1M; continuous.
 - v. Single Pass Fillet Welds 5/16 inch or Greater: Verify compliance with AWS D1.1/D1.1M; continuous.
 - vi. Floor and Roof Deck Welds: Verify compliance with AWS D1.3/D1.3M; continuous.
 - b. Reinforcing Steel: Verify items listed below comply with AWS D1.4/D1.4M and ACI 318, Section 3.5.2.
 - i. Verification of weldability; periodic.
 - ii. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames as well as where it is referenced in older codes. Elements of special structural walls of concrete and shear reinforcement; continuous.
 - iii. Shear reinforcement; continuous.
 - iv. Other reinforcing steel; periodic.
4. Steel Frame Joint Details: Verify compliance with approved Contract Documents.
- a. Details, bracing and stiffening; periodic.
 - b. Member locations; periodic.
 - c. Application of joint details at each connection; periodic.

III. SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION (BID PACKAGES A AND B)

- 1. Reinforcing Steel, Including Prestressing of Tendons and Placement: Verify compliance with approved Contract Documents and ACI 318, Sections 3.5 and 7.1 through 7.7; periodic.
- 2. Bolts Installed in Concrete: Where allowable loads have been increased or where strength design is used, verify

- compliance with approved Contract Documents and ACI 318, Sections 8.1.3 and 21.2.8 prior to and during placement of concrete; continuous.
3. Anchors Post-Installed in Hardened Concrete: Verify compliance with ACI 318.
 - a. Adhesive Anchors: Verify horizontally or upwardly-inclined orientation installations resisting sustained tension loads - Section 17.8.2.4; continuous.
 4. Design Mix: Verify plastic concrete complies with the design mix in approved Contract Documents and with ACI 318, Chapter 4 and 5.2; periodic.
 5. Concrete Sampling Concurrent with Strength Test Sampling: Each time fresh concrete is sampled for strength tests, verify compliance with ASTM C172/C172M, ASTM C31/C31M and ACI 318, Sections 5.6 and 5.8 and record the following, continuous:
 - a. Slump.
 - b. Air content.
 - c. Temperature of concrete.
 6. Concrete and Shotcrete Placement: Verify application techniques comply with approved Contract Documents and ACI 318, Sections 5.9 and 5.10; continuous.
 7. Specified Curing Temperature and Techniques: Verify compliance with approved Contract Documents and ACI 318, Sections 5.11 through 5.13; periodic.
 8. Concrete Strength in Situ: Verify concrete strength complies with approved Contract Documents and ACI 318, Section 6.2, for the following.
 9. Formwork Shape, Location and Dimensions: Verify compliance with approved Contract Documents and ACI 318, Section 6.1.1; periodic.

IV. SPECIAL INSPECTIONS FOR SOILS (BID PACKAGES A AND B)

10. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
 - a. Design bearing capacity of material below shallow foundations; periodic.
 - b. Design depth of excavations and suitability of material at bottom of excavations; periodic.
 - c. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.

- d. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

11. Testing: Classify and test excavated material; periodic.

IV. SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

- 1. Special Inspection Agency shall:
 - a. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - b. Perform specified sampling and testing of products in accordance with specified reference standards.
 - c. Ascertain compliance of materials and products with requirements of Contract Documents.
 - d. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 - e. Perform additional tests and inspections required by Architect.
 - f. Submit reports of all tests or inspections specified.
- 2. Limits on Special Inspection Agency Authority:
 - a. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - b. Agency may not approve or accept any portion of the work.
 - c. Agency may not assume any duties of Contractor.
 - d. Agency has no authority to stop the work.
- 3. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.
- 4. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

V. TESTING AGENCY DUTIES AND RESPONSIBILITIES

- 1. Testing Agency Duties:
 - a. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
 - b. Perform specified sampling and testing of products in accordance with specified standards.
 - c. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - d. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
 - e. Perform additional tests and inspections required by Architect.
 - f. Submit reports of all tests or inspections specified.
- 2. Limits on Testing or Inspection Agency Authority:

- a. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
 - b. Agency may not approve or accept any portion of the work.
 - c. Agency may not assume any duties of Contractor.
 - d. Agency has no authority to stop the work.
3. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.
 4. Contractor will pay for re-testing required because of non-compliance with specified requirements.

VI. CONTRACTOR DUTIES AND RESPONSIBILITIES

1. Contractor Responsibilities, General:
 - a. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
 - b. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
 - c. Provide incidental labor and facilities:
 - i. To provide access to work to be tested or inspected.
 - ii. To obtain and handle samples at the site or at source of Products to be tested or inspected.
 - iii. To facilitate tests or inspections.
 - iv. To provide storage and curing of test samples.
 - d. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
 - e. Arrange with Owner / District's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

END OF SECTION

SECTION 01 50 00

TEMPORARY UTILITIES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Furnish, install and maintain temporary utilities required for construction and remove on completion of work.

1.2 RELATED REQUIREMENTS

- A. Section 01 11 13: Summary of Work

1.3 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with National Electric Code.
- B. Comply with federal, state, and local codes and regulations and with utility company's requirements.

PART 2 - PRODUCTS

2.1 MATERIALS - GENERAL

- A. Materials may be new or used but must be adequate in capacity for the required usage, must not create unsafe conditions, and must not violate requirements of applicable codes and standards.

2.2 TEMPORARY ELECTRICITY AND LIGHTING

- A. Temporary power and lighting may be connected to the Owner's existing electrical service. GC shall provide all necessary temporary distribution equipment. Owner will pay for power used. GC shall coordinate with Owner on scheduling and placement of the temporary services.
- B. Provide adequate artificial lighting for all areas of work when natural light is not adequate for work, and for areas accessible to the public.
- C. Contractor and Subcontractors shall furnish their own extension cords.

2.3 TEMPORARY VENTILATION

- A. During the construction of the Project, the Contractor shall provide and pay for temporary devices, enclosures, fuel, and other services necessary to provide all temporary ventilation required to adequately complete the work.
- B. The temporary system shall meet specified minimum conditions and protect materials and finishes from damage due to temperature or humidity.
- C. Devices shall be safe in operation. Either individual devices shall be vented to

outside or the enclosed spaces shall be power ventilated, or both, so that the maximum concentration of carbon monoxide in any given area shall not exceed fifty (50) parts of carbon monoxide per million parts of air. Portable devices shall be standard approved units complete with controls.

- D. The Contractor shall provide adequate forced ventilation of enclosed areas for curing of installed materials, to disperse humidity, and to prevent hazardous accumulation of dust, fumes, vapors, or gases.
- E. The permanent ventilating equipment shall not be used for temporary ventilating and all ductwork shall be taped shut and remain so until the entire Project is fully cleaned, painting operations are complete and the Project is ready for finish flooring and other final finishing work.
- F. At the beginning of finish flooring/final finishing work, and after the Architect/Engineer's approval for such use has been received, the permanent ventilating equipment may be activated. Even then, this permanent equipment shall not be used unless all controls are fully operational and the completed filtering system is operative. Before final acceptance of the Project, all filters shall be replaced, and the ventilating equipment and return air ductwork shall be vacuum cleaned.
 - 1. The Architect shall reserve the right to require that the permanent system, being used to provide construction ventilation, be shut down and temporary devices again be activated if construction dust is not maintained within acceptable levels.
- G. The Owner will pay all costs for operating the permanent ventilation equipment.
- H. The parties installing the temporary devices shall remove the temporary work when no longer required.

2.4 TEMPORARY TELEPHONE SERVICE

- A. The Contractor shall arrange for and pay for telephone service at the construction site.
- B. Maintain telephone availability until the date of substantial completion of the work.

2.5 TEMPORARY WATER

- A. The Owner will pay for water for construction purposes.
- B. Each Contractor to provide their own hoses.
- C. The Contractor shall provide drinking water on site for use by all persons.
- D. All temporary connections shall be removed by the contractor when no longer required.

2.6 TEMPORARY SANITARY FACILITIES

- A. Contractor WILL NOT be allowed to use the Owner's existing toilet facilities. Temporary facilities are required and are the responsibility of the Contractor.

PART 3 - EXECUTION

3.1 GENERAL

- A. Comply with all applicable code requirements.
- B. Maintain and operate systems to assure continuous service.
- C. Modify and extend systems as work progress requires.

3.2 REMOVAL

- A. Completely remove temporary materials and equipment when their use is no longer required.
- B. Clean and repair damage caused by temporary installations or use of temporary facilities.
- C. Restore permanent facilities used for temporary services to original condition.

END OF SECTION

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SECTION 01 52 13

FIELD OFFICE AND SHEDS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall install and maintain a temporary field office inside the work area during entire construction period.
 - 1. Space inside the renovation area is available. Temporary office area must be maintained throughout construction.
 - 2. Adequate space and accommodations must be provided for construction meetings.
- B. At completion of Work, remove field office and contents.

1.2 RELATED REQUIREMENTS

- A. Section 01 11 13: Summary of Work
- B. Section 01 50 00: Temporary Utilities

1.3 OTHER REQUIREMENTS

- A. Prior to installation of temporary office, consult with Architect/Engineer on location, access, and related facilities.

1.4 REQUIREMENTS FOR FACILITIES

- A. Space is available inside the work area for temporary office facilities. No trailers will be required as there is not room to park them on site.
- B. Contractor's Office and Facilities:
 - 1. Size: As required for general use and to provide space if needed for Project meetings.
 - 2. Lighting and Temperature Control: As required to maintain comfortable conditions.
 - 3. Telephone: One direct line instrument.
 - 4. Thermometer: One for outdoor use.
 - 5. Furnishings:
 - a. One layout table.
 - b. Files for Project Record Documents.
 - c. Additional accessories, as required, for office functions.

PART 2 - PRODUCTS

2.1 MATERIALS, EQUIPMENT, FURNISHINGS

- A. May be new or used, but must be serviceable, adequate for required purpose, and must not violate applicable codes or regulations.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prepare existing space as needed for temporary use as office space.

3.2 INSTALLATION

- A. Set up temporary office space efficiently and in location to avoid work areas. Provide all necessary office equipment to support work as a temporary office and meeting place.

3.3 MAINTENANCE AND CLEANING

- A. Provide periodic maintenance and cleaning for temporary structures, furnishings, equipment, and services.

3.4 REMOVAL

- A. Remove temporary field office, contents, and services at a time no longer needed. Leave area as it was originally found.

END OF SECTION

SECTION 01 56 01

TEMPORARY BARRIERS, CONSTRUCTION AIDS & SECURITY FENCING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Furnish, install, and maintain suitable barriers and construction aids as required to prevent public entry, and to protect the Work, existing facilities from construction operations. Remove when no longer needed.

1.2 RELATED REQUIREMENTS

- A. Section 01 11 13: Summary of Work

1.3 REQUIREMENTS OF REGULATORY AGENCIES

- A. Comply with federal, state, and local codes and regulations.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Materials may be new or used, suitable for the intended purpose, but must not violate requirements of applicable codes and standards.

2.2 TEMPORARY SITE SECURITY FENCING

- A. Provide fencing as required by drawings.
- B. Chain Link Fence and Gate System: Chain link fence, gate, and hardware system.
 - a. Provide complete enclosure assembly.
 - b. Height: 6'. Wire mesh gage: as appropriate for application.
 - c. Enclosure shall have swinging hinged gates, padlock hardware, and all necessary parts/reinforcing to provide a complete installation.
 - d. Provide fully galvanized system with top rails for exterior use.
 - e. Do not sink fence posts into existing paving. Utilize base plates and sand bags for ballast.
 - f. Fencing mesh shall come to within 2" of grade.
 - g. Conform to all required applicable codes and standards.

2.3 BARRIERS

- A. Materials to Contractor's option, as appropriate to serve required purpose.
 - a. At Contractor's Option, plastic "snow fencing" may be used for temporary

barriers around the detention pond or other work areas required to separate construction from Owner's use areas of parking/building access on the east end of the existing building.

- b. Contractor remains responsible for safety, security, access, etc. to all work areas under their control throughout the entire construction period.

2.4 CONSTRUCTION AIDS

- A. Provide construction aids and equipment, required by personnel and to facilitate execution of the Work; scaffolds, staging, ladders, stairs, ramps, runways, platforms, railings, hoists, cranes, chutes and other such facilities and equipment.
 1. Refer to respective sections for particular requirements for each trade.
- B. Maintain facilities and equipment in first-class condition.

2.5 TEMPORARY PROTECTION

- A. Provide temporary protection to separate work areas from areas of existing building occupied by Owner; to prevent penetration of dust or moisture into occupied areas, to prevent damage to existing equipment, to maintain security for existing facility and to protect Owner's employees, and operations from construction work.
- B. Temporary partition and ceiling enclosures: Framing and sheet materials which comply with structural/fire rating requirements of applicable codes and standards.
 1. Close joints between sheet materials, and seal edges and intersections with existing surfaces, to prevent penetration of dust or moisture.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Consult with Architect/Engineer, review site conditions and factors which affect barriers, construction procedures and construction aids, including adjacent properties and public facilities which may be affected by execution of the Work.

3.2 GENERAL

- A. Install facilities of a neat and reasonable uniform appearance, structurally adequate for required purposes; maintain barriers during entire construction period.
- B. Relocate barriers and construction aids as required by progress of construction, by storage or work requirements, and to accommodate legitimate requirements of Contracting Officer and of other contractors employed at the site.

3.3 RELOCATION/REMOVAL

- A. Contractor will be responsible for moving/relocating temporary fencing/barriers during construction to properly secure the site, allow for phased work areas and to keep site access available for the Owner as needed.

- B. Completely remove all barriers and construction aids, including foundations, when construction has progressed to the point that they are no longer needed, and when approved by Owner.
- C. Clean and repair damage caused by installation, fill and grade areas of the site to required elevations and slopes, and clean the area.

END OF SECTION

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SECTION 01 60 00

PRODUCT REQUIREMENTS, OPTIONS, AND SUBSTITUTIONS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Products.
- B. Workmanship.
- C. Manufacturers' Instructions.
- D. Transportation and Handling.
- E. Storage and Protection.
- F. Substitutions and Product Options.

1.2 RELATED REQUIREMENTS

- A. Section 01 78 23: Operating and Maintenance Data
- B. Section 01 78 33: Warranties and Bonds

1.3 PRODUCTS

- A. Products include material, equipment, and systems.
- B. Comply with specifications and referenced standards as minimum requirements.
- C. Components required to be supplied in quantity within a specification section shall be the same and shall be interchangeable.

1.4 WORKMANSHIP

- A. Comply with industry standards, except when specific tolerances or specified requirements indicate more rigid standards or more precise workmanship.
- B. Perform work by persons qualified to product workmanship of specified quality.
- C. Secure products in place with positive anchorage devices designed and sized to withstand stress, vibration, and racking.

1.5 MANUFACTURER'S INSTRUCTIONS

- A. When the work is specified to comply with manufacturers' instructions, submit copies as specified in Section 01 33 23, distribute copies to persons involved, and maintain one (1) set in field office.
- B. Perform the work in accordance with details of instructions and specified requirements. Should a conflict exist between specifications and instructions, consult with Architect/Engineer.
 - 1. Work that is specified to comply with manufacturers' instructions shall be required to meet manufacturers' most recent recommendations.

1.6 TRANSPORTATION AND HANDLING

- A. Transport products by methods to avoid product damage; deliver in undamaged condition in manufacturer's unopened containers or packaging, dry.
- B. Provide equipment and personnel to handle products by methods to prevent soiling or damage.
- C. Promptly inspect shipments to assure that the products comply with requirements, quantities are correct, and the products are undamaged.

1.7 STORAGE AND PROTECTION

- A. Store products in accordance with manufacturer's instructions, with seals and labels intact and legible. Store sensitive products in weather tight enclosures; maintain within temperature and humidity ranges required by manufacturer's instructions.
- B. For exterior storage of fabricated products, place on sloped supports above ground. Cover products subject to deterioration with impervious sheet covering; provide ventilation to avoid condensation.
- C. Store loose granular materials on solid surfaces in a well-drained area; prevent mixing with foreign matter.
- D. Arrange storage to provide access for Periodic inspection to assure products are undamaged and are maintained under required conditions.
- E. After installation, provide coverings to protect products from damage from traffic and construction operations. Remove when no longer needed.

1.8 PRODUCT OPTIONS

- A. Within 10 days after date of Contract, General Contractor is to submit a complete list of major products proposed with name of manufacturer, trade name, and model.
- B. Options:
 - 1. Products specified only by reference standards: Any product meeting that standard.
 - 2. Products specified by naming several manufacturers: Products of any named manufacturer meeting specifications.
 - 3. Products specified by naming one or more manufacturers and/or "equal": Products of any named manufacturer meeting specifications and/or any manufacturer receiving prior approval, (per Supplementary Instructions to Bidders, Paragraph 9.3 EQUAL CLAUSE). Substitutions per Paragraph 1.9, (below).
 - 4. Products specified by naming only one (1) manufacturer: Products of named manufacturer and/or any manufacturer receiving prior approval, (per Supplementary Instructions to Bidders, Paragraph 9.3 EQUAL CLAUSE). Substitutions per Paragraph 1.9, (below).

1.9 SUBSTITUTIONS

- A. No substitution will be considered after date of Contract unless a product becomes unavailable due to no fault of Contractor.

- B. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents.
- C. Request constitutes a representation that Contractor:
 - 1. Has investigated proposed product and determined that it meets or exceeds in all respects specified product.
 - 2. Will provide the same warranty for substitution as for specified Product.
 - 3. Will coordinate installation and make other changes that may be required for Work to be complete in all respects.
 - 4. Waives claims for additional cost that may subsequently become apparent.
- D. Substitutions will not be considered when they are indicated or implied on shop drawings or product data submittals without separate written request, or when acceptance will require substantial revision of Contract Documents.
- E. Architect/Engineer will determine acceptability of proposed substitution and will notify Contractor of acceptance or rejection in writing within a reasonable time.

END OF SECTION

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SECTION 01 71 23

FIELD ENGINEERING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDE

- A. General Contractor shall provide and pay for all other necessary field engineering services required for the Project.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract
- B. Section 01 11 13: Summary of Work
- C. Section 01 78 39: Project Record Documents

1.3 SURVEY REFERENCE POINTS

- A. Existing basic horizontal and vertical control points for the Project are those designated on the drawings.
- B. Locate and protect control points prior to starting site work, and preserve all permanent reference points during construction.
 - 1. Make no changes or relocations without prior written notice to Architect/Engineer.
 - 2. Report to Architect/Engineer when any reference point is lost or destroyed or requires relocation because of necessary changes in grades or locations.

1.4 PROJECT SURVEY REQUIREMENTS

- A. Establish lines and levels, locate and layout, by instrumentation and similar appropriate means:
 - 1. Building lines and floor levels.
 - 2. Controlling lines and levels required for mechanical and electrical trades.
- B. From time to time, verify layouts by same methods

1.5 RECORD

- A. Maintain a complete and accurate log of all control and survey work as it progresses.

1.6 SUBMITTALS

- A. On request of Architect/Engineer, submit documentation to verify accuracy of field engineering work.

END OF SECTION

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SECTION 01 73 29

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Contractor shall be responsible for all cutting, fitting, and patching, including attendant excavation and backfill required to complete the work or to:
 - 1. Make its several parts fit together properly.
 - 2. Uncover portions of the work to provide for installation of ill-timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Remove samples of installed work as specified for testing.
 - 6. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.

1.2 RELATED REQUIREMENTS

- A. Section 01 11 13: Summary of Work

1.3 SUBMITTALS

- A. Submit a written request to Architect/Engineer well in advance of executing any cutting or alteration which affects:
 - 1. Any separate contractor.
 - 2. Structural value or integrity of any element of the Project.
 - 3. Integrity or effectiveness of weather exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance, or safety of operational elements.
 - 5. Visual qualities of sight-exposed elements.
- B. Request shall include:
 - 1. Identification of the Project.
 - 2. Description of affected work.
 - 3. The necessity for cutting, alteration, or excavation.
 - 4. Effect on work of any separate contractor, or on structural or weatherproof integrity of Project.
 - 5. Description of proposed work:
 - a. Scope of cutting, patching, alterations, or excavation.
 - b. Trades who will execute the work.
 - c. Products proposed to be used.
 - d. Extent of refinishing to be done.
 - 6. Alternatives to cutting and patching.
 - 7. Cost proposal, when applicable.
 - 8. Written permission of any separate contractor whose work will be affected.

- C. Submit written notice to Architect/Engineer designating the date and the time the work will be uncovered.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with specifications and standards for each specific product involved.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Inspect existing conditions of Project, including elements subject to damage or to movement during cutting and patching.
- B. After uncovering work, inspect conditions affecting installation of products or performance of work.
- C. Report unsatisfactory or questionable conditions to Architect/Engineer in writing. Do not proceed with work until Architect/Engineer has provided further instructions.

3.2 PREPARATION

- A. Provide adequate temporary support as necessary to assure structural value or integrity of affected portion of work.
- B. Provide devices and methods to protect other portions of Project from damage.
- C. Provide protection from elements for portions of the Project that may be exposed by cutting and patch work and maintain excavations free from water.

3.3 PERFORMANCE

- A. Execute cutting and demolition by methods which will prevent damage to other work and will provide surfaces to receive installation of repairs.
- B. Execute excavating and backfilling by methods which will prevent settlement or damage to other work.
- C. Employ original Installer or Fabricator to perform cutting and patching for:
 - 1. Weather exposed or moisture resistant elements.
 - 2. Sight exposed finished surfaces.
- D. Execute fitting and adjustment of products to provide a finished installation to comply with specified products, functions, tolerances, and finishes.
- E. Restore work which has been cut or removed. Install new products to provide completed work in accordance with requirements of Contract documents.
- F. Fit work airtight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.
- G. Refinish entire surfaces, as necessary, to provide an even finish to match adjacent finishes:
 - 1. For continuous surfaces, refinish to nearest intersection.
 - 2. For an assembly, refinish entire unit.

END OF SECTION

SECTION 01 74 00

CLEANING

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Execute cleaning, during progress of the work and at the completion of the work, as required by General Conditions.

1.2 RELATED REQUIREMENTS

- A. Section 00 72 13: General Conditions of the Contract
- B. Each Specification Section: Cleaning for specific work.

1.3 DISPOSAL REQUIREMENTS

- A. Conduct cleaning and disposal operations to comply with codes, ordinances, regulations, and antipollution laws.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use only those cleaning materials which will not create hazards to health or property and which will not damage surfaces.
- B. Use only those cleaning materials and methods recommended by manufacturer of the surface material to be cleaned.
- C. Use cleaning materials only on surfaces recommended by cleaning material manufacturer.

PART 3 - EXECUTION

3.1 RESPONSIBILITY

- A. Contractor to be responsible for all cleaning operations.
- B. Contractor and Subcontractors shall keep the premises free from accumulations of waste materials, rubbish, and other debris resulting from his work. He shall take preservation measures and clean all finished surfaces if soiled due to his work.

3.2 DURING CONSTRUCTION

- A. Execute periodic cleaning to keep the site and adjacent properties free from accumulations of dust, waste materials, rubbish and windblown debris, resulting from construction operations.
- B. Provide on-site containers for the collection of waste materials, debris, and rubbish.

- C. Remove waste materials, debris, and rubbish from the site periodically and dispose of at legal disposal areas away from the site.

3.3 DUST CONTROL

- A. Periodically moisten soils to limit dust generation by site activities.
- B. Schedule operations so that dust and other materials will not become a nuisance to surrounding properties.

3.4 FINAL CLEANING

- A. Employ skilled workmen for final cleaning.
- B. Remove grease, dust, dirt, stains and other foreign materials from adjacent roadways/paving.
- C. Broom clean exterior paved surfaces; rake clean other surfaces of the grounds.
- C. Prior to final completion or Owner's occupancy, Contractor shall conduct an inspection of all work areas to verify that the entire site is clean.

END OF SECTION

SECTION 01 77 19

CONTRACT CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Substantial Completion.
- B. Final Completion.
- C. Re-inspection Fees.
- D. Closeout Submittals.
- E. Adjustment of Accounts.
- F. Application for Final Payment.

1.2 RELATED REQUIREMENTS

- A. Section 00 72 13: General Conditions of the Contract: Fiscal provisions, legal submittals, and additional administrative requirements.
- B. Respective Sections of Specifications: Closeout submittals for Work of the Section.

1.3 SUBSTANTIAL COMPLETION

- A. When the General Contractor considers the work or designated portion thereof is substantially complete, submit written notice with list of items to be completed or corrected.
- B. Within a reasonable time Architect/Engineer will inspect to determine status of completion.
- C. Should Architect/Engineer determine that Work is not substantially complete he will promptly notify Contractor in writing giving the reasons therefore.
- D. Contractor shall remedy deficiencies and send a second written notice of substantial completion, and Architect/Engineer will re-inspect the Work.
- E. When Architect/Engineer determines that Work is substantially complete, he will prepare a Certificate of Substantial Completion in accordance with the General Conditions of the Contract.

1.4 OCCUPANCY

- A. Owner Occupancy of Project or Designated Portion of Project:
 - 1. Owner will occupy Project under provisions stated in Certificate of Substantial Completion.
 - 2. Contractor shall complete Work listed for completion or corrections within designated time.

1.5 FINAL COMPLETION

- A. When General Contractor considers Work is complete, he shall submit written certification that:
 - 1. Contract Documents have been reviewed.
 - 2. Work has been inspected in compliance with Contract Documents.
 - 3. Work has been completed in accordance with Contract Documents, and deficiencies listed with Certificate of Substantial Completion have been corrected.
 - 4. Equipment and systems have been tested in presence of Owner's representative and are operational.
 - 5. Work is complete and ready for final inspection.
- B. Architect/Engineer will observe to verify status of completion with reasonable promptness.
- C. Should Architect/Engineer consider that Work is incomplete or defective, he will promptly notify Contractor in writing, listing incomplete or defective work.
- D. Contractor shall take immediate steps to remedy deficiencies and send a second written certification that Work is complete, and Architect/Engineer will re-observe the work.
- E. When Architect/Engineer finds Work acceptable, closeout submittals will be considered.

1.6 RE-OBSERVATION FEES

- A. Should Architect/Engineer perform re-observation due to failure of work to comply with claims made by a Contractor; Owner will compensate Architect/Engineer for such additional services and deduct the amount of such compensation from final payment of the Contractor.
 - 1. Architect will perform one (1) pre-final and one (1) final observation as agreed between the Architect and Contractor.
 - 2. Architect will charge re-observation fees for all time required to complete said re-observation (site and office time) after these two (2) observations are completed.

1.7 CLOSEOUT SUBMITTALS

- A. Evidence of compliance with requirements of governing authorities:
 - 1. Certificate of Occupancy: If required by local authority, must be obtained by Prime General Contractor.
 - 2. Certificate of Inspection: Obtained by the appropriate Contractor.
 - a. Mechanical:
 - (1) Utilities.
 - (2) Plumbing system.
 - (3) HVAC system.
 - b. Electrical:
 - (1) Distribution systems.
 - (2) Lighting systems.

- c. Emergency/Protection Systems.
 - d. Others as required by individual specification sections.
- C. Contractor to submit evidence of payment and release of liens, in accordance with General and Supplementary Conditions as follows:
 - 1. Contractor's Affidavit of Payment of Debts and Claims: AIA G706.
 - 2. Contractor's Affidavit of Release of Liens: AIA G706A, with:
 - a. Contractor's release or waiver of liens.
 - b. Separate releases or waivers of liens for Subcontractors, suppliers, and others with lien rights against property of Owner, together with list of those parties.
- D. Consent of Surety to Final Payment: AIA G707.
- E. Certificates of Insurance for Products and Completed Operations: In accordance with General Conditions.
- F. All submittals shall be in duplicate and duly executed before delivery to Architect/Engineer.

1.8 ADJUSTMENT OF ACCOUNTS

- A. General Contractor to submit a final statement of accounting, reflecting all adjustments to Contract Sum:
 - 1. Original Contract Sum.
 - 2. Additions and deductions resulting from:
 - a. Previous Change Orders.
 - b. Deductions for uncorrected work.
 - c. Deductions for re-inspection payments.
 - d. Other adjustments.
 - 3. Total Contract Sum, as adjusted.
 - 4. Previous payments.
 - 5. Sum remaining due.
- B. Architect/Engineer will issue a final Change Order, reflecting approved adjustments to the Contract Sum not previously made by Change Orders.

1.9 APPLICATION FOR FINAL PAYMENT

- A. Submit application for final payment in accordance with procedures and requirements in Conditions of the Contract.

END OF SECTION

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SECTION 01 78 23

OPERATING AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Contractor shall compile product data and related information appropriate for Owner's maintenance and operation of products furnished under the Contract.
 - 1. Prepare operating and maintenance data as specified in this Section and as referenced in other pertinent section of the specifications.
- B. Instruct Owner's personnel in maintenance of products and in operation of equipment and systems.
- C. If a combined bid is accepted, provide O/M data separately for each construction package.

1.2 RELATED REQUIREMENTS

- A. Section 01 77 19: Contract Closeout Procedures.
- B. Section 01 78 39: Project Record Documents.
- C. Section 01 78 33: Warranties and Bonds.

1.3 QUALITY ASSURANCE

- A. Preparation of data shall be done by personnel:
 - 1. Trained and experienced in maintenance and operation of described products.
 - 2. Familiar with requirements of this Section.
 - 3. Skilled as technical writer to the extent required to communicate essential data.
 - 4. Skilled as draftsman competent to prepare required drawings.

1.4 FORM OF SUBMITTALS

- A. Prepare data in the form of an instructional manual for use by Owner's personnel.
- B. Format:
 - 1. Size: 8 1/2" x 11".
 - 2. Paper: 20 pound minimum, white typing paper.
 - 3. Text: Manufacturer's printed data, or neatly typewritten.
 - 4. Drawings:
 - a. Provide reinforced punched binder tabs, bond in with text.
 - b. Fold larger drawings to size of text pages.

5. Provide fly-leaf for each separate product, or each piece of operating equipment.
 - a. Provide typed description of product and major component parts of equipment.
 - b. Provide indexed tabs.
 6. Cover: Identify each volume with typed or printed title "OPERATING AND MAINTENANCE INSTRUCTIONS". List:
 - a. Title of Project.
 - b. Identity of separate structure as applicable.
 - c. Identity of general subject matter covered in the manual.
- C. Binders:
1. Commercial quality, three-ring binders with durable and cleanable plastic covers.
 2. Maximum Ring Size: 1 inch.
 3. When multiple binders are used, correlate the data into related consistent groupings.

1.5 CONTENT OF MANUAL

- A. Neatly typewritten table of contents arranged in systematic order for each volume.
 1. Contractor and the name of responsible principal with their address and telephone number.
 2. A list of each product required to be included and indexed to content of the volume.
 3. List with each product the name, address and telephone number of:
 - a. Subcontractor or installer.
 - b. Maintenance Contractor, as appropriate.
 - c. Identify area of responsibility of each.
 - d. Local source of supply for parts and replacements.
 4. Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- B. Product Data:
 1. Include only those sheets which are pertinent to the specific product.
 2. Annotate each sheet to:
 - a. Clearly identify specific product or part installed.
 - b. Clearly identify data applicable to installation.
 - c. Delete references to inapplicable information.
- C. Drawings:
 1. Supplement product data with drawings as necessary to clearly illustrate:
 - a. Relations of component parts of equipment and systems.
 - b. Control and flow diagrams.
 2. Coordinate drawings with information in Project Record Documents to assure correct illustration of completed installation.
 3. Do not use Project Record Documents as maintenance drawings.

- D. Written text, as required, to supplement product data for the particular installation:
 - 1. Organize in consistent format under separate headings for different procedures.
 - 2. Provide logical sequence of instructions for each procedure.
- E. Copy of each warranty, bond, and service contract issued.
 - 1. Provide procedures in event of failure.
 - a. Proper procedures in event of failure.
 - b. Instance which might affect validity of warranties or bonds.

1.6 MANUAL FOR MATERIALS AND FINISHES

- A. Submit two (2) copies of complete manual in final form.
- B. Content: For architectural products, applied materials, and finishes:
 - 1. Manufacturer's data, giving full information on products.
 - a. Catalog number, size, and composition.
 - b. Color and texture designations.
 - c. Information required for re-ordering special manufactured products.
 - 2. Instructions for care and maintenance.
 - a. Manufacturer's recommendation for types of cleaning agents and methods.
 - b. Cautions against cleaning agents and methods which are detrimental to product.
 - c. Recommended schedule for cleaning and maintenance.
- C. Content for moisture-protection and weather-exposed products:
 - 1. Manufacturer's data, giving full information on product.
 - a. Applicable standards.
 - b. Chemical composition.
 - c. Details of installation.
 - 2. Instructions for inspection, maintenance, and repair.
- D. Additional Requirements for Maintenance Data: Respective sections of specs.
- E. Provide complete information for products specified in various sections of the Project Manual as designated by the Architect/Engineer.

1.7 MANUAL FOR EQUIPMENT AND SYSTEMS

- A. Submit three (3) copies of complete manual in final form.
- B. Content for each unit of equipment and system as appropriate:
 - 1. Description of unit and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 - 2. Operating Procedures:
 - a. Start-up, break-in, routine, and normal operating instructions.
 - b. Regulation, control, stopping, shut-down, and emergency instructions.
 - c. Summer and winter operating instructions.
 - d. Special operating instructions.

3. Maintenance Procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassemble, repair, and reassemble.
 - d. Alignment adjustment and checking.
 4. Servicing and lubrication schedule:
 - a. List of lubricants required.
 5. Manufacturer's printed operating and maintenance instructions.
 6. Description of sequence of operation by control manufacturer.
 7. Original manufacturer's parts' list, illustrations, assembly drawings, and diagrams required for maintenance.
 - a. Predicted life of parts subject to wear.
 - b. Items recommended to be stocked as spare parts.
 8. As-installed control diagrams by controls manufacturer.
 9. Each Contractor's coordination drawings.
 - a. As-installed color-coded piping diagrams.
 10. Charts of valve tag numbers with location and function of each valve.
 11. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
 12. Other data as required under pertinent sections of the specifications.
- C. Contents for each electric and electronic system, as appropriate:
1. Description of system and component parts.
 - a. Function, normal operating characteristics, and limiting conditions.
 - b. Performance curves, engineering data, and tests.
 - c. Complete nomenclature and commercial number of replaceable parts.
 2. Circuit directories of panelboards.
 - a. Electrical service.
 - b. Controls.
 - c. Communications.
 3. As-installed color-coded wiring diagrams.
 4. Operating procedures:
 - a. Routine and normal operating instructions.
 - b. Sequences required.
 - c. Special operating instructions.
 5. Maintenance procedures:
 - a. Routine operations.
 - b. Guide to "trouble-shooting".
 - c. Disassembly, repair, and reassembly.
 - d. Adjustment and checking.
 6. Manufacturer's printed operating and maintenance instructions.
 7. List of original manufacturer's spare parts, manufacturer's current prices, and recommended quantities to be maintained in storage.
 8. Other data as required under pertinent sections of specifications.
- D. Prepare and include additional data when the need for such data becomes apparent during instructions of Owner's personnel.

- E. Additional Requirements for "Operating and Maintenance Data": Respective sections of the specifications.
- F. Provide complete information for products specified in:
 - 1. Mechanical and Electrical Divisions.

1.8 SUBMITTAL SCHEDULE

- A. Submit two copies of preliminary draft of proposed formats and outlines of contents prior to start of work.
 - 1. Architect/Engineer will review draft and return one copy with comments.
- B. Submit one copy of completed data in final form 15 days prior to final inspection or acceptance.
 - 1. Copy will be returned after final inspection or acceptance, with comments
- C. Submit specified number of copies of approved data in final form ten (1) days after final inspection or acceptance.

1.9 INSTRUCTION OF OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct Owner's designated operating and maintenance personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Operating and maintenance manual shall constitute the basis of instructions.
 - 1. Review contents of manual with personnel in full detail to explain all aspects of operations and maintenance.

END OF SECTION

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SECTION 01 78 33

WARRANTIES AND BONDS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. General Contractor to submit warranties and bonds as required by this Section.
- B. Compile specified warranties and bonds.
- C. Compile specified service and maintenance contracts.
- D. Co-execute submittals when so specified.
- E. Review submittals to verify compliance with Contract Documents.
- F. Submit to Architect/Engineer for review and transmittal to Owner.

1.2 RELATED REQUIREMENTS

- A. Conditions of the Contract: General Warranty of Construction.
- B. Section 01 77 19: Contract Closeout Procedures.
- C. Section 01 78 23: Operation & Maintenance Data.
- D. Each Respective Section of Specifications as Listed Below: Warranties and Bonds Required for Specific Products.
- E. The Respective Section of Specifications which Specifies the Product: Provisions of Warranties and Bonds, Duration.

1.3 SUBMITTAL REQUIREMENTS

- A. Assemble warranties, bonds, and service and maintenance contracts executed by each of the respective manufacturers, suppliers, and Subcontractors.
- B. Number of Original Signed Copies Required: **Three (3) each**. Bind into Maintenance Manuals.
- C. Table of Contents: Neatly typed, in order sequence. Provide complete information for each item.
 - 1. Product or work item.
 - 2. Firm with name of principal, address and telephone number.
 - 3. Scope.
 - 4. Date of beginning of warranty, bond or service and maintenance contract.
 - 5. Duration of warranty, bond or service maintenance contract.
 - 6. Provide information for Owner's personnel:
 - a. Proper procedure in case of failure.
 - b. Instances which might affect the validity of warranty or bond.
 - 7. Contractor, name of responsible principal, address and telephone number.

1.4 FORM OF SUBMITTALS

- A. Prepare in duplicate packets.

- B. Format:
 - 1. Size: 8½" X 11", punched sheets for 3-ring binder.
 - a. Fold larger sheets to fit into binders.
 - 2. Cover: Identify each packet with typed or printed title "WARRANTIES AND BOND". List:
 - a. Title of Project.
 - b. Name of Contractor.
- C. Binders: Commercial quality, 3-ring, with durable and cleanable plastic covers.

1.5 TIME OF SUBMITTALS

- A. Make submittals within ten (10) days after date of substantial completion, prior to final request for payment.
- B. For items of work, where acceptance is delayed materially beyond date of substantial completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as start of warranty period.

1.6 SUBMITTALS REQUIRED

- A. Submit warranties, bonds, and service and maintenance contracts as specified in respective sections of specifications.

END OF SECTION

SECTION 01 78 39

PROJECT RECORD DOCUMENTS

PART 1 - GENERAL

1.1 REQUIREMENTS INCLUDED

- A. Maintain at the site for the Owner one (1) copy of:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Architect/Engineer Field Orders or written instructions.
 - 6. Approved Shop Drawings and Product Data.
 - 7. Approved samples.
 - 8. Field test records.

1.2 RELATED REQUIREMENTS

- A. Section 01 77 19: Contract Closeout Procedures.

1.3 MAINTENANCE OF DOCUMENTS AND SAMPLES

- A. Store documents apart from documents used for construction.
 - 1. Provide secure space for storage of documents.
- B. File documents and samples in accordance with CSI/CSC format.
- C. Maintain documents up-to-date in a clean, dry, legible condition and in good order. Do not use documents for construction purposes.
- D. Make documents available at all times for inspection by Architect/Engineer.

1.4 MARKING DEVICES

- A. Provide felt tip marking pens for recording information in a color code verified with Architect or as follows:

1.5 RECORDING

- A. Record information concurrently with construction progress.
 - 1. Do not conceal any work until required information is recorded.
- B. Drawings - Legible marked to record actual construction:
 - 1. Field changes of dimension and detail.
 - 2. Changes made by Field Order or by Change Order.
 - 3. Details not on original Contract Drawings.
- C. Specifications and Addenda - Legibly mark each Section to record:
 - 1. Changes made by Field Order or by Change Order.

1.6 SUBMITTAL

- A. At Contract close-out, deliver one (1) paper record copy (plans and specs) and one (1) electronic scanned record copy (plans and specs) to Architect/Engineer for the Owner.
- B. Accompany submittal with transmittal letter in duplicate, containing:
 - 1. Date.
 - 2. Project title and number
 - 3. Contractor's name and address.
 - 4. Title and number of each Record Document.
 - 5. Signature of Contractor or his authorized representative.

END OF SECTION

SECTION 02 41 19

MINOR DEMOLITION & SALVAGE (Bid Package B only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Refer to plans for specific items to be covered by these specifications. Refer to corresponding drawings for the civil, mechanical and electrical items to be included under this Section.
- B. Salvage items indicated and store for reuse or deliver to the Owner as indicated.
- C. Protection of salvaged and moved items during completion of new work.
- D. Work required under the following Bid Package generally includes:
 - 1. Bid Package B – Pedestrian Bridge Repair
 - a. Bridge structure and concrete removal
 - b. Salvage of existing bridge structure as described on drawings
 - c. Removal of existing guardrails
 - d. Removal of existing masonry as needed to complete wall repairs

1.2 RELATED WORK

- A. Section 01 11 13: Summary of Work
- B. Section 01 50 00: Temporary Facilities and Controls

1.3 SUBMITTALS

- A. Demolition procedures and operational sequence for review and acceptance by Architect/Engineer.

1.4 PROTECTION

- A. Do not interfere with use of existing building to remain. Maintain free and safe passage to and from the existing premises.
- B. Cease operations and notify the Architect/Engineer immediately if safety of structure appears to be endangered. Take precautions to properly support structure. Do not resume operations until safety is restored.
- C. Provide, erect, and maintain barricades, lighting, and guardrails, as required, to protect occupants of building and workers.
- D. Properly protect items to remain and salvaged items to be reincorporated into the work. Repair back to existing condition or replace if damaged.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Except where noted otherwise, maintain possession of materials being demolished and immediately remove from site.

PART 3 - EXECUTION

3.1 DEMOLITION

- A. The term demolition, as used herein, includes the complete removal of all existing objects as noted on the drawings.
- B. Remove miscellaneous items as indicated on the drawings or as otherwise necessary to execute the work of the Project.
- C. Demolish in an orderly and careful manner as required to accommodate new work.
- D. Protect existing, supporting, structural members. Repair damage.
- E. Repair all demolition performed in excess of that required at no cost to the Owner.
- F. Burning of materials on site is not permitted.
- G. Remove from the site contaminated, vermin infested or dangerous material encountered and dispose of by safe means so as not to endanger health of workers and public.
- H. Remove demolished materials, tools, and equipment from site upon completion of work. Leave site in a condition acceptable to the Architect/Engineer.
- I. Repair damaged areas to the grounds (wheel tracks, etc.) caused by vehicles used in performance of this Contract.

3.2 SALVAGE FOR REUSE

- A. Salvaged items to be reincorporated into the new work shall be removed, stored and reinstalled by the contractor. Protect from damage during all phases of the work.
 - a. Bridge structural elements for reuse under Bid Package B

END OF SECTION

SECTION 03 05 16

UNDERSLAB VAPOR BARRIER (Bid Package A only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Sheet vapor barrier under concrete slabs on grade.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: Preparation of subgrade, granular fill, placement of concrete, reinforcing and formwork.

1.03 REFERENCE STANDARDS

- A. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2011.
- B. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2011.

1.04 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products.
- C. Samples: Submit samples of underslab vapor barrier to be used.
- D. Manufacturer's Installation Instructions: Indicate installation procedures and interface required with adjacent construction.

PART 2 PRODUCTS

2.01 MATERIALS

- A. Underslab Vapor Barrier:
 - 1. Water Vapor Permeance: Not more than 0.010 perms, maximum.
 - 2. Complying with ASTM E1745 Class A and mandatory conditioning testing.
 - a. Provide testing study results showing that products meet the .01 perm rating requirement.
 - 3. Thickness: 15 mils.
 - 4. Basis of Design:
 - a. Stego Industries LLC; Stego Wrap Vapor Barrier (15-mil):
www.stegoindustries.com/#sle.
 - 5. Acceptable manufacturers:
 - a. W.R. Grace & Co.
 - b. VB-350 by Barrier-Bac
 - c. Premoulded Membrane with Plasmatic Core W.R. Meadows, Inc.
 - d. Fortifiber Building Systems Group
 - e. ISI Building Products

- f. Vaporgaurd by Reef Industries
 - g. VaporBlock 15 by Raven
- B. Accessory Products: Vapor barrier manufacturer's recommended tape, adhesive, mastic, etc., for sealing seams and penetrations in vapor barrier.
- a. Tack Tape or Crete Claw by Stego Industries
 - b. Equivalent products by other manufacturers.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that surface over which vapor barrier is to be installed is complete and ready before proceeding with installation of vapor barrier.

3.02 INSTALLATION

- A. Install vapor barrier in accordance with manufacturer's instructions and ASTM E1643.
- B. Level and compact base material.
- C. Install vapor barrier under interior slabs on grade; lap sheet over footings and seal to foundation walls.
- 1. Extend vapor barrier to the perimeter of the slab. If practicable, terminate it at the top of the slab, otherwise (a) at a point acceptable to the structural engineer or (b) where obstructed by impediments (such as dowels, waterstops, or any other site condition requiring early termination of the vapor barrier). At the point of termination, seal vapor barrier to the foundation wall, grade beam or slab itself.
 - 2. Where indicated, extend vapor barrier down foundation wall to footing at raised platform in Gym 166.
- D. Lap joints minimum 6 inches.
- E. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions.
- F. No penetration of vapor barrier is allowed except for reinforcing steel and permanent utilities.
- G. Repair damaged vapor retarder before covering with other materials.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE CONCRETE (Bid Packages A and B)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Topping slabs and slabs on grade.
- B. Concrete foundation walls, stoops and piers.
- C. Concrete reinforcement.
- D. Joint devices associated with concrete work.
- E. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, thrust blocks, manholes, etc.
- F. Concrete curing.
- G. Work required under the following Bid Packages:
 - 1. Bid Package A – Bus Barn
 - 2. Bid Package B – Pedestrian Bridge Repair

1.02 RELATED REQUIREMENTS

- A. Section 01 45 33 - Code-Required Special Inspections and Procedures: for Field Quality Control testing and inspecting requirements
- B. Section 03 05 16 - Underslab Vapor Barrier: for use under slabs-on-grade.
- C. Section 03 41 00 – Precast Structural Concrete.
- D. Section 05 12 00 – Structural Steel.
- E. Section 05 90 98 – Miscellaneous Metals.
- F. Section 05 90 99 – Miscellaneous Metals.
- G. Section 07 21 16 – Thermal Insulation.
- H. Section 07 92 00 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.
- I. Section 09 91 23 - Painting & Coatings: Products for Penetrating Sealers and Liquid Densifiers for Concrete Topping Slab
- J. Section 31 20 00 – Earth Moving for Building Pad
- K. Refer to Civil Drawings for reference to other applicable specifications.
- L. SUDAS standards for exterior paving and concrete work.

1.03 REFERENCE STANDARDS

- A. ACI 117 - Specification for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).
- B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete 1991 (Reapproved 2009).

- C. ACI 301 - Specifications for Concrete Construction 2020.
- D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.
- E. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete 2000 (Reapproved 2009).
- F. ACI 305R - Guide to Hot Weather Concreting 2020.
- G. ACI 306R - Guide to Cold Weather Concreting 2016.
- H. ACI 308R - Guide to External Curing of Concrete 2016.
- I. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
- J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2022.
- K. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars 2019.
- L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2018a.
- M. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.
- N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.
- O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2022.
- P. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.
- Q. ASTM C150/C150M - Standard Specification for Portland Cement 2022.
- R. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).
- S. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019, with Editorial Revision (2022).
- T. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2022.
- U. ASTM C845/C845M - Standard Specification for Expansive Hydraulic Cement 2018.
- V. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.
- W. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2021.
- X. ASTM C1116/C1116M - Standard Specification for Fiber-Reinforced Concrete 2010a (Reapproved 2015).
- Y. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures 2020.

- Z. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete 2018.
- AA. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers 2020.
- BB. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric) 2014.
- CC. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2018a.

1.04 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
- C. Mix Design: Submit proposed concrete mix design.
 - 1. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
 - 2. Indicate proposed mix design complies with requirements of ACI 301, Section 4 - Concrete Mixtures.
 - 3. Indicate proposed mix design complies with requirements of ACI 318, Chapter 5 - Concrete Quality, Mixing and Placing.
 - 4. Indicate proposed mix design complies with fiber reinforcing manufacturer's written recommendations.
 - 5. Indicate proposed mix design complies with admixture manufacturer's written recommendations.
 - 6. Indicate amounts of mixing water to be withheld for later addition at Project site.
- D. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.
- E. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.
 - 1. Location of construction joints is subject to approval of the Architect.
- F. Test Reports: Submit report for each test or series of tests specified.
- G. Project Record Documents: Accurately record actual locations of embedded utilities and components that will be concealed from view upon completion of concrete work.

1.05 INFORMATIONAL SUBMITTALS

- A. Welding certificates.
- B. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
 2. Admixtures.
 3. Form materials and form-release agents.
 4. Steel reinforcement and accessories.
 5. Fiber reinforcement.
 6. Waterstops.
 7. Curing compounds.
 8. Floor and slab treatments.
 9. Bonding agents.
 10. Adhesives.
 11. Vapor retarders.
 12. Semi-rigid joint filler.
 13. Joint-filler strips.
 14. Repair materials.
- C. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:
1. Aggregates:
 - a. Include service record data indicating absence of deleterious expansion of concrete due to alkali aggregate reactivity.
 - b. Include service record data indicating absence of deleterious expansion of concrete due to porous aggregate resulting in trapped moisture.
- D. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.
- E. Field quality-control reports.
- F. Minutes of pre-installation conference.

1.06 QUALITY ASSURANCE

- A. Perform work of this section in accordance with ACI 301 and ACI 318.
 1. Maintain one copy of each document on site.
- B. Perform work of this section in accordance with ACI 317.
- C. Follow recommendations of ACI 305R when concreting during hot weather.
- D. Follow recommendations of ACI 306R when concreting during cold weather.
- E. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.
- F. 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.
 1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

- G. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C 1077 and ASTM E 329 for testing indicated.
 - 1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.
 - 2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.
- H. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.
 - 1. All sand and fine and coarse aggregate to be imported and free from porous material such as, but not limited to, ironstone, coal, shale, or porous limestone.
- I. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D 1.4M, "Structural Welding Code - Reinforcing Steel."
- J. Concrete Testing Service: Owner shall engage a qualified independent testing agency to perform material evaluation tests.
- K. Preinstallation Conference: Conduct conference at Project site.
 - 1. Before submitting design mixtures, review concrete design mixture and examine procedures for ensuring quality of concrete materials. Require representatives of each entity directly concerned with cast-in-place concrete to attend, including the following:
 - a. Contractor's superintendent.
 - b. Independent testing agency responsible for concrete design mixtures.
 - c. Ready-mix concrete manufacturer.
 - d. Concrete subcontractor.
 - 2. Review special inspection and testing and inspecting agency procedures for field quality control, concrete finishes and finishing, cold- and hot-weather concreting procedures, curing procedures, construction contraction and isolation joints, and joint-filler strips, semi-rigid joint fillers, forms and form removal limitations, vapor-barrier installation, anchor rod and anchorage device installation tolerances, steel reinforcement installation, floor and slab flatness and levelness measurement, concrete repair procedures, and concrete protection.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage.
- B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 PRODUCTS

2.01 FORMWORK

- A. Formwork Design and Construction: Comply with guidelines of ACI 347R to provide formwork that will produce concrete complying with tolerances of ACI 117.
- B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
 - 1. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.

2.02 REINFORCEMENT MATERIALS

- A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Type: Deformed billet-steel bars.
 - 2. Finish: Unfinished, unless otherwise indicated.
- B. Steel Welded Wire Reinforcement (WWR): Class A epoxy coated, deformed type, ASTM A884/A884M.
 - 1. Form: Flat Sheets.
 - 2. WWR Style: As indicated on drawings.
- C. Reinforcement Accessories:
 - 1. Tie Wire: Annealed, minimum 16-gauge, 0.0508 inch.
 - 2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.03 CONCRETE MATERIALS

- A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
 - 1. Acquire cement for entire project from same source.
- B. Blended, Expansive Hydraulic Cement: ASTM C845/C845M, Type K.
- C. Fine and Coarse Aggregates: ASTM C33/C33M.
 - 1. Acquire aggregates for entire project from same source.
- D. Fly Ash: ASTM C618, Class C or F.
- E. Ground granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
- F. Silica Fume: ASTM C1240, proportioned in accordance with ACI 211.1.
- G. Normal-Weight Aggregates: ASTM C 33, Class 3S coarse aggregate or better, graded. Provide aggregates from a single source with documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.
 - 1. Maximum Coarse-Aggregate Size: Refer to concrete mixtures.
 - 2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement.
- H. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.
- I. Structural Fiber Reinforcement: ASTM C1116/C1116M.
 - 1. Fiber Type: Alkali-resistant synthetic.

2. Products:
 - a. Euclid Chemical Company; TUF-STRAND: www.euclidchemical.com/#sle.
 - b. Fibermesh; Fibermesh 650: www.fibermesh.com/#sle.
 - c. Forta Corporation; FORTA-FERRO (2-1/4"): www.forta-ferro.com/#sle.
 - d. GCP Applied Technologies; STRUX 90/40: www.gcpat.com/#sle.

2.04 ADMIXTURES

- A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.
- 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.
- C. Air Entrainment Admixture: ASTM C260/C260M.
- D. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.
- E. High Range Water Reducing Admixture: ASTM C494/C494M Type F.
- F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.
- G. Accelerating Admixture: ASTM C494/C494M Type C.
- H. Retarding Admixture: ASTM C494/C494M Type B.
- I. Water Reducing Admixture: ASTM C494/C494M Type A.
- J. Plasticizing and Retarding Admixture: ASTM C 1017/C 1017M, Type II.

2.05 ACCESSORY MATERIALS

- A. Expansion- and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber.
- B. Semirigid Joint Filler: Two-component, semirigid, 100 percent solids, epoxy resin with a Type A shore durometer hardness of 80 per ASTM D 2240.
- C. Bonding Agent: ASTM C 1059/C 1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.
- D. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
 1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.06 REPAIR MATERIALS

- A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch and that can be feathered at edges to match adjacent floor elevations.
 1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by underlayment manufacturer.
 4. Compressive Strength: Not less than 5000 psi at 28 days when tested according to ASTM C 109/C 109M.
- B. Repair Overlayment: Traffic-bearing, cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/4 inch and that can be filled in over a scarified surface to match adjacent floor elevations.
1. Cement Binder: ASTM C 150, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C 219.
 2. Primer: Product of topping manufacturer recommended for substrate, conditions, and application.
 3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch or coarse sand as recommended by topping manufacturer.
 4. Compressive Strength: Not less than 5700 psi at 28 days when tested according to ASTM C 109/C 109M.

2.07 BONDING AND JOINTING PRODUCTS

- A. Latex Bonding Agent: Non-redisersable acrylic latex, complying with ASTM C1059/C1059M, Type II.
- B. Epoxy Bonding System:
 1. Complying with ASTM C881/C881M and of Type required for specific application.
- C. Waterstops: Bentonite and butyl rubber.
- D. Waterstops, Chemical-Resistant: Extruded, thermoplastic, virgin rubber; no recycled or reclaimed material or pigments allowed.
- E. Slab Isolation Joint Filler: 1/2 inch thick, height equal to slab thickness, with removable top section that will form 1/2 inch deep sealant pocket after removal.
- F. Plate Dowel System: Steel plate dowel and plastic dowel sleeve; with integral fasteners for attachment to formwork.

2.08 CURING MATERIALS

- A. Curing and Sealing Compound, High Gloss: Liquid, membrane-forming, clear, non-yellowing acrylic; complying with ASTM C1315 Type 1 Class A.
 1. VOC Content: Ozone Transport Commission (OTC) compliant.
 2. Products:
 - a. Conspec by Dayton Superior; Sealcure 1315 WB.
 - b. Euclid Chemical Company (The), an RPM company; Super Diamond Clear VOX; LusterSeal WB 300.
 - c. L&M Construction Chemicals, Inc.; Lumiseal WB Plus.
 - d. W. R. Meadows, Inc; VOCOMP-30: www.wrmeadows.com/#sle.
- B. Moisture-Retaining Sheet: ASTM C171.
 1. Curing paper, regular.

2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch.
 3. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard.
- C. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch thick, clear.
- D. Water: Potable, not detrimental to concrete.

2.09 CONCRETE MIX DESIGN

- 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.
1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.
- B. Cementitious Materials: Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:
1. Fly Ash: 25 percent.
 - a. Slab-on-grade receiving Permeability-reducing cure coat to have fly ash limited to 20 percent.
 2. Ground Granulated Blast-Furnace Slag: 20 percent.
 3. Combined Fly Ash and Ground Granulated Blast-Furnace Slag: 30 percent portland cement minimum, with fly ash not exceeding 25 percent.
 4. Silica Fume: 10 percent.
 5. Combined Fly Ash and Silica Fume: 35 percent with fly ash not exceeding 25 percent and silica fume not exceeding 10 percent.
- C. Limit water-soluble, chloride-ion content in hardened concrete to 0.15 percent by weight of cement.
- D. Admixtures: Add acceptable admixtures as recommended in ACI 211.1 and at rates recommended or required by manufacturer.
1. Use water-reducing high-range water-reducing or plasticizing admixture in concrete, as required, for placement and workability.
 2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.
 3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.
 4. Use corrosion-inhibiting admixture in concrete mixtures where indicated.
- E. Fiber Reinforcement: Add to mix at rate of 1.5 pounds per cubic yard, or as recommended by manufacturer for specific project conditions.

2.10 CONCRETE MIXTURES FOR BUILDING ELEMENTS

- A. Footings: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.

3. Slump Limit: 4 to 8 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: Air entrainment not required.
 5. Maximum Aggregate Size: 1 inch.
- B. Foundation Walls: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4000 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.50.
 3. Slump Limit: 4 to 8 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.
 5. Maximum Aggregate Size: 3/4 inch.
- C. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 5000 psi at 28 days.
 2. Minimum Cementitious Materials Content: 470 lb/cu. yd.
 3. Maximum Water-Cementitious Materials Ratio: 0.45.
 4. Slump Limit: 4 inches, plus or minus 1 inch.
 5. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.
 6. Maximum Aggregate Size: 3/4 inch.
 7. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 5 lb/cu. yd.
- D. Concrete Toppings at Precast Deck: Proportion normal-weight concrete mixture as follows:
1. Minimum Compressive Strength: 4500 psi at 28 days.
 2. Maximum Water-Cementitious Materials Ratio: 0.45.
 3. Slump Limit: 4 to 8 inches for concrete with verified slump of 2 to 4 inches before adding high-range water-reducing admixture or plasticizing admixture.
 4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery.
 5. Maximum Aggregate Size: 3/8 inch.
 6. Synthetic Macro-Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than 4 lb/cu. yd.

2.11 MIXING

- A. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.
- B. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C 94/C 94M and ASTM C 1116/C 1116M 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.

- C. Project-Site Mixing: Measure, batch, and mix concrete materials and concrete according to ASTM C 94/C 94M. Mix concrete materials in appropriate drum-type batch machine mixer.
 - 1. For mixer capacity of 1 cu. yd. or smaller, continue mixing at least 1-1/2 minutes, but not more than 5 minutes after ingredients are in mixer, before any part of batch is released.
 - 2. For mixer capacity larger than 1 cu. yd., increase mixing time by 15 seconds for each additional 1 cu. yd.
 - 3. Provide batch ticket for each batch discharged and used in the Work, indicating Project identification name and number, date, mixture type, mixture time, quantity, and amount of water added. Record approximate location of final deposit in structure.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

- A. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
 - 1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.
 - 2. Use latex bonding agent only for non-load-bearing applications.
- B. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches. Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
- C. Exterior paving: Prepare earthwork per geotechnical soils investigation report requirements. See also architectural details.

3.03 PLACING CONCRETE

- A. Place concrete in accordance with ACI 304R.
- B. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- C. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.
- D. Place concrete for floor slabs in accordance with ACI 302.1R.
- E. Finish floors level and flat, unless otherwise indicated, within the tolerances specified below.
- F. Perform exterior concrete work/jointing per SUDAS standards and architectural details.

3.04 SLAB JOINTING

- A. Locate joints as indicated on drawings.
- B. Anchor joint fillers and devices to prevent movement during concrete placement.
- C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
 - 1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.
- D. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 3/16 inch thick blade and cut at least 1 inch deep but not less than one quarter (1/4) the depth of the slab.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

- A. An independent testing agency, as specified in Section 01 40 00, will inspect finished slabs for compliance with specified tolerances.
- B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values:
 - 1. Exposed to View and Foot Traffic: F(F) of 20; F(L) of 15, on-grade only.
 - 2. Under Thick-Bed Tile: F(F) of 20; F(L) of 15, on-grade only.
 - 3. Under Carpeting: F(F) of 25; F(L) of 20, on-grade only.
 - 4. Under Thin Resilient Flooring and Thinset Tile: F(F) of 35; F(L) of 25, on-grade only.
 - 5. Parking Structure: F(F) of 20; F(L) of 15, on-grade only.
- C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.
- D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.
- E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

- A. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch or more in height. Provide finish as follows:
 - 1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
- B. Concrete Slabs: Finish to requirements of ACI 302.1R, and as follows:
 - 1. Other Surfaces to Be Left Exposed: Trowel as described in ACI 302.1R, minimizing burnish marks and other appearance defects.
- C. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1:100 nominal.

- D. Exterior Paving: light broom finish. If installed near existing paving, broom finish to match finish of adjacent paving.

3.07 CURING AND PROTECTION

- A. Comply with requirements of ACI 308R. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
 - 1. Normal concrete: Not less than seven days.
- C. Surfaces Not in Contact with Forms:
 - 1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
 - 2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water-fog spray or saturated burlap.
 - 3. Final Curing: Begin after initial curing but before surface is dry.
 - 4. Curing per SUDAS standards for exterior paving work.

3.08 PENETRATING SEALER

- A. See Section 09 91 23 for Penetrating Water Repellent Sealer that is to be applied to the concrete topping slab at pedestrian bridge repair.

3.09 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 45 33 – Code Required Special Inspections.
- B. Provide free access to concrete operations at project site and cooperate with appointed firm.
- C. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cubic yards or less of each class of concrete placed.
- D. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
- E. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.10 DEFECTIVE CONCRETE

- A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.
- B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

- C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.
- D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.11 PROTECTION

- A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 03 41 00

PRECAST STRUCTURAL CONCRETE (Bid Package B only)

PART 1 – GENERAL

1.01 SECTION INCLUDES

- A. Solid precast planks.
- B. Grout packing.
- C. Connection devices.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 - Cast-in-Place Concrete: For concrete topping.

1.03 REFERENCE STANDARDS

- A. ACI 318 - Building Code Requirements for Structural Concrete 2019, with Errata (2021).
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- C. ASTM A416/A416M - Standard Specification for Low-Relaxation, Seven-Wire Steel Strand for Prestressed Concrete 2018.
- D. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2020.
- E. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars 2019.
- F. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2018a.
- G. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2019.
- H. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars 2018a.
- I. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures 2020.
- J. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars 2021.
- K. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- L. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2021).
- M. IAS AC157 - Accreditation Criteria for Fabricator Inspection Programs for Reinforced and Precast/Prestressed Concrete 2017.
- N. PCI MNL-116 - Manual for Quality Control for Plants and Production of Structural Precast Concrete Products 2021.

- O. PCI MNL-123 - Connections Manual: Design and Typical Details of Connections for Precast and Prestressed Concrete 1988.
- P. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction 2000.

1.04 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Product Data: Indicate standard component configurations, design loads, deflections, cambers, and bearing requirements.
- C. Shop Drawings: Indicate layout, unit locations, fabrication details, unit identification marks, reinforcement, connection details, support items, dimensions, openings, and relationship to adjacent materials. Indicate design loads, deflections, cambers, bearing requirements, and special conditions.
- D. Designer's Qualification Statement.
- E. Fabricator's Qualification Statement.
- F. Erector's Qualification Statement.
- G. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.05 QUALITY ASSURANCE

- A. Designer Qualifications: Design precast concrete members under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in the State in which the Project is located.
- B. Fabricator Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- C. Erector Qualifications: Company specializing in erecting products of this section with not less than three years documented experience.
- D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Handle precast members in position consistent with their shape and design. Lift and support only from support points.
- B. Lifting or Handling Devices: Capable of supporting member in positions anticipated during manufacture, storage, transportation, and erection.
- C. Protect members to prevent staining, chipping, or spalling of concrete.
- D. Mark each member with date of production and final position in structure.

PART 2 PRODUCTS

2.01 PRECAST UNITS

- A. Solid Precast Structural Concrete Planks: Comply with PCI MNL-116, PCI MNL-120, PCI MNL-123, PCI MNL-135, ACI 318 and applicable codes.
 - 1. Design components to withstand dead loads and design loads in the configuration indicated on drawings.
 - 2. Calculate structural properties of framing members in accordance with ACI 318.
 - 3. Design members exposed to the weather to provide for movement of components without damage, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to seasonal or cyclic day/night temperature ranges.
 - 4. Design system to accommodate construction tolerances, deflection of other building structural members and clearances of intended openings.

2.02 MATERIALS

- A. Cement: White Portland type, complying with ASTM C150/C150M, Type I.
- B. Other Cementitious Materials:
 - 1. Fly Ash or Natural Pozzolans: Comply with ASTM C618.
 - 2. Ground Granulated Blast Furnace Slag: ASTM C989/C989M.
 - 3. Silica Fume: Comply with ASTM C1240.
- C. Aggregate, Sand, Water, Admixtures: Determined by precast fabricator as appropriate to design requirements and PCI MNL-116.

2.03 REINFORCEMENT

- A. Tensioning Steel Tendons: ASTM A416/A416M, Grade 250 (1725); seven-wire stranded steel cable; low-relaxation type; full length without splices; weldless; uncoated.
- B. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi).
 - 1. Deformed billet-steel bars.
 - 2. Epoxy coated in accordance with ASTM A775/A775M.
- C. Steel Welded Wire Reinforcement: ASTM A1064/A1064M plain type or deformed type; in flat sheets; galvanized.

2.04 FABRICATION

- A. Comply with fabrication procedures specified in PCI MNL-116.
- B. Fabricate and handle epoxy-coated reinforcing bars in accordance with ASTM D3963/D3963M.
- C. Maintain plant records and quality control program during production of precast members. Make records available upon request.
- D. Ensure reinforcing steel, anchors, inserts, plates, angles, and other cast-in items are embedded and located as indicated on shop drawings.
- E. Tension reinforcement tendons as required to achieve design load criteria.

- F. Exposed Ends at Stressing Tendons: Fill recess with non-shrink grout, trowel flush.

2.05 FABRICATION TOLERANCES

- A. Comply with fabrication tolerances specified in PCI MNL-135.

2.06 FINISHES

- A. Ensure exposed-to-view finish surfaces of precast concrete members are uniform in color and appearance.
- B. Cure members under identical conditions to develop required concrete quality, and minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
- C. Finish members to PCI MNL-116 Commercial grade.

2.07 ACCESSORIES

- A. Connecting and Supporting Devices; Anchors and Inserts: Plates, angles, items cast into concrete, items connected to steel framing members, and inserts complying with PCI MNL-123 and as follows:
 - 1. Material: Carbon steel complying with ASTM A36/A36M.
 - 2. Finish: Prime painted, except where device surfaces will be in contact with concrete or will require field welding.
- B. Grout: Non-shrink, non-metallic, minimum yield strength of 10,000 psi at 28 days.
- C. Prime Paint: Zinc rich alkyd type.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that site conditions are ready to receive work and field measurements are as indicated on shop drawings.

3.02 PREPARATION

- A. Prepare support equipment for the erection procedure, temporary bracing, and induced loads during erection.

3.03 ERECTION

- A. Erect members without damage to structural capacity, shape, or finish. Replace or repair damaged members.
- B. Align and maintain uniform horizontal and vertical joints, as erection progresses.
- C. Maintain temporary bracing in place until final support is provided. Protect members from staining.
- D. Provide temporary lateral support to prevent bowing, twisting, or warping of members.
- E. Adjust differential camber between precast members to tolerance before final attachment.
- F. Secure units in place. Perform welding in accordance with AWS D1.1/D1.1M.

3.04 TOLERANCES

- A. Erect members level and plumb within allowable tolerances.
- B. Comply with PCI MNL-135 for erection tolerances.
- C. When members cannot be adjusted to comply with design or tolerance criteria, cease work and advise Architect. Execute modifications as directed.

3.05 PROTECTION

- A. Protect members from damage caused by field welding or erection operations.
- B. Provide non-combustible shields during welding operations.

3.06 CLEANING

- A. Clean weld marks, dirt, or blemishes from surface of exposed members

END OF SECTION

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SECTION 04 10 00

MORTAR AND MASONRY GROUT (Bid Package B only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Mortar for masonry patching (Bid Package B)

1.02 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry: Installation of mortar and grout.
- B. Section 04 22 01 – Masonry Patching.

1.03 REFERENCE STANDARDS

- A. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2018.
- B. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.
- C. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022.
- D. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- E. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- F. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
- G. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- H. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar; 2015.
- I. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
- J. ASTM C476 - Standard Specification for Grout for Masonry; 2020.
- K. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2020.
- K. ASTM C1019 - Standard Test Method for Sampling and Testing Grout for Masonry; 2020.
- L. ASTM C1314 - Standard Test Method for Compressive Strength of Masonry Prisms; 2022.
- M. ASTM C1714/C1714M – Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- N. ASTM E514/E514M – Standard Test Methods for Water Penetration and Leakage Through Masonry; 2020.
- O. ASTM E518/E518M – Standard Test Methods for Flexural Bond Strength of Masonry; 2021.
- P. TMS 402/602 – Building Code Requirements and Specification for Masonry Structures; 2016.

1.04 SUBMITTALS

- A. See Section 01 33 23 - for submittal procedures.
- B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.
- C. Samples: Submit two samples of mortar, illustrating mortar color and color range.
- D. Reports: Submit reports on mortar indicating compliance of mortar to property requirements of ASTM C270 and test and evaluation reports per ASTM C780.
- E. Reports: Submit reports on grout indicating compliance of component grout materials to requirements of ASTM C476 and test and evaluation reports to requirements of ASTM C1019.
- F. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- G. Manufacturer's Installation Instructions: Submit packaged dry mortar manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

- A. Comply with provisions of TMS 402/602, except where exceeded by document requirements.
 - 1. Maintain one copy of each document on project site.

1.06 PRECONSTRUCTION TESTING

- A. Testing will be conducted by an independent test agency, in accordance with provisions of 01 45 33 – Code Required Special Inspections.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.08 FIELD CONDITIONS

- A. Cold and Hot Weather Requirements: Comply with requirements of TMS 402/602 or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

- A. At Contractor's option, mortar and grout may be made from factory premixed dry materials with addition of water only or ready-mixed.
- B. Mortar Color: Natural gray unless otherwise indicated.
- C. Mortar Mix Designs: ASTM C270, Property Specification.
 - 1. Masonry below grade and in contact with earth: Type S.
 - 2. Exterior, Non-loadbearing Masonry: Type S.
 - 3. Interior, Loadbearing Masonry: Type S.
 - 4. Interior, Non-loadbearing Masonry: Type N.

D. Grout Mix Designs:

1. Bond Beams, Lintels, and walls: 3,125 psi strength at 28 days; 8-10 inches slump; mix in accordance with ASTM C94/C94M.
 - a. Fine grout for spaces with smallest horizontal dimension of 2 inches or less.
 - b. Coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

2.02 MATERIALS

- A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 1. Color: Standard gray.
- B. Packaged Dry Material for Mortar for Unit Masonry: Premixed masonry cement and mason's sand; complying with ASTM C1714/C1714M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
 1. Color: Standard gray.
- C. Portland Cement: ASTM C150/C150M.
 1. Type: Type I - Normal; ASTM C150/C150M.
 2. Color: Standard gray.
- D. Masonry Cement: ASTM C91/C91M.
 1. Type: Type N; ASTM C91/C91M.
 2. Color as stated above.
- E. Hydrated Lime: ASTM C207, Type S.
- F. Quicklime: ASTM C5, non-hydraulic type.
- G. Mortar Aggregate: ASTM C144.
- H. Grout Aggregate: ASTM C404.
- I. Water: Clean and potable.
- J. Accelerating Admixture: Non-chloride type for use in cold weather.

2.03 MORTAR MIXING

- A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.
- B. Maintain sand uniformly damp immediately before the mixing process.
- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of mortar.
- E. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

- A. Mix grout in accordance with ASTM C94/C94M.
- B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

- C. Add admixtures in accordance with manufacturer's instructions; mix uniformly.
- D. Do not use anti-freeze compounds to lower the freezing point of grout.

PART 3 EXECUTION

3.01 PREPARATION

- A. Plug clean-out holes for grouted masonry with block masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

- A. Install mortar and grout to requirements of section(s) in which masonry is specified.
- B. Work grout into masonry cores and cavities to eliminate voids.
- C. Do not install grout in lifts greater than 16 inches without consolidating grout by rodding.
- D. Do not displace reinforcement while placing grout.
- E. Remove excess mortar from grout spaces.

3.03 GROUTING

- A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.
- B. Low-Lift Grouting:
 - 1. Limit height of pours to 48 inches.
 - 2. Limit height of masonry to 48 inches above each pour.
 - 3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
 - 4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.
- C. High-Lift Grouting:
 - 1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
 - 2. Hollow Masonry: Limit lifts to maximum 4 feet and pours to maximum height of 24 feet.
 - 3. Place grout for spanning elements in single, continuous pour.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field tests, in accordance with provisions of Section 01 45 33 – Code Required Special Inspections.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY (Bid Package B only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. New ground face CMU for masonry patching (Bid Package B only).

1.2 RELATED WORK

- A. Section 04 10 00: Mortar and Masonry Grout.
- B. Section 04 22 01: Masonry Patching.
- C. Section 05 12 00: Structural steel items to be built in masonry work.
- D. Section 05 90 99: Metal fabrications to be built in masonry work.
- E. Section 07 92 00: Sealants for expansion/contraction joints.

1.3 QUALITY ASSURANCE

- A. Perform masonry work in accordance with requirements of ANSI A41.1 unless indicated otherwise herein.

1.4 REFERENCE STANDARDS

- A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
- B. ASTM A580/A580M - Standard Specification for Stainless Steel Wire; 2018.
- C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement; 2022.
- D. ASTM A641/A641M – Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire; 2019.
- E. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2015.
- F. ASTM A951/A951M - Standard Specification for Steel Wire for Masonry Joint Reinforcement; 2016, with Editorial Revision (2018).
- G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2018a.
- H. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2022.
- I. ASTM C91/C91M - Standard Specification for Masonry Cement; 2018.
- J. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2017.
- K. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
- L. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
- M. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.

- N. ASTM C216 - Standard Specification for Facing Brick (Solid Masonry Units Made From Clay or Shale); 2022.
- O. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
- P. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
- Q. ASTM C476 - Standard Specification for Grout for Masonry; 2020.
- R. ASTM C1714/C1714M - Standard Specification for Preblended Dry Mortar Mix for Unit Masonry; 2019a.
- S. ASTM D226/D226M – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing; 2017.
- T. ASTM E11 - Standard Specification for Woven Wire Test Sieve Cloth and Test Sieves; 2022.
- U. BIA Technical Notes No. 7 - Water Penetration Resistance – Design and Detailing; 2017.
- V. BIA Technical Notes No. 13 - Ceramic Glazed Brick Exterior Walls; 2017.
- W. BIA Technical Notes No. 28B - Brick Veneer/Steel Stud Walls; 2005.
- X. BIA Technical Notes No. 46 - Maintenance of Brick Masonry; 2017.
- Y. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.
- C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for face block support system.
 - 1. Control Joint Layout Plan: Provide a proposed control joint layout plan following the criteria listed in the structural drawings.
- D. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.
- E. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the type of products specified in this section with minimum five years of documented experience.
- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

- A. Ground face (smooth) CMU Units: ASTM C90.
 - 1. Products by Concrete Products of Sioux City, Iowa approved. Other manufacturer's by prior approval. See spec section 01 60 00.
 - 2. Weight Classification: Normal weight.
 - 3. Size: veneer units; 4"x8"x16" or "soaps" (as required by detailing).
 - 4. Color/Texture: match existing CMU.
 - 5. Location: Masonry patching at Bid Package B – Pedestrian Bridge Repairs.

2.02 MORTAR AND GROUT MATERIALS

- A. Masonry Cement: As specified in Section 04 10 00.

2.03 ANCHORAGE

- A. Tapcon anchors to back up masonry wall at repair areas or alternate method as discussed and approved with architect/structural engineer.

2.04 ACCESSORIES

- A. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials. Prosoco Sure-Klean or equivalent.

2.05 MORTAR AND GROUT MIXING

- A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
- B. Grout: ASTM C476; consistency required to fill completely volumes indicated for grouting; fine grout for spaces with smallest horizontal dimension of 2 inches or less; coarse grout for spaces with smallest horizontal dimension greater than 2 inches.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive masonry.
- B. Verify that related items provided under other sections are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied for installation under other sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.
- C. Remove damaged or surrounding materials as needed to properly complete repairs. Prepare remaining opening to receive new CMU patch.

3.03 COLD AND HOT WEATHER REQUIREMENTS

- A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.
- B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

- A. Establish lines, levels, and coursing indicated. Protect from displacement.
- B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.
- C. Concrete Masonry Units:
 - 1. Bond: Match existing.
 - 2. Coursing: One unit and one mortar joint to equal 8 inches.
 - 3. Mortar Joints: Concave.

3.05 PLACING AND BONDING

- A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.
- B. Lay masonry units with face shells fully bedded in mortar and with head joints of depth equal to bed joints.
- C. Lay with webs fully bedded in mortar in all courses of piers, columns, and pilasters.
- D. Lay with webs fully bedded in mortar in grouted masonry, including starting course on footings.
- E. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.
- F. Remove excess mortar and mortar smears as work progresses.
- G. Remove excess mortar with water repellent admixture promptly. Do not use acids, sandblasting or high pressure cleaning methods.
- H. Do not shift or tap masonry units after mortar has achieved initial set. Where adjustment must be made, remove mortar and replace.
- I. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.
- J. Cut mortar joints flush where wall tile is scheduled or resilient base is scheduled.
- K. Isolate masonry partitions from vertical structural framing members with a control joint as indicated.
- L. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.
- M. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work and until walls are topped out. Cover partially completed masonry when construction is not in progress. Cover topped out walls when roof installation is not expected for a prolonged period of time.
 - 1. Extend cover a minimum of 24 inches or more down both sides of walls and hold cover security in place. Cover is to protect structure bearing pocket locations,

extend beyond 24 inches if needed. Means of attaching coverings is at contractor's option but must be sufficient so coverings protect against the elements and are not shredded or blown away.

2. Where one wythe of multi-wythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches down face next to unconstructed wythe and hold cover in place.

3.08 ANCHORAGES

- A. Place anchors at spacing and locations to best provide a solid patch assembly.

3.09 CLEANING

- A. Remove excess mortar and mortar droppings.
- B. Replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces with cleaning solution.
- D. Use non-metallic tools in cleaning operations.

3.10 PROTECTION

- A. Contractor shall use appropriate measures to properly protect exposed masonry cavities from excess moisture during construction. See 3.05 above.

END OF SECTION

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SECTION 04 22 01

**MASONRY PATCHING
(Bid Package B only)**

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. CMU masonry wall repairs around bridge structure connection to building.
- B. Work required under Bid Package B – Pedestrian Bridge Repair.

1.2 RELATED WORK

- A. Section 04 10 00: Mortar.
- B. Section 04 22 00: Unit Masonry.
- C. Section 07 92 00: Sealants for joints.

1.3 QUALITY ASSURANCE

- A. Perform masonry work in accordance with requirements of ANSI A41.1 unless indicated otherwise herein.

1.4 REFERENCE STANDARDS

- A. ANSI A41.1 - Building Code Requirements for Masonry.

1.5 SUBMITTALS

- A. None required.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Do not lay masonry when temperature is below 40 degrees F. or expected to fall below 40 degrees F. unless masonry materials are heated to at least 40 degrees F. and the completed work is protected from freezing. Maintain an air temperature above 50 degrees F. on both sides of the masonry for at least 48 hours after the masonry work is completed.
- B. During freezing or near freezing weather, provide adequate equipment or cover to maintain a minimum temperature of 50 degrees F. and to protect masonry work completed or in progress. Conform to all other requirements stated in Division 1.

1.7 CONSTRUCTION REQUIREMENTS

AIR TEMP.
(Degrees F.)

- A. 40 - 42 Heat mixing water or sand to product mortar temperature between 40 degrees F. and 120 degrees F.

- B. 32 - 35 Heat mixing water and sand to produce mortar temperature between 40 degrees F. and 120 degrees F. Maintain temperature of mortar on boards above freezing.
- C. 25 - 15 Heat mixing water and sand to product mortar temperature between 40 degrees F. and 120 degrees F. Maintain temperature of mortar on boards above freezing. Heat masonry units so their temperature, when laid, is not less than 20 degrees F. Utilize sources of heat on both sides of wall under construction. Employ windbreaks when wind is in excess of 15 mph.
- D. 15 and below Heat mixing water and sand to produce mortar temperature between 40 degrees F. and 120 degrees F. Heat masonry units so their temperature is not less than 20 degrees F. Provide enclosure and auxiliary heat to maintain air temperature above 32 degrees F.

PART 2 - PRODUCTS

2.1 MASONRY REPAIRS

- A. Provide new ground face CMU masonry (matching existing masonry color and finish) to patch around bridge repair connection to building (see spec section 04 22 00). Replace all damaged units. Clean all existing mortar/caulk from opening being filled. Tuckpoint areas where mortar is failing, cracked or separated from surrounding masonry. Caulk joint between new bridge construction and masonry for weathertightness.
 - a. Any undamaged units may be salvaged and reused. Clean existing units of remaining mortar after salvage and reinstall as indicated on plans.
- B. Mortar joint profile and color shall match existing wall conditions.

2.3 REINFORCEMENT AND ANCHORAGES

- A. Anchor brick at patched areas by means of tapcon anchors at back of units into existing back-up wall construction or as necessary for existing conditions.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Establish lines, levels, and coursing. Protect from disturbances.

3.2 MASONRY REPAIRS

- A. Masonry contractor shall remove existing masonry that is damaged and replace with new units to match surrounding wall surface if necessary.

3.3 CUTTING AND FITTING

- A. Cut and fit masonry as needed. Cooperate fully with other sections of work to ensure correct size, shape, and location.
- B. Obtain Architect/Engineer's review prior to cutting or fitting any area that is not indicated on drawings, or that may impair appearance/strength of masonry work.

3.4 CLEANING

- A. Remove excess mortar and smears upon completion of masonry work.
- B. Point or replace defective mortar. Match adjacent work.
- C. Clean soiled surfaces using a Sure-Klean product as recommended by manufacturer and masonry manufacturer. Use nonmetallic tools in cleaning operation.
- D. Do not use muriatic acid or abrasive powders.

END OF SECTION

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SECTION 05 12 00

STRUCTURAL STEEL FRAMING (Bid Package B only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Structural steel framing members.
- B. Structural steel components and accessories.
- C. Grouting.
- D. Work included under the following Bid Packages:
 - 1. Bid Package B – Pedestrian Bridge Repair

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00 – Cast-in-Place Concrete.
- B. Section 03 41 00 – Precast Structural Concrete.
- C. Section 05 90 99 – Miscellaneous Metals: Steel fabrications affecting structural steel work at pedestrian bridge.

1.03 REFERENCE STANDARDS

- A. AISC (MAN) - Steel Construction Manual 2017.
- B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2016.
- C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.
- E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- F. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2021.
- G. ASTM A514/A514M - Standard Specification for High-Yield-Strength, Quenched and Tempered Alloy Steel Plate, Suitable for Welding 2022.
- H. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality 2019.
- I. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel 2021, with Editorial Revision.
- J. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2022.
- K. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film 2017.
- L. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments 2019.

- M. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry 2018.
- N. ASTM E709 - Standard Guide for Magnetic Particle Testing 2021.
- O. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.
- P. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2022).
- Q. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2020.
- R. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer 2004.

1.04 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Shop Drawings:
 1. Indicate profiles, sizes, spacing, and locations of structural members.
 2. Connections not detailed.
 3. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

- A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

PART 2 PRODUCTS

2.01 MATERIALS

- A. Steel Angles and Plates: ASTM A36/A36M.
- B. Steel W Shapes and Tees: ASTM A992/A992M.
- C. Rolled Steel Structural Shapes: ASTM A992/A992M.
- D. Steel Shapes, Plates, and Bars: ASTM A529/A529M high-strength, carbon-manganese structural steel, Grade 50.
- E. Steel Plates and Bars: ASTM A572/A572M, Grade 50 (345) high-strength, columbium-vanadium steel.
- F. Steel Plate: ASTM A514/A514M.
- G. Structural Bolts and Nuts: Carbon steel, ASTM A307, Grade A and galvanized in compliance with ASTM A153/A153M Class C.
- H. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563 or ASTM A563M nuts and ASTM F436/F436M washers.
- I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

- J. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch.
 - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch.
- K. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.
- L. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

- A. Shop fabricate to greatest extent possible.
- B. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

2.03 FINISH

- A. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.
- B. Prepare all new and existing structural component surfaces in accordance with SSPC-SP 3 (pedestrian bridge)
- C. Galvanize structural steel members to comply with ASTM A123/A123M. Provide minimum 1.7 oz/sq ft galvanized coating.
- D. Paint all steel surfaces as indicated in Section 09 91 23.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

- A. Erect structural steel in compliance with AISC 303.
- B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.
- C. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- D. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for non-shrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

3.04 FIELD QUALITY CONTROL

- A. An independent testing agency will perform field quality control tests, as specified in Section 01 45 33 – Code-Required Special Inspections.
- B. High-Strength Bolts: Provide testing and verification of field-bolted connections in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts," testing at least 25% percent of bolts at each connection.
- C. Welded Connections: Visually inspect all field-welded connections and test at least 10 percent of welds using one of the following:
 - 1. Radiographic testing performed in accordance with ASTM E94/E94M.
 - 2. Ultrasonic testing performed in accordance with ASTM E164.
 - 3. Liquid penetrant inspection performed in accordance with ASTM E165/E165M.
 - 4. Magnetic particle inspection performed in accordance with ASTM E709.

END OF SECTION

SECTION 05 90 98

**MISCELLANEOUS METALS
(Bid Package A only)**

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Custom fabricated and stock manufactured items.
- B. Installation of miscellaneous items.
- C. Refer to schedule located at end of this Section.

1.2 RELATED WORK

- A. Section 03 30 00: Cast-in-Place Concrete
- B. Section 13 34 29: Fabricated Pre-Engineered Metal Building Systems

1.3 WORK FURNISHED, BUT NOT INSTALLED

- A. Section 03 30 00: Metal Fabrications Cast in Concrete

1.4 REFERENCE STANDARDS

- A. ASTM A36 - Structural Steel.
- B. ASTM A307 - Low Carbon Steel Externally and Internally Threaded Fasteners.
- C. ASTM A325 - High Strength Bolts for Structural Steel Joints, Including Suitable Nuts and Plain Hardened Washers.
- D. AWS D1.1 - Structural Welding Code.
- E. FS TT-P-86 - Paint, Red-Lead Base, Ready Mixed.

1.5 SHOP DRAWINGS

- A. Submit Shop drawings of metal fabrications and stock manufactured items in accordance with Section 01 33 23.
- B. Indicate profiles, sizes, connection attachments, reinforcing, anchorages, size and type of fasteners, and accessories.
- C. Include erection drawings, elevations, and details where applicable.
- D. Indicate welded connections, using standard AWS welding symbols. Indicate net weld lengths.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Provide and install items as listed in schedule at end of this Section, complete in respect to function as intended.

2.2 MATERIALS

- A. Steel: ASTM A36.
- B. Bolts, Nuts, and Washers: ASTM A307.
- C. Welding Materials: Applicable AWS D1.1, type required for materials being welded.
- D. Primer: Red lead, FS TT-P-86, Type I. 10-99 primer as manufactured by Tnemec Company, Inc. approved.

2.3 FABRICATION

- A. Verify dimensions on site prior to shop fabrications.
- B. Fabricate items with joints neatly fitted and properly secured.
- C. Fit and shop assemble in largest practical sections for delivery to site.
- D. Grind exposed welds smooth and flush with adjacent finished surfaces.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts unobtrusively located consistent with design of structure, except where specifically noted otherwise.
- F. Make exposed joints flush, butt type, hair line joints where mechanically fastened.
- G. Supply components required for proper anchorage of metal fabrications. Fabricate anchorage and related components of same material and finish as metal fabrication, unless otherwise specified in Schedule herein.
- H. Thoroughly clean surfaces of rust, scale, grease, and foreign matter prior to prime painting or galvanizing.
- I. Galvanize and prime paint items as scheduled. Do not shop prime surfaces in contact with concrete or requiring field welding. Shop prime in one (1) coat. Provide minimum 1.25 oz./sq. ft. galvanized coating.

PART 3 - EXECUTION

3.1 ERECTION

- A. Obtain Architect/Engineer's review prior to site cutting or making adjustments that are not part of scheduled work.
- B. Install items square and level, accurately fitted and free from distortion or defects.
- C. Make provisions for erection stresses by temporary bracing. Keep work in alignment.
- D. Replace items damaged in course of installation.
- E. Perform field welding in accordance with AWS D1.1.

- F. After installation, touch up field welds and scratched and damaged prime painted and galvanized surfaces. Use a primer consistent with shop coat. Use a primer recommended for galvanized surfaces.
- G. Supply to appropriate sections items requiring to be cast into concrete or embedded in masonry, complete with necessary setting templates.

3.2 SCHEDULE OF ITEMS

- A. Supply and install metal fabrications listed herein, complete with anchorage and attachments necessary for installation.
- B. Schedule of miscellaneous metal items:
 - 1. Miscellaneous Plates, Bolts and Anchors:
 - a. Furnish miscellaneous plates, bolts and anchors indicated on the Drawings and not specified under other sections of this Specification. Fabricate according to details. Furnish nuts and washers for all bolts.
 - 2. Miscellaneous Angles:
 - a. Provide miscellaneous steel angles indicated on the Drawings and not specified under other sections of this Specification. Fabricate according to details. Pre-drill holes when required.
 - 3. Embed angles with studs at garage door sills.
 - 4. Steel bollards.
 - 5. Other items as shown on drawings.

END OF SECTION

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SECTION 05 90 99

MISCELLANEOUS METAL (Bid Package B only)

PART 1 - GENERAL

3.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

3.2 SUMMARY

- A. Section Includes:
 - 1. Exterior metal guardrails under Bid Package B – Pedestrian Bridge Repair.
 - 2. See drawings for other miscellaneous metals requirements.
- B. Related Requirements:
 - 1. Section 03 30 00: Concrete
 - 2. Section 03 41 00: Precast Structural Concrete
 - 3. Section 05 21 00: Structural Steel
 - 4. Section 09 91 23: Painting and Coatings

3.3 COORDINATION

- A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.
- B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

3.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1. Paint products.
 - 2. Grout.

- B. Shop Drawings: Show fabrication and installation details. Provide Shop Drawings for the following:
 - 1. All items specified under this section.

3.5 INFORMATIONAL SUBMITTALS

- A. Retain "Welding certificates" Paragraph below if retaining "Welding Qualifications" Paragraph in "Quality Assurance" Article.
- B. Welding certificates.
- C. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers, certifying that shop primers are compatible with topcoats.

3.6 QUALITY ASSURANCE

- A. Retain one of two "Welding Qualifications" paragraphs below if shop or field welding is required. If retaining, also retain "Welding certificates" Paragraph in "Informational Submittals" Article.
- B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 - 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 - 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 - 3. AWS D1.6/D1.6M, "Structural Welding Code - Stainless Steel."

3.7 FIELD CONDITIONS

- A. If possible, design metal fabrications so that they do not have to fit other construction and delete this article.
- B. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing

buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

2.2 METALS

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.
- B. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- C. Stainless-Steel Sheet, Strip, and Plate: ASTM A 240/A 240M or ASTM A 666, Type 304.
- D. Stainless-Steel Bars and Shapes: ASTM A 276, Type 304.
- E. Steel Tubing: ASTM A 500/A 500M, cold-formed steel tubing.
- F. Steel Pipe: ASTM A 53/A 53M, Standard Weight (Schedule 40) unless otherwise indicated.
- G. Shop Primers: Provide primers that comply with Section 09 91 23 "Painting & Coatings."
- H. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
 1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.
- I. Non-shrink, Nonmetallic Grout: Factory-packaged, non-staining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

2.3 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

- C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- D. Form exposed work with accurate angles and surfaces and straight edges.
- E. Weld corners and seams continuously to comply with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.
- G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.
- I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.
- J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1-1/2 inches, with a minimum 6-inch embedment and 2-inch hook, not less than 8 inches from ends and corners of units and 24 inches o.c., unless otherwise indicated.

2.4 MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.
- B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.
 - 1. Fabricate units from slotted channel framing where indicated.
 - 2. Furnish inserts for units installed after concrete is placed.
- C. Fabricate supports for operable partitions from continuous steel beams of sizes recommended by partition manufacturer with attached bearing plates, anchors,

and braces as recommended by partition manufacturer. Drill or punch bottom flanges of beams to receive partition track hanger rods; locate holes where indicated on operable partition Shop Drawings.

- D. Galvanize miscellaneous framing and supports where indicated.
- E. Prime miscellaneous framing and supports with primer specified in Section 09 91 23 "Painting & Coatings" where indicated.

2.5 FINISHES, GENERAL

- A. Finish metal fabrications after assembly.
- B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.6 STEEL AND IRON 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.
 - 1. Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
- B. Shop prime iron and steel items not indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.
 - 1. Shop prime with universal shop primer unless primers specified in Section 09 91 23 "Painting & Coatings" are indicated.
- C. Preparation for Shop Priming: Prepare surfaces to comply with requirements indicated below:
 - 1. Exterior Items: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2. Items Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 3. Items Indicated to Receive Primers Specified in Section 09 91 23 "Painting & Coatings": SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 4. Other Items: SSPC-SP 3, "Power Tool Cleaning."
- D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.
 - 1. Stripe paint corners, crevices, bolts, welds, and sharp edges.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.
- C. Field Welding: Comply with the following requirements:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.
 - 3. Remove welding flux immediately.
 - 4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
- D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.
- E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.
- F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:
 - 1. Cast Aluminum: Heavy coat of bituminous paint.

3.2 INSTALLING MISCELLANEOUS FRAMING AND SUPPORTS

- A. General: Install framing and supports to comply with requirements of items being supported, including manufacturers' written instructions and requirements indicated on Shop Drawings.

3.3 ADJUSTING AND CLEANING

- A. Retain first "Touchup Painting" Paragraph below if touchup painting is included in this Section. Retain second paragraph if it is specified in Section 09 9113 "Exterior Painting" or Section 09 9123 "Interior Painting." Revise reference if Section 09 9600 "High Performance Coatings" is used.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 23 "Painting & Coatings."

3.4 SCHEDULE

- A. Exterior Guardrails: Provide exterior guardrails with the profile and design shown on drawings. See sheet B-A1.1.
- B. Miscellaneous embeds. See Sheet B-S1.1.
- C. Miscellaneous angles, plates, anchors, etc. See Sheet B-S1.1.
- D. See drawings for other requirements.

END OF SECTION

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SECTION 06 10 00

ROUGH CARPENTRY (Bid Package A only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Included under Bid Package A – Bus Barn:
 - 1. Wood framing and blocking.
 - 2. Miscellaneous blocking and plywood.

1.2 RELATED WORK

- A. Section 07 21 16: Thermal Insulation
- B. Section 09 21 16: Gypsum Wallboard Systems
- C. Section 13 34 19: Fabricated Pre-Engineered Metal Building Systems

1.3 QUALITY ASSURANCE

- A. Lumber to have visible grade stamp of any agency certified by NFPA.

1.4 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard 2022.
- B. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.
- C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2022.
- D. AWWA U1 - Use Category System: User Specification for Treated Wood 2022.
- E. PS 1 – Structural Plywood 2009 (Revised 2019).
- F. PS 2 – Performance Standard for Wood Structural Panels 2018.
- G. PS 20 – American Softwood Lumber Standard 2021.
- H. NFPA National Forest Products Association National Design Specification for Stress Grade Lumber and Its Fastening.

PART 2 - PRODUCTS

2.1 LUMBER AND SHEET MATERIALS

- A. Lumber: PS-20, and graded in accordance with NFPA Grading Rules; maximum moisture content of 19%.
 - 1. Species: Spruce-Pine-Fir, Douglas Fir South, and Douglas Fir-Larch.
 - 2. Grade: No. 2.
 - 3. Pressure treated lumber used where noted.
- B. Plywood: PSI, and graded in accordance with APA Grading Rules: thickness as noted on drawings.
 - 1. Interior plywood: APA A-D INT with exterior Glue.

- C. Pressure-treated lumber shall be used for wood curbs, blocking and nailers located around the roof and places in contact with masonry or concrete or exposed to the elements.

2.2 ACCESSORY MATERIALS

- A. Nails, Spikes, and Staples: Hot-dipped galvanized stainless steel or aluminum for exterior locations, high humidity locations, and Redwood; plain finish for other interior locations; size and type to suit application.
- B. Bolts, Nuts, Washers, Lags, Pins, and Screws: Medium carbon steel; sized to suit application; galvanized for exterior locations, high humidity locations, and Redwood; plain finish for other interior locations.
- C. Fasteners: Toggle bolt type for anchorage to hollow masonry and expansion shield and lag bolt type for anchorage to solid masonry or concrete.

PART 3 - EXECUTION

3.1 PLACEMENT

- A. Place miscellaneous blocking, furring, nailing strips, and framing true to lines and levels. Secure rigidly in place.
- B. Construct members of continuous pieces of longest possible lengths.

3.2 FRAMING

- A. Workmanship shall be first class in every way and shall be performed by skilled mechanics in accordance with the best practices and standards of the trade.
- B. Construct wood framing, miscellaneous blocking, furring, and nailing strips true to lines and levels. Secure rigidly in place. Do not deviate from true alignment more than 1/4"; do not shim bearing surfaces.
- C. Construct members of continuous pieces of longest possible lengths.
- D. Provide and install all rough hardware and metal fastenings as shown on Drawings and required for proper installation of carpentry. Nails, spikes, screws, bolts, and similar items shall be of size and types to rigidly secure members in place.
- E. Unless shown otherwise, use single sole plates and double top plates.
- F. Temporary centering, bracing and shoring for the support and protection of the structure during construction shall be made adequately strong, properly installed and well secured in place to serve the intended purpose.

END OF SECTION

SECTION 06 83 16

FIBERGLASS REINFORCED PANELING (Bid Package A only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Fiberglass reinforced plastic panels (FRP).
- B. Trim.

1.2 RELATED WORK

- A. Section 09 21 16: "Gypsum Wallboard Systems" for FRP substrate in Wash Bay 104.

1.3 REFERENCE STANDARDS

- A. ASTM D3273 – Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.
- B. ASTM D5319 – Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2017.
- C. ISO 2812-1 – Paints and Varnishes – Determination of Resistance to Liquids – Part 1: Immersion in Liquids Other than Water; 2017.

1.4 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Fiberglass Reinforced Plastic Panels:
 - 1. Basis of Design: Crane Composites, Inc; Varietex: www.cranecomposites.com/#sle.
 - 2. Marlite, Inc; Standard FRP: www.marlite.com/#sle.
 - 3. Nudo Products, Inc; Nufiber: www.nudo.com/#sle.
 - 4. Or approved equal.

2.2 CEILING AND WALL PANEL SYSTEMS

- A. Panel Size and Thickness: 4 by 8 feet; 0.09 inch thick.
- B. Surface Design: Embossed.
- C. Color: White.
- D. Attachment method: Adhesive only, with trim and sealant in joints onto glass mat faced substrate.
- E. Support for glass mat faced board substrate: metal framing, see drawings.

2.3 MATERIALS

- A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
 - 1. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - 2. Chemical Cleanability: Excellent chemical resistance to common cleaners and detergents when tested in accordance with ISO 2812-1.
- B. Trim: Vinyl; color coordinating with panel.
- C. Adhesive: Type recommended by panel manufacturer.
- D. Sealant: Type recommended by panel manufacturer for moist environments.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions and substrate for flatness before starting work.
- B. Verify that substrate conditions are ready to receive the work of this section.

3.2 INSTALLATION – WALLS AND CEILINGS

- A. Install panels in accordance with manufacturer's instructions.
- B. Cut with carbide tipped saw blades or snips.
- C. Lay out panels to a balanced grid design, with edge units greater than 50 percent of panel size.
- D. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.
- F. Apply panels with seams true and pattern aligned to adjoining panels.
- G. Install panels with manufacturer's recommended gap for panel field and corner joints.
- H. Place trim on panel before fastening edges, as required.
- I. Fill channels in trim with sealant before attaching to panel.
- J. Install trim with adhesive and screws or nails, as required.
- K. Seal gaps at wall trim, and between panels with applicable sealant to prevent moisture intrusion.
- L. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 21 16

THERMAL INSULATION (Bid Package A only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Rigid board insulation at perimeter foundation wall.
- B. Batt insulation in interior framed fire barrier wall.

1.02 RELATED REQUIREMENTS

- A. Section 04 20 00 - Unit Masonry.
- B. Section 06 10 00 - Rough Carpentry
- C. Section 07 25 00 - Weather Barriers: Separate air barrier and vapor retarder materials.

1.03 REFERENCE STANDARDS

- A. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
- B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.
- C. ASTM C764 – Standard Specification for Mineral Fiber Loose-Fill Thermal Insulation; 2019.
- D. ASTM C1015 – Standard Practice for Installation of Cellulosic and Mineral Fiber Loose-Fill Thermal Insulation; 2017.
- E. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022.
- F. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2022.
- G. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022.
- H. ASTM E136 – Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750°C; 2019a.
- I. ASTM E2357 - Standard Test Method for Determining Air Leakage of Air Barrier Assemblies; 2018.
- J. FM DS 1-28 - Wind Design; 2020.

1.04 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.
- C. Manufacturer's Certificate: Products meet/exceed specified requirements.

1.05 FIELD CONDITIONS

- A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 FOAM BOARD INSULATION MATERIALS

- A. Rigid Foundation Insulation: Styrofoam SM Brand Insulation as manufactured by Dow Chemical Company. Size shall be 2" thickness. Extend from floor elevation down to footing or as shown. Equivalent products as manufactured by Owens Corning (Foamular 250), U.S.G., Foam Control Plus+ EPS Type II by ACH Foam Technologies and Minnesota Diversified Products approved.

2.02 BATT INSULATION MATERIALS

- A. Glass Fiber Batt Insulation: Flexible preformed batt or blanket, complying with ASTM C665; friction fit.
 1. Flame Spread Index: 75 or less, when tested in accordance with ASTM E84.
 2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
 3. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
 4. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com/#sle.
 - b. Johns Manville: www.jm.com/#sle.
 - c. Owens Corning Corporation: www.ocbuildingspec.com/#sle.
 - d. Or approved equal.

2.03 ACCESSORIES

- A. Tape: Polyethylene self-adhering type, mesh reinforced, 2 inch wide.
- B. Fasteners, adhesives: As recommended by manufacturers of insulation.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.
- B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.
- C. Verify that light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.
- D. Verify spaces are unobstructed to allow proper placement of insulation.

3.02 BOARD INSTALLATION AT FOUNDATION CAVITY WALL

- A. Install boards vertically on foundation perimeter.

1. Vertical on foundation wall: Install from underside of concrete floor slab to 2' below adjacent grade or to footings as indicated. At locations without a footing, install full depth of foundation/footing but not more than 4'-0".
 2. Butt edges and ends tightly to adjacent boards and to protrusions.
- B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BATT INSTALLATION

- A. Install insulation in accordance with manufacturer's instructions.
- B. Install in interior framed wall as indicated. Do not compress insulation.
- C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.
- D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.
- E. Tape insulation batts in place.

3.04 PROTECTION

- A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 84 00

(BID PACKAGE A ONLY)

FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

- A. Section 092116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

- A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials 2022.
- B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems 2023a.
- C. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems 2015 (Reapproved 2019).
- D. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies 2023.
- E. ITS (DIR) - Directory of Listed Products Current Edition.
- F. FM (AG) - FM Approval Guide Current Edition.
- G. UL 1479 - Standard for Fire Tests of Penetration Firestops Current Edition, Including All Revisions.
- H. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations.

1.05 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Firestopping Manufacturers:
 - 1. 3M Fire Protection Products; www.3m.com/firestop.
 - 2. CEMCO; HOTROD Type-X Compressible Firestopping: www.cemcosteel.com.
 - 3. Hilti, Inc; www.hilti.com.
 - 4. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com.

2.02 MATERIALS

- A. Firestopping Materials: Any materials meeting requirements.
- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.
- C. Fire Ratings: Refer to drawings for required systems and ratings.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
 - 1. Movement: Provide systems that have been tested to show movement capability as indicated.
- B. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.04 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
 - 1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.
- B. Firestopping at Uninsulated Metallic Pipe and Conduit Penetrations, of diameter 4 inches (100 mm) or less: Caulk or putty.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.
- C. Install backing materials to prevent liquid material from leakage.

3.03 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

3.04 CLEANING

- A. Clean adjacent surfaces of firestopping materials.

3.05 PROTECTION

- A. Protect adjacent surfaces from damage by material installation.

END OF SECTION

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SECTION 07 92 00

JOINT SEALANTS (Bid Packages A and B)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Various conditions across all bid packages, refer to Drawings for each.
- B. Clean and prepare surfaces to receive sealant materials.
- C. Install sealant and backing materials specified herein or indicated on Drawings and not specifically mentioned in other sections of this Specifications.
- D. See Civil specifications for other exterior paving sealant materials and installation.

1.2 RELATED WORK

- A. Section 01 23 00: Alternates
- B. Section 03 30 00: Cast-In-Place Concrete
- C. Section 07 46 00: Fiber Cement Siding
- D. Section 07 60 00: Sheet Metal.
- E. Section 08 11 13: Hollow Metal Doors and Frames.
- F. Section 08 41 13: Aluminum Storefront System.
- G. Section 08 43 13: Aluminum Framed Entrances.
- H. Section 08 51 13: Aluminum Windows
- I. Section 09 21 16: Gypsum Board Assemblies.

1.3 PRODUCT DATA

- A. Submit Product Data in accordance with Section 01 33 32.
- B. Submit manufacturers' descriptive literature, including surface preparation and installation instructions.

PART 2 - PRODUCTS

2.1 SEALANT MATERIALS

- A. One-Part Elastomeric Sealant: Sonolastic 150 as manufactured by Sonneborn; Dymeric as manufactured by Tremco, approved.
- B. Latex Base Sealant: Sonolac as manufactured by Sonneborn.
- C. Urethane Joint Sealant: Sonolastic Paving Joint Sealant as manufactured by Sonneborn; Dymeric as manufactured by Tremco, approved.
- D. Silicone Base Sealants: G.E. Silicone Sanitary Sealant or Dow Corning Silicone Rubber Bathtub Caulk.
- E. Color of sealants as selected by Architect/Engineer.
- F. Equivalent products by Pecora and Tremco approved.

2.2 PREPARATORY MATERIALS

- A. Primer(s): Non-staining type(s) recommended by sealant manufacturer to suit application(s).
- B. Joint Cleaner(s): Non-corrosive type(s) recommended by sealant manufacturer; compatible with joint forming materials.
- C. Joint Filler: Round closed cell polyethylene foam rod; oversized.
- D. Bond Breaker(s): Pressure sensitive type(s) recommended by sealant manufacturer to suit application(s).

PART 3 - EXECUTION

3.1 PREPARATION / INSTALLATION

- A. Maintain workmanship of the highest quality in accordance with best trade practice.
- B. Clean and prepare joints in accordance with manufacturer's recommendations. Remove any loose materials and other foreign matter which might impair adhesion of sealant.
- C. Ensure that joint forming materials are compatible with sealant.
- D. Examine joint dimensions and size materials to achieve required width/depth ratios. Use joint filler to achieve required joint depths to allow sealants to perform properly. Use bond breaker(s) where required.
- E. Install sealant in accordance with manufacturer's recommendations.
- F. Install the various types of sealants in the following locations:
 - 1. One-Part Elastomeric (Sonolastic 150):
 - a. Exterior of exterior door frames, windows, and louvers.
 - b. Metal thresholds.
 - c. Mechanical openings.
 - d. Exterior joints at masonry. Other exterior joints as detailed.
 - 2. Latex Base (Sonolac):
 - a. Interior of exterior door frames.
 - b. Other interior wall and ceiling joints.
 - 3. Joint Sealant (Sonolastic Paving Joint Sealant):
 - a. Exterior joints in landings and concrete work immediately adjacent to the building.
 - b. See civil specifications for all other paving sealant requirements.
 - 4. Silicone Base (G.E. Sanitary or Dow Bathtub):
 - a. Around all wall hung plumbing fixtures.
 - b. Around janitor and service sinks.
 - c. Countertop joints and backsplashes.
 - 5. All other products as recommended by system manufacturer.
- G. Clean joints as recommended by sealant manufacturer.
- H. Apply sealant within recommended temperature ranges and if cannot be applied within the recommended temperature range consult manufacturer.
- I. Prime surfaces to be caulked with sealant according to manufacturer's recommendations. Care to be taken to prevent excess primer from being applied outside of joints.
- J. Provide bond breaker as required by sealant manufacturers.

- K. Apply sealants according to manufacturer's instructions.
 - 1. Applied with material gun using a nozzle of sufficient size to fill the joint completely. Tool joints immediately after application of material. Finish bead flush with adjoining surfaces, unless otherwise indicated.
- L. Mask joint, as required; remove masking, excess materials, and smears, as the work progresses, and leave adjacent surfaces clean and free of sealant.

END OF SECTION

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SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES (Bid Package A only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Fire-rated and Non-fire-rated hollow metal doors and frames.
- B. Thermally insulated hollow metal doors with frames.
- C. Doors and Frames required under the following Package:
 - 1. Package A – Bus Barn

1.02 RELATED REQUIREMENTS

- A. Section 07 92 00 – Joint Sealant.
- B. Section 08 70 00 - Door Hardware.
- C. Section 09 91 23 – Painting and Coatings.

1.03 ABBREVIATIONS AND ACRONYMS

- A. ANSI: American National Standards Institute.
- B. HMMA: Hollow Metal Manufacturers Association.
- C. NFPA: National Fire Protection Association.
- D. SDI: Steel Door Institute.
- E. UL: Underwriters Laboratories.

1.04 REFERENCE STANDARDS

- A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
- B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2011.
- C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames; 2003 (R2009).
- D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.
- E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2011.
- F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2017.
- G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Solution Hardened, and Bake Hardenable; 2018.

- H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2016.
- J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014.
- K. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames; 2016.
- L. FEMA P-361 - Safe Rooms for Tornadoes and Hurricanes: Guidance for Community and Residential Safe Rooms; 2015.
- M. ICC 500 - ICC/NSSA Standard for the Design and Construction of Storm Shelters; National Storm Shelter Association; 2014.
- N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
- O. ITS (DIR) - Directory of Listed Products; current edition.
- P. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; 2007.
- Q. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; 2014.
- R. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2019.
- S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2017.
- T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames; 2013.
- U. UL (DIR) - Online Certifications Directory; Current Edition.
- V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.05 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.
- D. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.
- E. Manufacturer's Qualification Statement.
- F. Installer's Qualification Statement.

1.06 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than five years documented experience.

- B. Installer Qualifications: Company specializing in performing work of the type specified and with at least five years of documented experience.
- C. Maintain at project site copies of reference standards relating to installation of products specified.

1.07 DELIVERY, STORAGE, AND HANDLING

- A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion and adverse effects on factory applied painted finish.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Hollow Metal Doors and Frames:
 - 1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
 - 3. Mesker, dormakaba Group: www.meskeropeningsgroup.com/#sle.
 - 4. Republic Doors, an Allegion brand: www.republicdoor.com/#sle.
 - 5. Steelcraft, an Allegion brand: www.allegion.com/#sle.
 - 6. West Central Manufacturing.
 - 7. Or approved equal.

2.02 PERFORMANCE REQUIREMENTS

- A. Requirements for Hollow Metal Doors and Frames:
 - 1. Steel Sheet: Comply with one or more of the following requirements; galvanized steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
 - 2. Accessibility: Comply with ICC A117.1 and ADA Standards.
 - 3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
 - 4. Door Edge Profile: Hinged edge square, and lock edge beveled.
 - 5. Typical Door Face Sheets: Flush.
 - 6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Flush.
 - 7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
 - 8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvanized) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.

- a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

- A. Door Finish: Factory primed and field finished.
- B. Type GHM, Exterior Doors: Thermally insulated.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 3 - Extra Heavy-duty.
 - b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 16 gage, 0.053 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
 - 2. Door Core Material: Polyisocyanurate, 2 lbs/cu ft minimum density. Polyurethane is an acceptable alternate.
 - a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.
 - 3. Door Thickness: 1-3/4 inch, nominal.
 - 4. Weatherstripping: Refer to Section 08 70 00.
 - 5. Provide weep-hole openings in bottom of exterior doors to permit moisture to escape. Seal joints in top edges of doors against water penetration.
- C. Type GHM, Interior Doors: Non-Fire-Rated.
 - 1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
 - a. Level 2 - Heavy-duty.
 - b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
 - c. Model 2 - Seamless.
 - d. Door Face Metal Thickness: 18 gage, 0.042 inch, minimum.
 - e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
 - 2. Door Thickness: 1-3/4 inch, nominal.

2.04 HOLLOW METAL FRAMES

- A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.
- B. Frame Finish: Same as hollow metal door unless noted otherwise in the door schedule.

- C. Full profile/continuously welded type: Full profile welded joints continuous; grind, fill, dress and make smooth, flush and invisible.
- D. Exterior Door Frames: Full profile/continuously welded type.
 - 1. Frame Metal Thickness: 14 gage, 0.067 inch, minimum.
 - 2. Weatherstripping: Separate, see Section 08 70 00.
 - 3. See below for requirements for grouting the frames.
- E. Interior Door Frames: Full profile/continuously welded type.
 - 1. Frame Metal Thickness: 16 gage, 0.053 inch, minimum.
 - 2. See below for requirements of insulating frames for sound deadening.
- F. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
- G. Jamb Anchors: Provide number and spacing of anchors as follows:
 - 1. Locate anchors not more than 18 inches from top and bottom of frame.
Space anchors not more than 32 inches o.c.

2.05 FINISHES

- A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.
- B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.
 - 1. Applied to door frames that are to be fully grouted.

2.06 ACCESSORIES

- A. Grout for Frames: Portland cement grout with maximum 4 inch slump for hand troweling; thinner pumpable grout is prohibited.
- B. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.
 - 1. Installed on all doors except on weather/gasketed stripped frames.
 - a. Exterior doors and frames.
 - b. See 08 70 00 Door Hardware for additional locations for gasket seals.
- E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.
- C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

- A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.
- B. Coordinate frame anchor placement with wall construction.
- C. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- D. Install door hardware as specified in Section 08 70 00.
 - 1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.
- E. Coordinate installation of electrical connections to electrical hardware items.
- F. Touch up damaged factory finishes.

3.04 TOLERANCES

- A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.
- B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.05 ADJUSTING

- A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 36 00

OVERHEAD SECTIONAL DOORS (Bid Package A only)

PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Exterior overhead doors/tracks/electric operators with controls/accessories.

1.2 RELATED WORK

- A. Opening preparation, miscellaneous or structural metal work, access panels, finish or field painting, field electrical wiring, wire, conduit, fuses and disconnect switches are in the Scope of the Work of other divisions or trades.

1.3 SHOP DRAWINGS AND PRODUCT DATA

- A. Submit shop drawings and product data per Section 01 33 23, indicating pertinent dimensions, general construction and anchorage methods, installation details and finishes.

1.4 DELIVERY OF MATERIALS

- A. Deliver doors in manufacturer's packaging complete with installation instructions.

PART 2 – PRODUCT

2.1 EXTERIOR INSULATED OVERHEAD DOORS

- A. SECTIONS: "Thermacore" Insulated steel sectional doors. 592 series as manufactured by Overhead Door Corporation or pre-approved equal. Metal/foam/metal sandwich panel construction, with EPDM thermal break and ship-lap design. Each unit shall have the following characteristics:
 1. Panel thickness: 2"
 2. Exterior surface: Ribbed, textured.
 3. Finish: Chosen by Architect from 4 standard colors.
 4. Exterior Steel: .015", hot-dipped galvanized.
 5. End Stiles: 16-gauge with thermal break.
 6. Standard springs: 10,000 cycles. (high cycles)
 7. Insulation: CFC-free and HCFC-free polyurethane, fully encapsulated.
 8. Thermal Values: R-value of 17.5; U-value of .057.
 9. Air infiltration: .08 cfm at 15mph; .08 cfm at 25mph.
 10. Size: 12'-0" x 14'-0" opening.
 11. Other Approved Products: Raynor Standard Thermaseal, Fimbrel Door Corp. ISO/DOR, Midland Garage Door Manufacturing Co.: Model 3EC.

B. TRACK

1. Track is 3" vertical lift and angle mounted (or as recommended by manufacturer to suit loading requirements/clearances). See details for mounting conditions.

C. HARDWARE

1. Hinges and fixtures will be galvanized steel. Full-floating ball-bearing rollers will have hardened steel races. Roller sizes will be adequate for design requirements and limitations.

D. WEATHER-STRIP

1. Weatherstripping: EPDM rubber bulb-type at bottom; header seal and jamb weatherstripping included.

E. OPERATION

1. Operation will be by electric operator Model RSX.

Specifications of Model RSX: U.L. Listed Motor:

½ hp, Voltamatic with ability to adjust to correct voltage (115/208/230V for single phase) (208/230/460v for three phase) without removal or addition of any parts, automatic reset thermal overload.

Provide NEMA Wet Location rated control station and motor/motor housing at WASH BAY 104 locations.

Control System: Microprocessor based with relay motor controls on a Single board. This system shall be capable of monitoring and reporting on a variety of operating conditions including: Current operating status, Current command status, Motor movement status, Current error status (if applicable), Hoist Interlock status (if applicable), External Interlock status, 24VDC status.

Duty Cycle: Standard Duty up to 60 cycles per hour during peak usage.

Run Timers: Maximum run timers in both directions of travel that limit motor run time in the event the clutch slips or some other problem occurs.

Reversing Contactor: Electronic control, delayed on reverse protocol.

Limit Switches: Magnetic type providing absolute positioning with push to set and remote setting capabilities. The limits shall remain synchronized with the door during manual operation and supply power interruptions.

Control Circuit: 3-button control station, provisions for connection of: 2-wire monitored photocell system, 2-wire sensing edges, photocells or other entrapment protection devices, connection of an external 3-wire radio controls and related control devices.

Radio Controls: Include a radio receiver that is dual frequency cycling at 315Mhz and 390Mhz capable of storing 250 single button and/or 250 Open-Close-Stop transmitters with the ability to add and/or delete transmitters individually, identify and store activating transmitter ID(s).

Reduction: Primary is Super Belt, an auto tensioning poly-V flex belt that Does not require adjustment. Secondary is chain and sprockets.

Power Train: Ball bearing.

Clutch: Adjustable disc-type.

Brake: DC Disc type with Progressive Braking.

Mounting: Trolley (drawbar).

Average door speed: 11.5 inches per second.

- F. Entrapment protection: Photoelectric sensors.
- G. Operator controls: Push-button operated control stations with open, close, and stop buttons for surface mounting, and for interior location.
- H. Controllers: Provide 2 remote controllers for each door. Each controller shall be a 2-button transmitter to open East and West door.
- I. Finish: shall be a two-coat baked-on polyester. Color as selected by Architect from manufacturer's standard colors.

2.3 DEFLECTION

- A. Deflection of door in the horizontal position will not exceed 1/120 of the door width.

PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install overhead doors in accordance with manufacturer's recommendations and per drawing details.
- B. Fit, align, and adjust complete door assemblies level and plumb, and to provide smooth operation.

END OF SECTION

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SECTION 08 70 00

HARDWARE (Bid Package A only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Hardware for interior and exterior doors.
- B. Thresholds and weather-stripping for exterior doors.
- C. Gasketing for interior doors.

1.2 RELATED WORK

- A. Section 08 11 13: Hollow Metal Doors and Frames

1.3 REFERENCE STANDARDS

- A. ANSI A115.2 - Door and Frame Preparation for Mortise Locks for 1 3/4" Doors.
- B. ANSI A156.1 - Butts and Hinges.
- C. ANSI A156.2 - Locks and Lock Trim.
- D. ANSI A156.4 - Door Controls (Closers).
- E. ANSI A156.7 - Template Hinges.

1.4 SHOP DRAWINGS AND PRODUCT DATA

- A. Submit shop drawings and product data in accordance with Section 01 33 23.
- B. Indicate locations and mounting heights of each type of hardware.
- C. Supply templates to door and frame manufacturer(s) to enable proper and accurate sizing and locations of cut outs for hardware.

1.5 COORDINATION

- A. Coordinate work of this Section with other directly affected sections involving manufacturer(s) of any internal reinforcement for door hardware.

1.6 QUALITY ASSURANCE

- A. Hardware Supplier: Company, specializing in supplying commercial door hardware with five (5) years experience, approved by manufacturer.
- B. Hardware Supplier's Personnel: Employ an Architectural Hardware Consultant (AHC) to assist in the work of this Section. All scheduling and engineering for this Project shall be the responsibility of the Hardware Supplier.

- C. Underwriter's Laboratories Requirements: Provide sufficient hardware of proper type to qualify every opening so indicated to meet Underwriter's Laboratories label requirements.
- D. Reference manufacturer's standards are minimum acceptable as to all pertinent factors.

1.7 REGULATORY REQUIREMENTS

- A. Conform to Iowa State Building Code for requirements applicable to fire rated doors and frames.
- B. Conform to STATE OF IOWA and ADA regulations for handicapped accessibility.

1.8 CERTIFICATIONS

- A. Architectural Hardware Consultant shall inspect complete installation and certify that hardware and installation has been furnished and installed in accordance with manufacturer's instructions and as specified herein.
- B. Provide two (2) copies of Certifications to Architect.

1.9 KEYING

- A. Door Locks: Keyed, Master Keyed, and Grand Master Keyed into existing system (Schlage) as directed by Architect and Owner.
- B. Supply two (2) keys for each cylinder. Supply two (2) keys for each keyed group.
- C. Keys shall be tagged, indexed, filed, and delivered to Owner.

1.10 OPERATION AND MAINTENANCE DATA

- A. Provide Architect/Engineer with manufacturer's Parts List and Maintenance Instructions for each type of hardware supplied.

PART 2 - PRODUCTS

2.1 HARDWARE

- A. Provide items as listed in schedule at end of this Section to complete function/installation as intended.

2.2 FINISH

- A. Finish, as shown on Hardware Schedule.

2.3 MANUFACTURERS

- A. The numbers listed in the following Hardware Schedule are taken from the following manufacturers and are designated as follows:

- (GJ) Glynn-Johnson Corp./Ives (No Sub)
- (LCN) LCN Closer, Inc. (No Sub)
- (SC) Schlage (No Sub)
- (ST) Stanley Hardware (Hager, McKinney approved)
- (R) Reese (Pemko Approved)
- (V) Von Duprin (No Sub)
- (B) Burns (Rockwood approved)
- (RX) Rixson

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install hardware per manufacturer's recommendations, using proper templates.
- B. Installation shall occur with a qualified installer with a minimum five (5) years experience in the installation of commercial grade hardware. Manufacturer instructions shall dictate templating and installation.
- C. There is to be a pre-installation meeting, coordinated by the General Contractor, to have the hardware supplier and the factory representatives of the locks, closers, and panic exit device companies review the installation procedures for their respective products with the installers.
- D. At completion of the installation turn over to the owner all necessary parts and factory installation manuals covering panic devices, locks, and door closers.
- E. At completion of the installation and before turn over of the project, make final adjustments to door closures and other items of hardware. Leave all hardware clean and fully operable. Should any item be found to be defective, it shall be repaired or replaced as directed.
- F. A factory authorized person is to instruct the Owner's personnel in the proper adjustment and maintenance of door hardware and hardware finishes per manufacturers instructions.
- G. Six-Month Adjustment: Approximately six months after the date of Substantial Completion, the General Contractor, hardware supplier and the hardware installer, accompanied by representatives of the manufacturers of the panic devices, locks, and door closers, shall return to the Project to perform the following work:
 - 1. Examine and re-adjust each item of door hardware as necessary to restore function of doors and hardware to comply with specified requirements.
 - 2. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures.
 - 3. Replace hardware items that have deteriorated or failed due to faulty design, materials, or installation of hardware units.
 - 4. The General Contractor after the walk through shall prepare a written report of current and predictable problems of substantial nature in the performance of the hardware and submit copies to the Owner and Architect as well as the walk through attendees.

3.2 HARDWARE SCHEDULE

- A. All closers, to the greatest extent possible, should be mounted on the room side of corridor doors. All other doors with closers should be mounted either, regular arm, parallel arm, or top jamb as necessary.
- B. Following is a schedule of type of hardware required for the various openings and is intended to cover the principal items but may not include every item required. Furnish all items that are standard for a complete installation. Modify, where necessary, for opening operation and to meet U.L. requirements (verify with Architect). Include any drop plates, brackets, or shoes and rod lengths, as may be required, for installing door closers (verify with Architect). Fasten all jamb brackets and door closers to wood doors with sex bolts.

HEADING 01 – Exterior

Door D101.1

3 EA	HINGE FBB199 4½ X 4½ NRP 626	STA
1 EA	STOREROOM LOCK ND80PD RHO 626	SCH
1 EA	ELECTRIC STRIKE 6211 FSE 24VDC 630	VON
1 EA	SURFACE CLOSER 4111.EDA 689	LCN
1 EA	ARMOR PLATE 8400 34" X 34" B-CS 630	IVE
1 SET	DOOR SEAL 798B 19' BLK	REE
1 SET	DOOR SEAL 815A 1/36" 2/86" AL	REE
1 EA	DOOR SWEEP 967C 36" AL	REE
1 EA	THRESHOLD S205A 36" AL	REE

Card reader by Owner's security contractor on Door D100.1.

Description of function for D101.1:

Always locked. Operated by card reader.

Owner's security contractor will provide card reader system. Hardware supplier shall provide all latching or locking accessories to control door as indicated by the descriptions of function above.

Electric strike hardware shall be powered by the Owner's security contractor. Owner's security contractor shall integrate access control to door hardware.

Electrical contractor, hardware supplier and Owner's security contractor shall coordinate all electrified hardware installations.

HEADING 01A – Exterior

Door D106.4

3 EA	HINGE FBB199 4½ X 4½ NRP 626	STA
1 EA	STOREROOM LOCK ND80PD RHO 626	SCH
1 EA	SURFACE CLOSER 4111.SCUSH 689	LCN
1 EA	ARMOR PLATE 8400 34" X 34" B-CS 630	IVE
1 SET	DOOR SEAL 798B 19' BLK	REE
1 SET	DOOR SEAL 815A 1/36" 2/86" AL	REE
1 EA	DOOR SWEEP 967C 36" AL	REE
1 EA	THRESHOLD S205A 36" AL	REE

HEADING 02 – Wash Bay

Door D104.1

3 EA	HINGE FBB179 4½ X 4½ 626	STA
1 EA	PASSAGE LATCH ND80PD RHO 626	SCH
1 EA	WALL STOP 575 630	BUR

HEADING 02A – Bus Bay to Bus Bay (90-min Fire Rated Door)

Door D106.9

3 EA	HINGE FBB199 4½ X 4½ 630	STA
1 EA	PASSAGE LATCH ND80PD RHO 626	SCH
1 EA	WALL STOP 575 630	BUR

HEADING 03 – Mechanical

Door D102.1

3 EA	HINGE FBB179 4½ X 4½ 626	STA
1 EA	STOREROOM LOCK ND80PD RHO 626	SCH
1 EA	WALL STOP 575 630	BUR

HEADING 04 – Toilet

Door D103.1

3 EA	HINGE FBB179 4½ X 4½ 626	STA
1 EA	PRIVACY LATCH ND40PD RHO 626	SCH
1 EA	WALL STOP 575 630	BUR

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES (BID PACKAGE A ONLY)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Metal stud wall framing.
- C. Tile backing board.
- D. Gypsum wallboard.
- E. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

- A. Section 072100 - Thermal Insulation: Batt insulation.
- B. Section 078400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
- C. Section 079200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

- A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data 2017.
- B. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing 2020.
- C. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing 2015, with Errata (2020).
- D. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures Most Recent Edition Cited by Referring Code or Reference Standard.
- E. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members 2015.
- F. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories 2020.
- G. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board 2017 (Reapproved 2022).

- H. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products 2020.
- I. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board 2020.
- J. ASTM C954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness 2022.
- K. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base 2019.
- L. ASTM C1278/C1278M - Standard Specification for Fiber-Reinforced Gypsum Panel 2017.
- M. ASTM C1396/C1396M - Standard Specification for Gypsum Board 2017.
- N. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber 2021.
- O. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements 2009 (Reapproved 2016).
- P. ASTM E413 - Classification for Rating Sound Insulation 2022.
- Q. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems 2015 (Reapproved 2019).
- R. GA-216 - Application and Finishing of Gypsum Panel Products 2021.
- S. UL (FRD) - Fire Resistance Directory Current Edition.

1.04 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data:
 - 1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.

1.05 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com.

1.06 DELIVERY, STORAGE, AND HANDLING

- A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.
- B. Store metal products to prevent corrosion.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C840 and GA-216.
- B. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
 - 1. Fire-Resistance-Rated Barrier Walls: 2-hour fire barrier wall as indicated on drawings.
 - 2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

- A. Material and Product Requirements Criteria: AISI S201.
- B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
- C. Manufacturers - Metal Framing, Connectors, and Accessories:
 - 1. ClarkDietrich; www.clarkdietrich.com.
 - 2. Jaimes Industries; www.jaimesind.com.
 - 3. MarinoWARE; www.marinoware.com.
 - 4. Phillips Manufacturing Co; www.phillipsmfg.com.
 - 5. R-stud; www.rstud.com.
 - 6. SCAFCO Corporation; www.scafco.com.
 - 7. Steel Construction Systems; www.steelconsystems.com.
- D. Nonstructural Steel Framing for Application of Gypsum Board
- E. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (L/240 at 240 Pa).
 - 1. Studs: C-shaped 6" studs (600S162-43 / 33ksi steel) @ 16" o.c. (18 ga).
 - 2. Runners: U shaped, sized to match studs.
 - 3. Top Track: Deep legged, slotted top track sized to match studs to provide min. 1 1/2" deflection of structural framing.
 - 4. Furring Members: Hat-shaped sections, minimum depth of 1 1/2 inch .
- F. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short to allow min 1 1/2" deflection of structural framing..
- G. Non-structural Framing Accessories:
 - 1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.

2.03 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. Georgia-Pacific Gypsum; www.gpgypsum.com.

2. Gold Bond Building Products, LLC provided by National Gypsum Company; www.goldbondbuilding.com.
 3. USG Corporation; www.usg.com.
- B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
 2. Tile Backer Board: Fiber-reinforced gypsum panels as defined in ASTM C1278/C1278M, suitable for paint finish, of the same core type and thickness may be substituted for paper-faced board.
 - a. USG Fiberock or approved equal
 3. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
 - a. Mold-resistant board is required whenever board is being installed before the building is enclosed and conditioned.
 4. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
 5. Thickness:
 - a. Vertical Surfaces: 5/8 inch (16 mm).
 - b. Ceilings: 5/8 inch (16 mm).
 - c. Multi-Layer Assemblies: Thicknesses as indicated on drawings.

2.04 GYPSUM BOARD ACCESSORIES

- A. Beads, Joint Accessories, and Other Trim: ASTM C1047, galvanized steel, unless noted otherwise.
1. Corner Beads: Low profile, for 90 degree outside corners.
 2. L-Trim with Tear-Away Strip: Sized to fit 1/2-inch (13 mm) thick gypsum wallboard.
 3. Expansion Joints:
 - a. Type: V-shaped metal with factory-installed protective tape.
- B. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.
1. Paper Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
 2. Joint Compound: Setting type, field-mixed.
- C. Finishing Compound: Surface coat and primer, takes the place of skim coating.
- D. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

- A. Metal Framing: Install in accordance with ASTM C1007/AISI S220 and manufacturer's instructions.
- B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.
- C. Studs: Space studs at 16 inches on center (at 406 mm on center).
 - 1. Extend partition framing to structure in all locations.
 - 2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.
- D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

- A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.
- B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.04 BOARD INSTALLATION

- A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Nonrated: Install gypsum board in most economical direction, with ends and edges occurring over firm bearing.
- C. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.
- D. Exposed Gypsum Board in Interior Wet Areas: Seal joints, cut edges, and holes with water-resistant sealant.
- E. Installation on Metal Framing: Use screws for attachment of gypsum board.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as follows:
 - 1. Not more than 30 feet (10 meters) apart on walls and ceilings over 50 feet (16 meters) long.
- B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.06 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
 - 1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
 - 1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.07 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

3.08 PROTECTION

- A. Protect installed gypsum board assemblies from subsequent construction operations.

END OF SECTION

SECTION 09 65 00

RESILIENT BASE (Bid Package A only)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Resilient base.
- B. Accessories and installation.

1.02 REFERENCE STANDARDS

- A. ASTM F1700 - Standard Specification for Solid Vinyl Floor Tile; 2013a.
- B. ASTM F1861 - Standard Specification for Resilient Wall Base; 2016.

1.03 SUBMITTALS

- A. See Section 01 33 23 for submittal procedures.
- B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- C. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

1.04 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified flooring with minimum five years documented experience.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Store all materials off of the floor in an acclimatized, weather-tight space.
- B. Maintain temperature in storage area between 55 degrees F and 90 degrees F.
- C. Protect roll materials from damage by storing on end.

1.06 FIELD CONDITIONS

- A. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F.

PART 2 PRODUCTS

2.01 RESILIENT BASE

- A. Resilient Base: ASTM F1861, Type TV, vinyl, thermoplastic; top set Style B, Cove.
 - 1. Basis of Design: Johnsonite (A Tarkett Company).
 - 2. Manufacturers:
 - a. Armstrong World Industries, Inc.
 - b. Burke Flooring: www.burkeflooring.com/#sle.

- c. Endura Rubber Flooring
 - d. Johnsonite, a Tarkett Company: www.johnsonite.com/#sle.
 - e. Nora Rubber Flooring
 - f. Roppe Corp: www.roppe.com/#sle.
- 3. Height: 4 inch.
 - 4. Thickness: 0.125 inch.
 - 5. Finish/Color: Satin finish. Color as selected from manufacturer's standards.
 - 6. Length: Roll.
 - 7. Accessories: Pre-molded external corners.

2.02 ACCESSORIES

- A. Primers, Adhesives, and Seam Sealer: Waterproof; types recommended by flooring manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive resilient base.

3.02 INSTALLATION - GENERAL

- A. Install in accordance with manufacturer's written instructions.

3.03 INSTALLATION – VINYL BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches between joints.
- B. Miter internal corners. At external corners, use pre-molded units. At exposed ends, use pre-molded units.
- C. Install base on solid backing. Bond tightly to wall and floor surfaces.
- D. Scribe and fit to door frames and other interruptions.

3.04 CLEANING

- A. Remove excess adhesive from base and wall surfaces without damage.
- B. Clean in accordance with manufacturer's written instructions.

END OF SECTION

SECTION 09 91 23

PAINTING & COATINGS (Bid Package A and B)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Surface preparation.
- B. Field application of paints.
- C. Scope: Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
- D. Work required under the following Package:
 - 1. Bid Package A – Bus Barn
 - a. Interior painting.
 - 2. Bid Package B – Pedestrian Bridge Repairs
 - a. Painting of new metal guardrails.
 - b. Painting of all metal bridge structure exposed to view.
 - c. Penetrating sealer for exposed concrete bridge surfaces.

1.02 RELATED REQUIREMENTS

- A. Section 03 30 00: Cast-in-Place Concrete
- B. Section 04 90 98: Miscellaneous Metals
- C. Section 05 90 99: Miscellaneous Metals
- D. Section 08 11 13: Hollow Metal Doors and Frames
- E. Section 09 21 16: Gypsum Wallboard Systems

1.03 REFERENCE STANDARDS

- A. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

1.04 SUBMITTALS

- A. Submit product information for all products being used.
- B. Product Data: Provide complete list of products to be used, with the following information for each:
 - 1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
 - 2. MPI product number (e.g. MPI #47).
 - 3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.
 - 4. Manufacturer's installation instructions.
- C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches in size, illustrating range of colors available for each finishing product specified.
 - 1. Where sheen is specified, submit samples in only that sheen.

2. Allow 30 days for approval process, after receipt of complete samples by Architect.
 3. Paint color submittals will not be considered until color submittals for major materials not to be painted, such as factory finished metals, wood cabinets, wood doors, and floor finishes, have been approved.
- D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
1. See Section 01 60 00 - Product Requirements, for additional provisions.
 2. Extra Paint and Finish Materials: 5 gallons of each color; from the same product run, store where directed.
 3. Label each container with color in addition to the manufacturer's label.

1.05 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site in sealed/labeled containers; inspect to verify acceptability.
- B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- C. Paint Materials: Store at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in ventilated area, and as required by manufacturer's instructions.

1.06 FIELD CONDITIONS

- A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.
- B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.
- C. Do not apply materials when relative humidity exceeds 85 percent; at temperatures less than 5 degrees F above dew point; or damp or wet surfaces.
- D. Minimum Application Temperatures for Paints: 50 degrees F for interiors unless required otherwise by manufacturer's instructions.
- E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

- A. Refer to "Painting and Finishing Schedule" at the end of this section. Where Tnemec is listed for exterior use, no substitution will be accepted. Where Glidden Professional products are listed, equal products, as determined by the Architect/Engineer, as manufactured by Diamond Vogel, Pittsburgh Paints, Benjamin-Moore Co., Tnemec, or Sherwin-Williams, can be offered as a substitute, provided that the following information is submitted and approved by the Architect within thirty (30) days from the date the General Contractor received Architect's approval of painting subcontractor.

1. A revised Schedule of Painting to follow the outline under 3.06 and 3.07 of this section to indicate the following:
 - a. Proprietary product name as appears in Paint Schedule or addenda.
 - b. Proposed product name as it will appear on the label.
 - c. Proposed product catalog number.
 - d. Manufacturer's printed information indicating:
 - (1) Chemical description of product.
 - (2) Spreading rate per gallon for each type surface or use.
 - (3) Dry mil. thickness developed at the above rate.
 - (4) Thinning recommendations to achieve items 2. & 3. above.
 - (5) Dust free time and recoat time.
 2. Samples of each finish for sheen evaluation, abrasive resistance testing, and washability, if required by Architect.
 3. The information and samples prepared and submitted in duplicate.
- B. Contractor shall verify in writing within the 30-day time period that he either intends to apply the proprietary products listed in the Schedule of Painting or shall submit for approval the information required under Paragraph 2.1 for another listed approved manufacturer.

2.02 MATERIALS

- A. Paint, Varnish, Stain, Enamel, and Fillers: Type and brand listed herein.
- B. Paint Accessory Materials: Linseed oil, shellac, mineral spirits, and other materials not specifically indicated herein, but required to achieve the finishes specified of high quality and approved manufacturer.
- C. Paints: Ready-mixed, except field catalyzed coating. Pigments fully ground and maintaining a soft paste consistency capable of readily and uniformly dispersed to a complete homogeneous mixture.
- D. Paints to have good flowing and brushing properties and be capable of dry or curing free of steaks or sags.
- E. Architect will select colors from full range of custom color mixing. No additional compensation for deep tint colors.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Do not begin application of paints and finishes until substrates have been properly prepared.
- B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.
- C. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.
- D. Test shop-applied primer for compatibility with subsequent cover materials.
- E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
 1. Gypsum Wallboard: 12 percent.

3.02 PREPARATION

- A. Clean surfaces thoroughly and correct defects prior to application.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.
- D. Seal surfaces that might cause bleed through or staining of topcoat.
- E. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

3.03 APPLICATION

- A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.
- B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".
- C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
- D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.
- E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.
- F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.
- G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 PROTECTION

- A. Protect finishes until completion of project.
- B. Touch-up damaged finishes after Substantial Completion.

3.05 PAINTING AND FINISHING SCHEDULE (GENERAL)

- E. Prime coats specified below may be omitted where factory-applied shop coats are specified in other sections.
- F. Prime coats specified below may be omitted from existing surfaces to be recoated provided the existing coating is sound.
 - 1. **SURFACES NOT TO BE COATED:** Items having complete factory finish, unless specifically called out to be painted:
 - a. Cast-In-Place Concrete. (Note sealed and epoxy areas.)
 - b. Nonferrous metal.
 - c. Rubber.
 - d. Elastomeric sealants (exterior).
 - e. Casework.
 - f. Face brick and prefinished masonry.

- g. Aluminum windows.
- h. Acoustical tile; acoustic wall panels.
- i. Pre-Finished sheet metal.

3.06 PAINTING AND FINISHING SCHEDULE (EXTERIOR)

- A. Ferrous Metals and Misc. Metals (railings, lintels, bridge structure, etc.):
 - 1. Surface Prep: S.S.P.C SP-6 Commercial Blast.
 - a. Remove all rust from existing structural steel.
 - 2. Primer: Tnemec Series 90-97 @ 2.5-3.0 dry mils.
 - 3. Galvanized items thoroughly wiped with solvent-dampened rags.
 - 4. Intermediate: Tnemec Series 73 @ 2.5-3.0 dry mils.
 - 5. Finish: Tnemec Series 1071 @ 2.5-3.0 dry mils.
- B. Hollow Metal Doors and Frames:
 - 1. Surface Prep: Clean and Dry, lightly sand all surfaces
 - 2. Intermediate: Tnemec Series 73 @ 2.5-3.0 dry mils.
 - 3. Finish: Tnemec Series 1071 @ 2.5-3.0 dry mils
- C. Exposed Concrete Surfaces – Bid Package B – Pedestrian Bridge Repairs
 - 1. Cure concrete a minimum of 3 days prior to application.
 - 2. Surface Prep: Clean and dry (minimum of 24 hrs prior to application), remove all curing compound, form release agents or other contaminants. Seal joints.
 - 3. Mask all surrounding areas.
 - 4. Apply at rate of 100 to 150 SF/gal. and per manufacturer's written instructions for surface conditions.
 - 5. Apply second coat if required for proper coverage/performance.

3.07 PAINTING AND FINISHING SCHEDULE (INTERIOR)

- A. Hollow Metal Doors, Frames. Miscellaneous Metals (if not factory finished or called out to be painted):
 - 1. Spot prime damaged areas with compatible primer.
 - 2. Two (2) coats Glidden Professional Lifemaster Oil Semi-Gloss #1506.
 - i. 1.5 dry mils/coat at primed items.
- B. Concrete Floor – Sealed:
 - 1. Remove surface laitance and other contaminates by water blast and apply by Lumiseal WB Plus by L & M Construction Chemicals, Inc.
- C. Gypsum Board - Paint:
 - 1. One (1) coat Glidden Professional High Hide Wall Primer Sealer #1000.
 - 2. Two (2) coats Glidden Professional Ultra-Hide 150 Eggshell Paint #1412.
- D. Other Surface Called for on Drawings:
 - 1. Provide one (1) coat of appropriate primer-undercoat followed by two (2) coats of finish.

3.08 MECHANICAL AND ELECTRICAL EQUIPMENT

- A. Refer to Mechanical and Electrical Sections with respect to color coding, identification banding of equipment, ducting, piping, and conduit.
- B. Remove grilles, covers, and access panels for mechanical and electrical systems from location and paint separately.
- C. Finish paint primed equipment to color selected.
- D. The painting contractor shall prime and paint insulated and bare pipes, conduits, boxes, insulated and bare ducts, hangers, brackets, collars, and supports except where items are placed or covered with a prefinished coating. Verify items at site with architect prior to painting.
- E. Replace identification markings on equipment when painted over or spattered.
- F. The painting contractor shall paint exposed conduit and electrical equipment occurring in finished areas. Color and texture to match adjacent surfaces.
- G. The painting contractor shall paint both sides and edges of plywood backboards for electrical equipment before installing backboards and mounting equipment on them.
- H. The Mechanical and Electrical Contractor shall color code equipment, piping, conduit, and exposed ductwork in accordance with requirements indicated. Color banding and identification (flow arrows, naming, numbering, etc.).
- I. All exposed fire sprinkler piping is to be painted. See the mechanical plans for general fire sprinkler layout.

END OF SECTION

SECTION 10 14 00

IDENTIFYING DEVICES (Bid Package A only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Interior Wall Signs.
- B. Installation of signage.

1.2 SHOP DRAWINGS

- A. Submit shop drawings and samples in accordance with Section 01 33 23.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Interior Wall Signs (Types A/C/G):
 - 1. Basis of Design: ASI EmBoss Series, manufactured by ASI Sign Co.
 - (1) Basic Design: Room copy silk screened, Room Number raised, Tactile Number, Grade 2 Braille.
 - (2) Sign Types:
 - (a) Room name/number signs (Type A): basic plaque type with text/number and braille.
 - (b) Restroom signs (Type C): Provide male/female/ADA pictograms with name copy and braille.
 - (c) "EXIT" sign (Type G): basic plaque type with text and braille.
 - (d) All signs shall comply with Federal ADA guidelines.
 - (e) Mounting: Tape.
- B. Products as manufactured by ASI Sign Company are specified. Equivalent products by Advance Sign & Engraving, Bayuk Graphic Systems, Inc, Avery Brothers Sign Company, Charleston Industries Inc, LRI Graphics & Signs and Designer Sign Systems are approved. Other manufacturer's submit per Section 01 60 00.

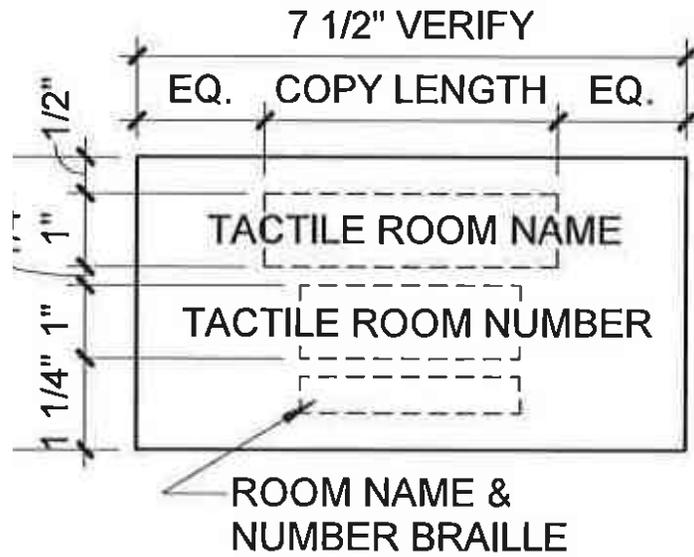
SCHEDULE:

Plaque Signs (Types A/C/G)

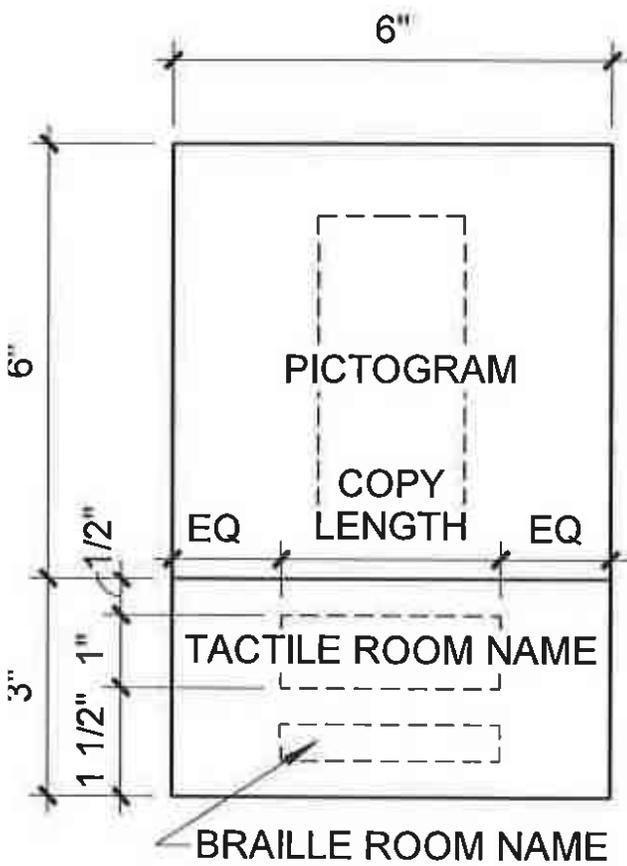
<u>Location</u>	<u>Sign Type</u>	<u>Copy</u>
Door D101.1	G	EXIT
Door D102.1	A	Mechanical
Door D103.1	C	Restroom
Door D104.1	A	Wash Bay
Door D105.1	A	Storage
Door D106.4	G	EXIT
Door D106.9	A	Bus Bays

(D106.9 = Two signs – One each side of wall)

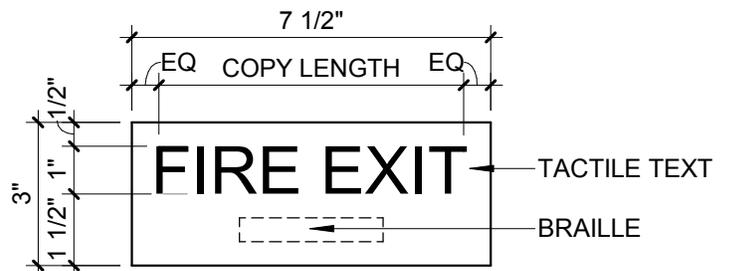
END OF SECTION



TYPE A



TYPE C



TYPE G

SECTION 10 28 00

**TOILET ACCESSORIES
(Bid Package A only)**

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Toilet accessories listed herein.
- B. Rough-in frames supplied to other sections.
- C. Attachment hardware.

1.2 PRODUCT DATA

- A. Submit manufacturer's product data in accordance with Section 01 33 23.
- B. Data to illustrate each accessory at large scale and show installation method.

1.3 DELIVERY, STORAGE, AND HANDLING

- A. Do not deliver accessories to site until rooms in which they are to be installed are ready to receive them.
- B. Pack accessories individually in a manner to protect accessory and its finish.

1.4 PROTECTION

- A. Protect adjacent or adjoining finished surfaces and work from damage during installation of work of this section.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Accessories manufactured by Bobrick. Similar accessories by Charles Parker, Bradley, and Accessory Specialties (ASI), and A.J. Washroom Accessories approved.
- B. Schedule of Accessories: (one per room, unless noted otherwise):

1. Single Toilet Rooms

- a. Mirror: B290 18"W x 36"H
- b. Grab Bar: B5806 x 36"
B5806 x 42"
B5806 x 18"

2. Owner will furnish and install all other toilet accessories.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Deliver inserts and rough-in frames to job site at appropriate time for building-in. Provide templates and rough-in measurements, as required.
- B. Before starting work notify Architect/Engineer, in writing, of any conflicts detrimental to installation or operation of units.
- C. Verify with Architect/Engineer exact location of accessories.

3.2 INSTALLATION

- A. Install fixtures, accessories, and items in accordance with manufacturer's printed instructions.
- B. Install fixtures true, plumb, and level. Anchor to substrate in a secure and rigid manner.
- C. Use tamper-proof fasteners.

END OF SECTION

SECTION 10 44 13

FIRE EXTINGUISHERS (Bid Package A only)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Fire extinguishers.
- B. Fire extinguisher brackets.

1.2 SHOP DRAWINGS

- A. Submit Shop drawings in accordance with Section 01 33 23.
- B. Indicate sizes, dimensions, finishes, and anchors.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

- A. F.E.: Provide extinguisher and wall bracket by fire extinguisher manufacturer.
- B. All fire extinguishers shall be Cosmic 10E, Dry Chemical, U/L rating 4A-60BC.
- C. Above brackets and extinguishers as manufactured by J.L. Industries. Equivalent products as manufactured by The Ansul Co. and Larsen's Manufacturing Co. approved.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install brackets in rigid substantial manner. Follow manufacturer's instructions for installation.
- B. Extinguishers shall be filled and serviced prior to acceptance of building by the Owner.
- C. Installation Heights:
 - 1. Brackets: 42" from floor to bottom of bracket.
- D. Refer to drawings for location.

3.2 CLEANING

- A. Clean aluminum and steel surfaces in accordance with manufacturer's instructions.
- B. Remove debris from work site.

END OF SECTION

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SECTION 13 34 19

PRE-ENGINEERED METAL BUILDING SYSTEMS

(BID PACKAGE A ONLY)

PART 1 GENERAL

1.01 SECTION INCLUDES

- A. Manufacturer-engineered, shop-fabricated structural steel building frame.
- B. Metal wall and roof panels including gutters and downspouts and roof mounted equipment curbs.
- C. Roof and wall insulation

1.02 RELATED REQUIREMENTS

- A. Section 079200 - Joint Sealants: Sealing joints between accessory components and wall system.
- B. Section 081113 - Hollow Metal Doors and Frames.
- C. Section 083613 - Sectional Doors.

1.03 REFERENCE STANDARDS

- A. AISC 360 - Specification for Structural Steel Buildings 2022.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2019.
- C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2023.
- D. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality 2019.
- E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2023.
- F. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2022.
- G. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing 2023.
- H. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2020.
- I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2023b.
- J. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.
- K. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions

120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2022.

- L. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2020.
- M. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification 2021.
- N. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020, with Errata (2023).
- O. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems 2018.
- P. MBMA (MBSM) - Metal Building Systems Manual 2019.
- Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic) 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

- A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

- A. See Section 013000 - Administrative Requirements for submittal procedures.
- B. Product Data: Provide data on profiles, component dimensions, fasteners and insulation.
- C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections, attachments, openings, cambers, and loads; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.
- D. Samples: Submit two samples of precoated metal panels for each color selected, Minimum 12" by 12" inch (____by____ mm) in size illustrating color and texture of finish.
- E. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.
- F. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.
- G. Designer's Qualification Statement.
- H. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.
 - 1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads

and properly assembled components form a complete or partial building shell.

- I. Erector's Qualification Statement.
- J. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.
- K. Project Record Documents: Record actual locations of concealed components and utilities.

1.06 QUALITY ASSURANCE

- A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.
 - 1. Design Engineer Qualifications: Licensed in the State in which the Project is located.
 - 2. Comply with applicable code for submission of design calculations as required for acquiring permits.
 - 3. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.
- B. Perform work in accordance with AISC 360 and MBMA (MBSM).
- C. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.
 - 1. Not less than 5 years of documented experience.
- D. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years experience.
- E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

1.07 WARRANTY

- A. See Section 017800 - Closeout Submittals for additional warranty requirements.
- B. Correct defective Work within a five year period after Date of Substantial Completion.
- C. Provide five year manufacturer warranty for PEMB Structure and Panels.
 - 1. Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

- A. Metal Buildings Systems:
 - 1. Butler Manufacturing Company; www.butlermfg.com.
 - 2. Ceco Building Systems; www.cecobuildings.com.
 - 3. Chief Buildings; www.chiefbuildings.com.
 - 4. Kirby Building Systems, a Nucor Company; www.kirbybuildingsystems.com.
 - 5. Metallic Building Systems; www.metallic.com.
 - 6. Nucor Building Systems; www.nucorbuildingsystems.com.
 - 7. VP Buildings; www.vp.com.
 - 8. Star Building Systems; www.starbuildings.com.

2.02 ASSEMBLIES

- A. Tapered beam.
- B. Primary Framing: Rigid frame of rafter beams and columns, end wall columns, and wind bracing.
- C. Secondary Framing: Purlins and Girts, and other items detailed.
- D. Wall System: Preformed metal panels with sub-girt framing/anchorage assembly, insulation, and liner sheets, and accessory components.
- E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.
- F. Roof Slope: 1 inches in 12 inches (1:12).

2.03 PERFORMANCE REQUIREMENTS

- A. Installed Thermal Resistance of Wall System: R-value of 19.2.
- B. Installed Thermal Resistance of Roof System: R-value of 32.3.
- C. Design structural members to withstand dead load, applicable snow load, and design loads due to pressure and suction of wind calculated in accordance with design load schedule.
- D. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of 1/180 of span.
- E. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.
- F. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 120 degrees F .
- G. Size and fabricate wall and roof systems free of distortion or defects detrimental to appearance or performance.

2.04 MATERIALS - FRAMING

- A. Structural Steel Members: ASTM A36/A36M.
- B. Plate or Bar Stock: ASTM A529/A529M, Grade 50.
- C. Anchor Bolts: ASTM F1554, Grade 55, Class 1A, with hot dip type for protective coating.
- D. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.
- E. Welding Materials: Perform in accordance with AWS D1.1/D1.1M.
- F. Primer: SSPC-Paint 20 zinc rich.
- G. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
 - 1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
 - 2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

2.05 MATERIALS - WALLS AND ROOF

- A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.
- B. Insulation: Batt glass fiber type, unfaced, ASTM E84 Class A, flame spread index of 25 or less where exposed.
 - 1. Roof: R-25 within and parallel with roof purlins + R-11 above and perpendicular to purlins. Provide and install Roof Thermal blocks to achieve R-32.3 / U-0.031 installed insulation values.
 - 2. Walls: R-30 single layer within 8" girt w/ 3/16" x 3" foam thermal tape adhered to face of girts prior to installation of exterior wall panels. Insulation to achieve R-19.2 / U-0.052 values.
 - 3. Vapor Barrier: Simple Saver Syseal Fabric or approved equal. Water Vapor Transmission Rating ≤ 0.02 grains/hr-sf
 - 4. Approved manufacturers:
 - a. Simple Saver System
 - b. MBI Safety Liner
 - c. Energy Craft
- C. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.
- D. Roof Curbs: Insulated metal same as roofing, designed for imposed equipment loads, anchor fasteners to equipment, counterflashed to metal roof system.
- E. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Fascias: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.06 FABRICATION - FRAMING

- A. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.
- B. Anchor Bolts: Formed with straight shank, assembled with template for casting into concrete.
- C. Provide wall opening framing for doors, windows, and other accessory components.

2.07 FABRICATION - WALL AND ROOF PANELS

- A. Siding: Minimum 26 gauge metal thickness, Manufacturer's standard profile, 1.25" inch (____) deep, lapped edges fitted with continuous gaskets.
- B. Roofing: Minimum 24 gauge metal thickness, double-lok standing seam panel .
- C. Liner: Minimum 26 gauge metal thickness, flat profile, lapped V edges.
 - 1. Provide 8' high liner panels at interior face of all exterior walls except at WASH BAY 104.
 - 2. Provide 8' high liner panels at both sides of 2-hour Fire Barrier wall between BUS BAYS 105 & 106.
 - 3. Provide 8' high liner panels at south wall of BUS BAY 105 and west wall of STORAGE 101.
- D. Girts/Purlins: Rolled formed structural shape to receive siding, roofing and liner sheet.
- E. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles.
- F. Flashings, Closure Pieces, Fascia: Same material and finish as adjacent material, profile to suit system.
- G. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

2.08 FABRICATION - GUTTERS AND DOWNSPOUTS

- A. Fabricate of same material and finish as roofing metal.
- B. Form gutters and downspouts of manufacturers standard profile and size to collect and remove water. Fabricate with connection pieces.
- C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.
- D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.09 FINISHES

- A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.

- B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, _____ color as selected from manufacturer's standard range.
- C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of modified silicone finish, _____ color as selected from manufacturer's standard range.

PART 3 EXECUTION

3.01 EXAMINATION

- A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.02 ERECTION - FRAMING

- A. Erect framing in accordance with AISC 360.
- B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.
- C. Set column base plates with non-shrink grout to achieve full plate bearing.
- D. Do not field cut or alter structural members without approval.
- E. After erection, prime welds, abrasions, and surfaces not shop primed.
- F. Wall Girts:
 - 1. Side walls (East and West): 8" By-pass Girts attached to outside face of primary frames.
 - 2. End walls (North and South): 8" Girts inset between frame members with outside face of girt 1" outside face of framing.
- G. Roof Purlins:
 - 1. 8" purlins

3.03 ERECTION - WALL AND ROOF PANELS

- A. Install in accordance with manufacturer's instructions.
- B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.
- C. Fasten cladding system to structural supports, aligned level and plumb.
- D. Locate end laps over supports. End laps minimum 2 inches (50 mm). Place side laps over bearing.
- E. Provide expansion joints where indicated.
- F. Use exposed fasteners.
- G. Install insulation and vapor retarder.
- H. Install sealant and gaskets, providing weather tight installation.

3.04 ERECTION - GUTTERS AND DOWNSPOUTS

- A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.
- B. Slope gutters minimum 1/8 inch/ft.

3.05 TOLERANCES

- A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.
- B. Siding and Roofing: 1/8 inch (3 mm) from true position.

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SECTION 22 05 00 - PLUMBING COMMON REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The plans and specifications contemplate the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many minute items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly herein, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. In receiving bids, it will be assumed that each bidder has made a thorough inspection of the conditions and is familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions prior to submitting the bid will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work specified herein. Attention is directed in particular to the IOWA PLUMBING CODE, UNIFORM PLUMBING CODE, INTERNATIONAL BUILDING CODE AND/OR ANY AUTHORITY HAVING JURISDICTION, and local regulations concerning the specified plumbing equipment.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Bidders shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Architect/Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in

type, function, quality of material and assembly and meet the requirements indicated in drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Submit requests via email. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as acceptable equals for quotations and use, approval will be issued in an addendum.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for approval, prior to the placing of orders for any equipment, a complete schedule of plumbing equipment and fixtures to be installed. The schedule shall consist of catalogs, cuts, diagrams, shop drawings, performance curves or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. The schedules shall list the operating conditions of the equipment at the conditions listed on the schedules. Provide shop drawings in electronic 'PDF' format suitable for use on Submittal Exchange or similar program.
- B. All shop drawings shall be submitted by the Contractor and shall have been signed, "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will check the shop drawings to aid in interpreting the plans and specifications, and in so doing will assume that the shop drawings conform to all specified requirements set forth in this specification. The approval of the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the specification.
- C. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specification are completed as an aid to the Contractor, but where discrepancies arise, it shall not release the Contractor from providing the proper number to complete this work.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 TESTS

- A. Tests shall be performed on the systems Specified herein.
- B. All tests shall be made in the presence of the Engineer. Building official and/or Owner may be present. Engineer shall receive 2 days' notice prior to any testing. The Contractor shall submit a letter for approval containing the name and position of the people who will witness the tests. Where required, perform such tests in the presence of local or state building inspection officials. The Contractor shall maintain reports of all tests as they are performed. The reports shall contain the following information:

1. Project
 2. Contractor
 3. Date
 4. Test performed and portion of system tested
 5. Test results
 6. Name and signature of person performing test
 7. Name and signature of witness of the test
- C. Upon completion of the project the test reports shall be submitted with the operation and maintenance manuals for review by the Engineer.
- D. Soil, waste and vent piping shall be tested in accordance with applicable state and local codes. The minimum test shall be as follows: The water test shall be applied to the drainage and vent systems either in its entirety or in sections. If applied to the entire system, all openings in the piping shall be tightly closed, except the highest opening, and the system filled with water to point of overflow. If the system is tested in sections, each opening shall be tightly plugged except the highest opening of the section under test, and each section shall be filled with water, but no section shall be tested with less than ten (10) foot head of water. In testing successive sections, at least the upper ten (10) feet of the next preceding section shall be tested, so that no joint or pipe in the building (except the uppermost ten (10) feet of the system) shall have submitted to a test of less than a ten (10) foot head of water. The water shall be kept in the system, or in the portion under test, for at least fifteen (15) minutes before inspection starts. The system shall then be tight at all points. All joints shall remain exposed until testing has been completed. At the Contractor's option, an air test may be used in lieu of the water test. The section of piping to be tested shall be pressurized to 5 psig. The piping under test shall be pressurized for at least 15 minutes before inspection starts and shall hold this pressure for at least 15 minutes without introduction of additional air. All joints shall remain exposed until testing has been completed.
- E. Domestic water piping shall be tested and proven watertight under a hydrostatic pressure of 125 psig. The piping system shall maintain the test pressure without loss for 2 hours. Loss shall be determined by a drop in gauge pressure or visual leakage. The test pressure shall be read from a gauge location at the low elevation of the system or portion being tested.
- F. Natural gas piping shall be tested with an air pressure of not less than 25 psig. The system shall hold this pressure for 24 hours without pressure drop except for pressure change due to temperature differential. For natural gas piping which is welded or carrying gas at pressures over 14 inches water column pressure, the test pressure shall be 60 psig. and shall be continued for a length of time satisfactory to the administrative authority, but in no case less than 30 minutes.

3.2 STERILIZATION OF THE WATER SUPPLY

- A. Chlorinate all domestic hot and cold water lines to comply with local and State health regulations.
- B. The chlorinating agent shall be applied at the start of a new line and shall be injected through a corporation cock or similar device, to insure complete chlorination of all pipe.

- C. Calcium hypochlorite shall be used where applicable and shall be commercial products such as H.T.H., Perchloron, or Mexochloron. The calcium hypochlorite shall first be mixed to a homogeneous paste. The paste shall contain approximately five (5) percent available chlorine by weight. The paste shall then be thinned to a slurry and mixed with water to obtain a resultant consistency of 100 parts per million. This mixture shall be fed into the pipeline and retained for a one-hour contact period. All valves shall then be opened in groups of three and water of 100 parts per million calcium chlorite concentration run through for a ten minute interval for each group of valves.
- D. After chlorination, all valves shall be opened and water run through to waste for a ten minute period or until the waste water indicates a residual of not over 0.5 parts per million.
- E. Have an approved independent testing agency test and certify that the potable water system meets the requirements of local health authorities before using for domestic service. Upon completion of the system a representative sample shall be obtained by the testing agency at random outlets on the project. If test sample does not prove to be potable, the entire project's potable water system shall be sterilized by the Contractor at no additional cost to the Owner. Furnish a copy of the test to the Engineer and the local utility.

3.3 ALL EQUIPMENT FURNISHED UNDER DIVISION 22

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.
- C. Run operating test for 30 hour periods and submit data for approval.
- D. All equipment shall be charged with clean media and installation completely finished prior to acceptance.
- E. Properly balance all pumped water systems.

3.4 OPERATION AND MAINTENANCE MANUALS

- A. Prepare one portfolio with one complete set of shop drawings of the equipment used in the erection of the plumbing systems and equipment testing, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, and name and address of authorized service organization.
- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer. Provide manuals in electronic 'PDF' format in addition to the printed copies.

- C. The portfolio shall be submitted to the Engineer for review of material and completeness prior to final inspection, and when approved by the Engineer, the portfolio shall be turned over to the Owner.

3.5 PROJECT CLOSE OUT

- A. The Mechanical Contractor shall arrange for an inspection of all items installed in the ceiling before the ceiling or ceiling tile is installed. The Engineer shall be informed at least one week before the planned installation of the ceiling to arrange the inspection. If the ceiling tile is installed before the inspection, the Mechanical Contractor shall remove all the ceiling tiles prior to the inspection.
- B. General: Refer to Division 1 sections for general closeout requirements. Maintain a daily log of operational data on plumbing equipment and systems throughout the closeout period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Engineer.
- C. Record Drawings: Give special attention to the complete and accurate recording of underground conduit, piping and concealed and non-accessible work, branching arrangement and valve location of all piping systems and work of change orders where not shown on contract documents.
- D. Closeout Equipment/Systems Operations: Sequence operations properly so that work of the project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment with the Owner's operating personnel present to demonstrate sustained, satisfactory performance. Adjust and correct operations as needed for proper operation. Clean and lubricate each system, excessively worn parts and similar expendable parts of the system.
- E. Operating Instructions: Conduct a walk-through instruction seminar for the Owner's personnel to be involved in the operation and maintenance of the plumbing equipment and systems. Explain the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the system.
 - 1. Provide written verification that operating instructions have been provided, signed off by an Owner's Representative.
- F. Turn-Over of Operation: At the time of substantial completion, turn over the prime responsibility for the operation of the system to the Owner's personnel. However until the time of final acceptance, provide at least one full-time operating technician, who is completely familiar with the work, to consult with and continue training the Owner's personnel. Additional training shall take place as specified in other sections.
- G. Final Completion: The following special requirements shall be provided in addition to those specified elsewhere:
 - 1. The Contractor shall not call for final completion check until the plumbing systems and equipment have been installed, adjusted, balanced, and are in full and complete satisfactory operation.

2. Exceptions may be permitted upon written request from the Contractor listing any minor items that are uncompleted and beyond his reasonable control. Provide a full guarantee that they be completed at a named later date and the guarantee shall be extended as required to provide a full warranty.
- H. Final Payment will not be made until the Contractor has satisfactorily completed all final inspection items.
- I. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. The Owner has the right to order repairs to any equipment or work provided hereon and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 22 05 00



Engineering Design Associates, Inc.

385 12th Street, NE
Sioux Center, Iowa 51250
712-722-0228
www.edaengineers.com

PROJECT: CENTRAL LYON CSD - BUS BARN & CABINET REPLACEMENT REDESIGN
EDA PROJECT #: 2249

To All Persons Requesting Files:

At your request, EDA Inc. will provide copies of its Building Information Model ("BIM") for the above-mentioned project.

It is expressly understood that the BIM files are being issued only as supplemental information for the convenience of the Contractor or Construction Manager.

Our electronic files are generated with Autodesk Revit software in the Revit release version utilized by the design team. EDA Inc. makes no representation as to the compatibility of these files with your hardware or your software.

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2024 Facility Improvements
Central Lyon Community School District

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SECTION 22 05 10 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All work done under Division 22 shall be in accordance with the requirements of this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following section shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 INSTALLATION OF THE WORK

- A. The Contractor shall examine all the drawings before proceeding with the layout and installation of his work. General and electrical wiring contract drawings will be made available to this Contractor. SHOULD DISCREPANCIES AFFECTING THE WORK BE FOUND, THE CONTRACTOR SHALL IMMEDIATELY REPORT SAME TO THE ENGINEER FOR INSTRUCTIONS. Subsequent changes made necessary by the neglect of any Contractor to discover and report such discrepancies shall be made by and at the expense of the Contractor, under the direction of the Engineer.
- B. Furnish, provide, and/or install shall be considered as requiring the Contractor to both furnish the equipment and install it unless specific reference is made to the furnishing or installing of the equipment by others.
- C. The Contractor shall confer and cooperate with other Contractors on the job in the installation of his work so all work will be installed in proper relationship to the surrounding location and shape of any part to avoid conflicts. The Contractor shall be responsible for the correct size and location of any changes, slots, and openings required by him and shall be required to do, at his expense, any cutting or patching made necessary by his failure to make proper arrangements in this respect.
- D. Pipes shall be located essentially as shown on the drawings, but in exact locations as laid out by the Contractor on the job to suit actual conditions. Exposed pipes shall be arranged as closely as practical to wall or ceiling surfaces. Indicated connections to equipment are based on equipment of a given manufacturer. If the Contractor proposes to use "approved equal" equipment, then it shall be understood that the Contractor shall assume the responsibility for proper location in a manner approved by the Engineer. Changes made necessary for this reason will be made by, and at the expense of this Contractor.
- E. The Contractor shall follow the equipment manufacturer's instructions and recommendations in the installation and connection of all equipment and materials

furnished under this contract. In the event of conflict or discrepancy between manufacturer's instructions and the contract documents, the Contractor shall notify the Engineer before proceeding. No equipment installation shall be made in a manner that voids the manufacturer's warranty of the equipment.

- F. Any hazardous waste or asbestos required to be removed, encapsulated or otherwise contained during the course of this project shall be performed by the Owner. E.D.A. Inc. shall be indemnified from any and all liability associated with the removal, encapsulation or containment of hazardous waste or asbestos.

3.2 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. If installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated, suitable allowances shall be made by the equipment supplier and/or Contractor.

3.3 RECORD DRAWING

- A. The Architect will furnish the Contractor a set of prints of the plumbing drawings as issued for this contract. The Contractor shall use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job the drawings shall be delivered to the Engineer for a permanent record of the exact location of all equipment, pipe runs, etc., as incorporated in the job.

3.4 CLEANING

- A. Labels, stickers, etc., shall be removed and the entire installation left in a clean, usable condition.
- B. Plumbing equipment, fixtures, tanks, pumps, traps, etc., shall be thoroughly cleaned.

3.5 PAINTING

- A. Finishes of all equipment shall be protected during storage, installation and until final acceptance. Any damage or imperfections shall be "touched up" or if extensive, the entire unit shall be repainted as directed by the Engineer.

3.6 SLEEVES

- A. The Mechanical Contractor shall set and maintain all sleeves. Any pipe passing through building construction including walls, floors, roofs or masonry partitions shall be encompassed with sleeves in accordance with the following. Slab-on-grade penetrations do not require sleeves unless noted otherwise.
- B. All pipe sleeves through slabs, floors, masonry walls and partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.

- C. Sleeves shall be schedule 40 steel pipe. Wall sleeves shall be flush with the wall surface. The top of floor sleeves shall extend 1" above the floor, the bottom of the sleeve shall be flush with the underside of the floor.
- D. The space between the pipe and the sleeves, through fire rated walls and floors shall be protected as designated in Section 22 05 11.
- E. Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. The wall plates shall have set screws or spring locks for clamping to the pipe.
- F. All pipes through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the wall's sound rating.

3.7 EXISTING SERVICES

- A. The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.
- B. All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of service if possible.
- C. All inactive services which are encountered shall be protected, or removed as directed by the Owner, Utility Company, or Municipal Agency having jurisdiction.
- D. When active services must be temporarily interrupted, arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

3.8 ACCESS TO EQUIPMENT

- A. Access shall be provided to all motors, valves, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The General Contractor will provide access panels and doors required in the building construction where shown on the plans. The location of the access openings relative to the plumbing equipment shall be coordinated to assure proper access to the equipment.

3.9 PROTECTIVE DEVICES

- A. All sheaves, belts, drives, couplings, and moving parts shall be protected by OSHA approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

END OF SECTION 22 05 10

SECTION 22 05 11 - PLUMBING FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Through-penetration firestopping in fire rated construction.
 - 2. Through-penetration smoke stopping in smoke partitions.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

1.3 REFERENCES

- A. Underwriters Laboratories
 - 1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XCHR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
 - 1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.4 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

- F. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.5 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption and at other construction gaps.
 - 2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and type of construction and at all separations required to permit building movement and sound or vibration absorption and at other construction gaps.

1.6 SUBMITTALS

- A. Submit in accordance with Section 22 05 00, unless otherwise indicated.
- B. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures, plus the following specific requirements.
 - 1. Details of each proposed assembly identifying intended products and applicable UL system number or UL classified devices.
 - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgements and drawings relating to non-standard applications.

1.7 QUALITY ASSURANCE

- A. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers or UL classified devices.
- B. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping:
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.

2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.9 PROJECT CONDITIONS

- A. Existing Conditions:
1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.
- B. Environmental Requirements:
1. Furnish adequate ventilation if using solvent.
 2. Furnish forced air ventilation during installation if required by manufacturer.
 3. Keep flammable materials away from sparks or flame.
 4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

PART 2 - PRODUCTS

2.1 THROUGH-PENETRATION FIRESTOPPING AND FIRE-RATED CONSTRUCTION

- A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free.
1. Additional Requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
 2. Acceptable Manufacturers and Products:
 - a. Manufacturer shall be 3M, Hilti or S.T.I.
 - b. Products shall be listed in the UL Fire Resistance Directory for the UL system.
 3. All firestopping products must be from a single manufacturer.

2.2 SMOKE STOPPING AT SMOKE PARTITIONS

- A. Through-Penetration Smoke-Stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.3 ACCESSORIES

- A. Fill, Void or Cavity Materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming Materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where rated walls are constructed with horizontally continuous air space, double width masonry or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.
- F. Install smoke stopping as specified for firestopping.

3.4 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 22 05 11

SECTION 22 05 13 - ELECTRICAL PROVISIONS OF PLUMBING WORK

PART 1 - GENERAL

1.1 ELECTRIC MOTORS

- A. All electric motor driven equipment being furnished and installed under these specifications shall be complete with electric motors, unless specified otherwise. Bearings shall be ball type with lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA Standards, and shall bear the stamp of approval of the Underwriters Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, open drip proof, unless specified otherwise.
- B. Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate rating shall not be less than 120 percent of the driven unit brake horsepower requirements.
- C. Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.

1.2 MOTOR STARTERS

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all motor starters will be furnished and installed by the Electrical Contractor.

1.3 ELECTRICAL WIRING

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all electric wiring shall be furnished and installed by the Electrical Contractor. The Electrical Contractor will make one power connection to each item of plumbing equipment, unless specified otherwise.
- B. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications all disconnects shall be furnished and installed by the Electrical Contractor.
- C. All control wiring and controls as noted on the drawings and/or as specified in these specifications shall be furnished and installed by this Contractor, unless specifically noted otherwise.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify proper motor rotation at equipment startup.

END OF SECTION 22 05 13

SECTION 22 05 15 - EXCAVATION FOR UTILITIES

PART 1 - GENERAL

1.1 EXCAVATION WORK

- A. Excavation shall be as indicated on the drawings. Perform excavation work in compliance with applicable requirements of governing authorities having jurisdiction. Comply with applicable portions of the International Building Code. The testing laboratory hired to perform testing and inspection service during backfill shall be hired by the contractor not the subcontractor.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

1.3 JOB CONDITIONS

- A. Locate existing utilities in work areas. If utilities are to remain in place, provide adequate means of support and protection during excavation operations. Should uncharted utilities be encountered during excavation consult utility owner immediately for directions. Cooperate with building owner and utility companies in keeping all services in operation. Repair damaged utilities to the satisfaction of the utility owner.
- B. No explosives shall be used.
- C. Barricade open excavations and post with warning lights. Operate warning lights as recommended by authorities having jurisdiction. Protect structures, utilities, sidewalks, pavements and other facilities from damage caused by settlement, lateral movement, undermining, washout and other hazards created by earthwork operations.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. Satisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups GW, GP, GM, GC, SW, SP, SM and SC.
- B. Unsatisfactory soil materials are defined as those complying with ASTM D2487 soil classification groups ML, MH, CL, CH, OL, OH and PT.
- C. Satisfactory fill materials shall be satisfactory soil materials free of clay, rock or gravel larger than 2" in any dimension, debris, waste, frozen materials, vegetable and other deleterious matter.

PART 3 - EXECUTION

3.1 EXCAVATION

- A. Slope sides of excavations to comply with local codes and ordinances having jurisdiction. Shore and brace where sloping is not possible because of space restriction or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- B. Shoring and Bracing: Provide materials for shoring and bracing such as sheet piling, uprights, stringers and cross braces in good condition. Comply with requirements of local codes and authorities having jurisdiction for trench shoring and bracing. Maintain shoring and bracing in trenches regardless of time trenches will be open. Carry down shoring and bracing as work progresses.
- C. Prevent water from flowing into excavations and flooding project site and surrounding area. Do not allow water to accumulate in excavations. Remove water to prevent softening of foundation bottoms, undercutting footings and detrimental soil changes. Provide and maintain pumps and other equipment needed to convey water away from excavations.
- D. Stockpile excavated materials until required for backfill. Place grade and shape stockpiles for proper drainage. Locate and retain materials away from the edge of trenches.
- E. Trenches shall be dug to the uniform width required for the particular item to be installed, sufficiently wide to provide ample working room. Provide 6" to 9" clearance on both sides of pipe or conduit.
 - 1. Excavate trenches to depth indicated or required. Carry depth of trenches to establish indicated flow lines and elevations. Beyond building perimeter, keep trenches deep enough to prevent freeze-ups.
 - 2. Where water is encountered within 12" of the pipe invert, carry excavation a minimum of 6" below required elevation and backfill with crushed stone or gravel prior to installation of pipe.
 - 3. For pipes 5" or less in nominal size hand excavate bottom cut to required depth and support pipe on undisturbed soil.
 - 4. For pipes 6" and over excavate to 6" below required depth.
 - 5. Unless otherwise indicated excavate for exterior piping so top of piping is at least 4'-6" below grade.
 - 6. Grade bottom of trenches notching under pipe to provide solid bearing for entire pipe body.
- F. Protect all trench bottoms from freezing.

3.2 COMPACTION

- A. Control soil compaction during construction providing minimum percentage of density as specified below.

1. Slabs, roads and paved areas: Compact each layer of backfill to a minimum of 95% maximum density.
 2. Lawn or unpaved areas: Compact each layer of backfill to a minimum of 92% maximum density.
 3. Walkways: Compact each layer of backfill to a minimum of 95% maximum density.
- B. Moisture in the soil shall be controlled to plus or minus 2% of optimum moisture when the soil is placed. 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. Remove and replace, or scarify and dry soil material that is too wet to permit compaction to proper density. Soil that has been removed because it is too wet for compaction may be stockpiled or spread to allow to dry.

3.3 BACKFILL

- A. Place acceptable soil material in layers to required subgrade elevations. Use subbase material under pipes where indicated. Shape to fit bottom 90 degrees of pipe cylinder.
- B. Backfill excavations as soon as possible but not until the completion of the following.
1. Inspection, testing, approval and recording locations of underground utilities.
 2. Removal of shoring and bracing, and backfilling of voids with satisfactory materials.
 3. Removal of trash and debris.
- C. Place backfill in layers not more than 8" in loose depth for material compacted by heavy equipment, and not more than 4" for hand operated tampers. Before compaction, moisten or aerate each layer as needed to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or relative dry density for each area classification. Place backfill materials evenly adjacent to structures and piping to required elevations. Take care to prevent displacement of piping by carrying material around piping to approximately the same elevation in each lift.

3.4 FIELD QUALITY CONTROL

- A. Quality Testing Control During Construction: Allow testing service to inspect and approve backfill layers before further construction work is performed.
1. Perform field density tests in accordance with ASTM D 1556 (sand cone method), ASTM D 2167 (rubber balloon method) or ASTM D 2922 (nuclear method), as applicable. When ASTM D 2922 is used, the calibration curves shall be checked and adjusted using only the sand cone method as described in ASTM D 1556. ASTM D 2922 results in a wet unit weight of soil and when using this method, ASTM D 3017 shall be used to determine the moisture content of the soil. The calibration curves furnished with the moisture gages shall be checked along with density calibration checks as described in ASTM D 3017. The calibration checks of both the density and moisture gages shall be made at the beginning of the job, on each type of material encountered and at intervals as directed by Architect/Engineer.
 2. In each compacted backfill layer, make one field density test for every 200 ft. of trench.

- B. If in the opinion of the Architect/Engineer, based on testing service reports and inspection, fills which have been placed are below specified density, provide additional compaction at no added charge. The contractor shall be responsible for the cost of any re-testing required by failed tests.

3.5 MAINTENANCE

- A. Where settling is measurable or observable at excavated areas during general project warranty period, remove surface (pavement, lawn or other surface) add backfill material, compact and replace surface treatment. Restore appearance, quality and condition of surface or finish of adjacent work and eliminate evidence to greatest extent possible.

END OF SECTION 22 05 15

SECTION 22 05 16 - CONCRETE BASES

PART 1 - GENERAL

1.1 REQUIREMENTS

- A. Concrete bases required for water heaters, water softener, air compressor and car wash equipment inside the building shall be furnished by the General Contractor. After the bases are poured they shall set at least five (5) days before mounting.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

PART 2 - PRODUCTS

2.1 CONSTRUCTION

- A. Indoor bases shall be four inches deep.

PART 3 - (NOT APPLICABLE)

END OF SECTION 22 05 16

SECTION 22 05 23 - VALVES

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Provide factory-fabricated valves recommended by manufacturer for use in service indicated. Provide valves of types and pressure ratings indicated; provide proper selection as determined by Installer to comply with Installation requirements. Provide end connections which properly mate with pipe, tube, and equipment connections. Where more than one type is indicated, selection is Installer's option.
- B. Sizes: Unless otherwise indicated, provide valves of same size as upstream pipe size.
- C. Operators: Provide handwheels, fastened to valve stem, for valves other than quarter-turn. Provide lever handle for quarter-turn valves, 6" and smaller. Provide gear operated handwheels for valves larger than 6".

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings
 - 4. 22 05 24 - Gas Pressure Regulators
 - 5. 22 05 29 - Pipe Supports and Anchors

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 22 05 00.
- B. Indicate pressure and temperature classifications and joining methods for all types of valves used in the project.

1.4 STANDARDS

- A. All valves shall meet the standards of the Reduction of Lead in Drinking Water Act and SDWA Safe Water Drinking Act pertaining to potable water systems.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. The following valve manufacturers shall be approved: Apollo, Milwaukee, Nibco, Watts/Febc and Zurn/Wilkins.

2.2 BALL VALVES

- A. Bronze ball valves shall be Nibco No. T-585-LF threaded, S-585-LF solder, full port, 125 PSI steam, 400 PSI WOG. Valves shall conform to MSS SP-110. Furnish with extended lever handle.

2.3 GAS VALVES

- A. Gas valves 4" and smaller shall be Nibco model T-FP-600A. Valve shall be ball style with forged brass body, brass chrome plated or stainless steel ball, PTFE packing and seat and threaded NPT connections. Valve shall be listed and labeled as meeting ASME B16.33 and marked 125G, rated for 125 psig natural gas and propane service.

2.4 AIR VALVES

- A. Compressed air valves shall be Apollo No.93-100 carbon steel body, ball type and conform to federal specification WW-V35B, CLASS D, with 1500 PSI WOG.

2.5 BACKFLOW PREVENTER (DOMESTIC WATER SYSTEM)

- A. Backflow preventer shall be Febco model LF850 (1/2" to 2"). Double check backflow preventer shall consist of two independently acting in-line check cartridges, two full ported ball valve shut-offs and four test cocks. There shall be a single access cover for access to the first and second check. Mainline valve body and cap shall be bronze. Assemblies shall be certified in compliance with ASSE 1015 and AWWA C510.
 - 1. Strainer shall be Febco model LF650A. Wye strainer shall be constructed of bronze with female pipe threads in accordance with ANSI/ASME B1.20.1 and include a blow-off connection in the cap. The screen shall be 40 mesh stainless steel. The assembly shall be rated for 175 PSI MWWP.

2.6 VACUUM BREAKERS

- A. Water heater vacuum breakers shall be Watts model LFN36-M1, tested and rated for ANSI Z21.22, brass body, protective cap.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.
- B. Install valves with stems pointed up, in vertical position where possible, but in no case with stems pointed downward from horizontal plane unless unavoidable. Install valve drains with hose-end adapter for each valve that must be installed with stem below horizontal plane.
- C. Install extended-stem valves, where insulation is indicated, arranged in proper manner to receive insulation.

D. Backflow preventers shall be installed between 12" and 60" above finished floor.

3.2 SELECTION

A. Select and install valves with the following ends or types of pipe-tube connections:

1. Tube Size 2" and Smaller: Soldered joint valves.
2. Pipe Size 2" and Smaller: Threaded valves.
3. Pipe Size 2-1/2" and Larger: Victaulic or flanged. Gas shall be flanged only.

END OF SECTION 22 05 23

SECTION 22 05 29 - PIPE SUPPORTS AND ANCHORS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. The hangers shall adequately support the piping system. They shall be located near or at changes in piping direction and at concentrated loads. They shall provide vertical adjustment to maintain pitch required for proper drainage. They shall allow for expansion and contraction of the piping.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings
 - 4. 22 05 23 - Valves
 - 5. 22 07 00 - Plumbing Insulation

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 22 05 00.
- B. Indicate pipe hangers to be used for each size and type of pipe.

PART 2 - PRODUCTS

2.1 HANGERS

- A. Hangers shall be constructed of malleable or wrought iron, and hangers supporting copper pipe shall be copper plated. Hangers for pipe 3 inches and smaller shall be adjustable swivel ring, Anvil Figure 69, galvanized and Anvil Figure CT-69, copper plated. For piping above 3 inches, hangers shall be adjustable, clevis type, Anvil Figure 260 or 300.
- B. Provide hanger rods complete with adjusting and lock nuts. Minimum hanger rod diameter shall be 3/8". Hanger rod loading shall not exceed the following values:
 - 1. 3/8" Rod: 610 lbs.
 - 2. 1/2" Rod: 1,130 lbs.
 - 3. 5/8" Rod: 1,810 lbs.
 - 4. 3/4" Rod: 2,710 lbs.
 - 5. 7/8" Rod: 3,770 lbs.
 - 6. 1" Rod: 4,960 lbs.
 - 7. 1-1/4" Rod: 8,000 lbs.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Where groups of three or more pipes occur, they may be supported with trapeze hangers using two hangers as specified with a capped pipe cross member.
- B. Pipe hangers shall not be attached to the roof or floor decks. Hangers shall be attached to the steel construction with beam clamps, beam attachment and brackets bolted to joists and beams. The Contractor shall endeavor to hang near joist panel joints wherever possible.
- C. Pipe hangers for insulated piping shall be large enough to encompass the insulation, using a metal shield so the vapor barrier jacket will not be broken. See Section 22 07 00, Plumbing Insulation.
- D. Hanging from one pipe to another is prohibited.
- E. Install lateral bracing with pipe hangers and supports to prevent swaying.
- F. Pipe hangers shall be installed with the following spacing:
 - 1. Horizontal Steel Pipe:
 - a. Pipe Size: Up to 1-1/4" Maximum Spacing: 8 Feet
 - b. Pipe Size: 1-1/2" to 3" Maximum Spacing: 10 Feet
 - c. Pipe Size: 4" to 6" Maximum Spacing: 12 Feet
 - 2. Horizontal Copper Pipe:
 - a. Pipe Size: 1/2" to 3/4" Maximum Spacing: 5 Feet
 - b. Pipe Size: 1" Maximum Spacing: 6 Feet
 - c. Pipe Size: 1-1/4" Maximum Spacing: 7 Feet
 - d. Pipe Size: 1-1/2" to 2" Maximum Spacing: 8 Feet
 - 3. Horizontal cast iron soil pipe shall be supported at five foot intervals except where 10 ft. lengths of pipe are used, 10 ft. intervals may be used.
 - 4. Horizontal and vertical plastic pipe shall be supported 4'-0" on center.
 - 5. Vertical piping except plastic shall be supported at each floor.
- G. Install hangers within 12 inches of horizontal tees, elbows, joints, valves, strainers and other specialties and equipment.

END OF SECTION 22 05 29

SECTION 22 05 53 - PLUMBING IDENTIFICATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All piping and plumbing equipment shall be identified as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 22 05 00. The shop drawings shall indicate the materials used, colors and lettering for all piping and equipment labels. Furnish a complete list of equipment labels to be furnished for the project.

1.4 STANDARDS

- A. Comply with ANSI A13.1 for lettering size, length of color field and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturer shall be Allen Systems, Brimar, Kolbi, W. H. Brady, Industrial Safety Supply or Seton Name Plate.

2.2 PIPE MARKERS

- A. PLASTIC PIPE MARKERS; Snap-On Type: Provide manufacturer's standard pre-printed, semi-rigid, snap-on, color coded pipe markers complying with ANSI A13.1.
- B. PLASTIC PIPE MARKERS; Pressure-Sensitive Type: Provide manufacturer's standard pre-printed, permanent adhesive, color coded pressure sensitive vinyl pipe markers complying with ANSI A13.1.
- C. Small Pipes: For external diameters less than 6"(including insulation), provide full band pipe markers, extending 360 degrees around pipe at each location fastened by one of the following methods.
 - 1. Snap on application of pre-tensioned semi-rigid plastic pipe marker.
 - 2. Adhesive lap joint in pipe marker overlap.
 - 3. Laminated or bonded application of pipe marker to pipe or insulation.
 - 4. Taped to pipe or insulation with color coded plastic adhesive tape at least 2" wide with a full circle at both ends of pipe marker, tape lapped 4".

- D. Large Pipes: For pipe diameters 6" and larger (including insulation), provide either full-band or strip type pipe markers, no narrower than 3 times letter height, and of required length fastened by one of the following methods:
 - 1. Laminated or bonded application of pipe marker to pipe or insulation.
 - 2. Taped to pipe or insulation with color-coded plastic adhesive tape, not less than 2" wide with a full circle at both ends of pipe marker. The tape shall be lapped 4" at both ends.
 - 3. Strapped-to-pipe or insulation application of semi-rigid type with manufacturer's standard stainless steel bands.
- E. Lettering shall be the manufacturer's standard pre-printed nomenclature which best describes the piping system in each instance, or as selected by the engineer in cases of variance with names as shown or specified.
- F. Arrows shall be printed on each pipe marker indicating direction of flow, either integrally with the piping system service lettering or as a separate unit of plastic.
- G. Plastic tape shall be manufacturer's standard color coded pressure sensitive vinyl tape not less than 3 mils thick. Tape for pipe with outside diameters (including insulation) less than 6" shall be 1-1/2" wide. Tape for larger pipes shall be 2-1/2" wide.
- H. Stencils: Minimum 1 inch high lettering and arrows. One coat of dark enamel against a light background or one coat of white enamel against a dark background.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Where identification is to be applied to surfaces requiring insulation, painting or other covering; the identification shall be installed after completion of the painting and insulating.
- B. Any identification referencing a room name or number shall not use the room name and number listed on the project drawings as these names and numbers are for reference only. The Architect, Owner and Contractors shall coordinate all room names and numbers to be used on any identification.

3.2 INSTALLATION

- A. Pipe stencils or markers shall be installed on each system including arrows to indicate the direction of flow. Locate pipe markers and color bands or stencils as follows wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces, plenums and exterior locations.
 - 1. Near each valve and control device.
 - 2. Near each branch, excluding short take-offs for fixtures and terminal units.
 - 3. Where pipes pass through walls floors or ceilings.
 - 4. Near major items and other points of origination and termination.

5. Spaced intermediately along pipe runs at a maximum distance of 50', reduce spacing to 25' in congested areas of piping and equipment.
6. On piping above lay-in ceilings.

END OF SECTION 22 05 53

SECTION 22 07 00 - FIBERGLASS PLUMBING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All rigid piping on the project shall be insulated as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.

1. 22 05 00 - Plumbing Common Requirements
2. 22 05 10 - Basic Materials and Methods
3. 22 11 10 - Pipes and Pipe Fittings
4. 22 05 23 - Valves
5. 22 05 29 - Pipe Supports and Anchors

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 22 05 00. Include shop drawings for each type of insulation and duct liner to be used on the project.

1.4 QUALITY ASSURANCE

- A. All covering and insulation materials used on this project shall have the manufacturer's name on the container. All materials must be dry and in good condition.
- B. All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM E-84, NFPA 255 and U.L. 723 not to exceed 25 flame spread and 50 smoke developed.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Insulation materials shall be as listed, or approved equal.

2.2 MATERIALS

- A. Fiberglass pipe insulation shall be Johns Manville Micro-Lok HP, Owens Corning SSL II with ASJ Max, or Knauf 1000° fiberglass pipe insulation with factory applied all-service jacket. Insulation shall be rated for use between -0°F and 850°F. Insulation shall have a maximum flame spread rating of 25 and a maximum smoke rating of 50 and UL listed and labeled for installation on PVC or polypropylene piping to maintain a maximum flame spread rating of 25 and a maximum smoke rating of 50. The all service jacket shall be furnished with self-sealing lap. Thermal conductivity shall be 0.22 BTU-in/hr., SF, °F at 100°F mean temperature. All end joints shall be sealed with 3" wide butt strips of materials identical to pipe covering jackets.

- B. PVC pipe jacket shall be Prato "LoSmoke" PVC or equal, white in color. Jacket shall not exceed 25 flame spread and 50 smoke developed ratings.

PART 3 - EXECUTION

3.1 PIPE INSULATION

- A. Insulation Thickness: The following systems shall be insulated with the following thickness of fiberglass insulation:

- 1. Domestic Hot Water
 - a. 1/2" to 1-1/4" = 1"
 - b. 1-1/2" and Larger = 1-1/2"
- 2. Domestic Cold Water
 - a. All Sizes = 1"

- B. Installation

- 1. All valves, fittings and all other specialties in the piping shall be insulated per the requirements of the system they serve.
- 2. Plumbing vents within six lineal feet of the roof outlet shall be insulated with 1" thick fiberglass insulation.
- 3. All pipe insulation shall be installed in accordance with the manufacturer's instructions. All longitudinal joints shall be sealed with factory applied self-sealing laps. All end joints shall be sealed with 3" wide butt strips of materials identical to pipe covering jackets, using adhesive such as Benjamin Foster 30-35 or self-sealing jacket. No stapling shall be permitted on any vapor barrier jackets. No vapor barrier work or self-sealing laps or lap work shall be performed when temperatures are below 40°F.
- 4. Insulate all fittings, valves, flanges and strainers with mitered segments of pipe insulation wired in place. Coat each fitting with two 1/8" coats of an approved vapor barrier mastic such as Benjamin Foster 30-35. Reinforce each fitting by wrapping with glass fabric cloth extending 2" onto adjacent pipes and finish with an additional coating of mastic worked into mesh of cloth to provide a smooth finish. Cover with 6 ounce canvas cover in all exposed areas. At the contractor's option, pre-molded plastic fitting covers may be used if taped and sealed and completely filled with insulation. A continuous vapor barrier must be maintained on all cold piping systems. Corner beads shall be used on all square corners.
- 5. A continuous vapor barrier shall be maintained on all domestic cold water piping systems. All pipe hangers on these systems shall be installed outside the insulation with insulation shields installed to protect the insulation. Any damage to the vapor barrier shall be repaired with an approved vapor barrier mastic.
- 6. All fiberglass insulation exposed to outdoor weather conditions and all piping in Wash Bay 104 shall be additionally covered with a 20 mil PVC jacket sealed water tight.
- 7. All fiberglass insulation exposed in occupied areas within 9 feet of the floor and all exposed insulation in Wash Bay 107 shall be covered with a PVC jacket.

8. Insulation shields shall be installed between insulation and pipe hangers. Shields shall be of sufficient size to prevent damage to the insulation.
9. The cold water main from the building entrance to the meter shall be insulated.

END OF SECTION 22 07 00

SECTION 22 11 10 - PLUMBING PIPES AND PIPE FITTINGS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install where shown on the drawings and required to connect fixtures and equipment, pipe and fittings of type and material for the various services as noted below.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 05 11 - Plumbing Firestopping
 - 4. 22 05 23 - Valves
 - 5. 22 05 29 - Pipe Supports and Anchors
 - 6. 22 07 00 - Plumbing Insulation

1.3 SUBMITTALS

- A. Submit shop drawings in accordance with Section 22 05 00. Indicate ASTM or ANSI ratings, pipe and fitting weights, pressure and temperature classifications and joining methods for all types of piping used in the project.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER MAINS

- A. Domestic water main piping from the meter to 5' outside the building shall be type K, ASTM B88, soft drawn copper tubing. Fittings shall be McDonald copper flare fittings or equal.

2.2 DOMESTIC WATER PIPING

- A. Domestic cold and hot water pipe in building above floor shall be type L, ASTM B88, hard drawn copper tubing. Fittings shall be wrought copper solder type ANSI B16.22. Joints for pipe and fittings shall be made with non-corrosive flux and 95-5 solder. The maximum lead content of the flux and solder shall be 0.2% by volume. Viega Pro-Press, Apollo Press and Nibco Press-Fit may be used in lieu of soldered fittings.

2.3 SANITARY SEWER, ROOF DRAIN AND VENT PIPE

- A. PVC Below Floor and Above Floor
 - 1. Sanitary sewer, roof drain and vent piping in building below floor to 5' outside building and above floor shall be as follows:

- a. PVC-DWV, Schedule 40, ASTM D2665-85 pipe and fittings. Join pipe using primer meeting ASTM F656-80 and solvent cement meeting ASTM D2564-80.

2.4 CAR WASH WATER HEATER INTAKE AND EXHAUST PIPING

- A. Car wash water heater combustion air intake piping shall be schedule 40, PVC, ASTM D1785, pipe and fittings.
- B. Car wash water heater exhaust piping shall be schedule 40, CPVC, ASTM F441, pipe and fittings.

2.5 NATURAL GAS PIPE

- A. Natural gas piping and regulator vent piping shall be schedule 40 black steel pipe ASTM A53. Fittings for low pressure (10" W.C. and lower) exposed piping smaller than 2 inches or smaller shall be standard weight black malleable iron screwed fittings, ANSI 16.3. Fittings for pipe 2 inches and larger, medium pressure pipe (over 10" W.C.) and all piping in concealed locations shall be welding type ANSI 16.5. There shall be no unions installed in concealed locations. A manual shut-off valve and union shall be installed at each item of mechanical equipment with a gas connection.
 - 1. At the Contractor's option Viega "MegaPressG" cold press mechanical joint fittings are permitted to be used in sizes up to 4" in lieu of threaded fittings where not installed in concealed locations. Fittings shall be constructed of zinc nickel coated carbon steel with 420 stainless steel grip ring and 304 stainless steel separator ring conforming to material requirements of ASTM A420 or ASME B16.3 and performance criteria ANSI LC-4/CSA 6.32 and the latest edition of NFPA 54. Sealing elements shall be HBNR, factory installed. Fittings shall be designed for use with schedule 40 black steel piping with a maximum pressure rating of at least 125 psig and design operating temperature range of -40°F to 180°F.
- B. Final connections may be made with corrugated stainless steel tubing complying with ANSI LC-1 and listed with CSA. Tubing shall be ASTM A240 Type 300 corrugated stainless steel with a UV resistant polyethylene jacket. ASTM E-84 flame spread rating shall not exceed 25, and smoke spread rating shall not exceed 50. Fittings shall be brass flare sealing type. Tubing shall have a maximum allowable working pressure of 5 psig and shall be tested to 50 psig. Tubing shall be as manufactured by Gastite; Omegaflex will be accepted as equal.
- C. Natural gas piping outside the building underground shall be PE 2406 medium density polyethylene pipe and fittings meeting cell classification 345444C or 345444E per ASTM D3350. Pipe shall have a standard grade HDB rating of 1600 psi at 73°F. Pipe shall be manufactured in accordance with ASTM F714 or ASTM D3035. Molded fittings shall conform with ASTM D3261. Piping shall be identified by co-extruding (4) equally spaced yellow strips into the outside surface of the piping. Pipe backfill shall be Class 1 or 2 material placed and compacted to at least 90% density in 6" lifts to at least 6" above the pipe crown. Pipe shall be pressure tested per manufacturers recommendations. Approved piping can be purchased from local gas company. Provide trace wire above gas pipe and terminate inside building.

2.6 COMPRESSED AIR PIPING

- A. Compressed air piping shall be as follows:
 - 1. Schedule 40 black steel pipe ASTM A53. Fittings shall be standard weight black malleable iron screwed fittings ASTM 16.3.
 - 2. Aluminum piping conforming to ASME B31.3 and nickel plated brass fittings. Tubing shall have a maximum working pressure of 220 PSI, and working temperatures between -4°F and 176°F. Fitting seals shall be nitrile rubber.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. All pipes shall be round and straight, of required size. Cutting shall be done with proper tools and pipes shall be reamed to full size after cutting.
- B. Piping shall be properly enclosed, supported, guided, anchored, sway braced, connected, tested, cleaned and flushed out and shall be properly insulated and protected where required.
- C. Pipe sizes shown on the drawings are nominal pipe sizes and not outside diameters unless noted otherwise.
- D. Pipes shall be run substantially as indicated on the drawings. However, the architect/engineer reserves the right to require this Contractor to make minor changes in pipe locations where conflicts occur with other trades. Such changes shall be made without extra cost to the Owner.
- E. Piping shall be installed with ample provisions for expansion and contraction to prevent injury to the same and to the building construction. Such provision shall be made by means of piping offsets, changes in direction, expansion loops and/or suitable expansion joints. Suitable anchors and guides shall be provided to permit proper deflection and compression of offset loops and expansion joints. Expansion joints shall not be used in lieu of offsets, changes in direction or loops, except where specified and/or indicated on the drawings or where otherwise obviously necessary. Penetrating a framing member to within 1-1/2 inch of the exposed framing shall be protected by steel nail plate not less than 18 gauge in thickness. The steel plate shall extend along the framing member not less than one and one-half inch beyond the outside diameter of the pipe for a vertical pipe. This includes top and bottom plate protection. Horizontal piping running through studs shall be protected with a stud shoe installed on the front and both sides of the stud. The stud shoe shall be a minimum of one and one-half inch wide and fastened to each stud on the front and both sides with not less than 16d nails. In bearing walls a stud may be cut to a depth not exceeding 40 percent of the width. In non-loadbearing stud the hole may not exceed 60 percent of the width. In no case shall the hole be nearer than 5/8" to the edge of the stud. Refer to UPC 313.9 and IBC 2308.9.10 and 2308.9.11.
- F. All pipes shall be run with proper grade to provide for easy draining and in group runs where applicable and in a neat and orderly manner, to the satisfaction of Architect/Engineer. Lines required to be enclosed in ceiling, chase ways or spaces shall

be installed to permit such enclosure as intended. All pipe runs shall be carefully laid out and scheduled to avoid unnecessary interferences with other work.

- G. Minimum grade for horizontal drainage piping shall be 1/4 inch per foot for 3 inch diameter piping or less, 1/8 inch per foot for 4 inch and larger piping. Install all roof drain piping at 1/8 inch per foot.
- H. The Engineer shall field inspect all underground piping prior to backfilling and compaction of trenches.
- I. Dielectric unions shall be installed at each piping joint between ferrous and non-ferrous piping and joints between dissimilar metals. Comply with manufacturer's installation instructions. Provide standard products recommended by manufacturer for use in service indicated, which effectively isolate piping (electric conductance), prevent galvanic action and stop corrosion. Provide Watts series 3000 or equal.
- J. At all fixture connections where nipples are necessary between copper tubing and fixtures, such nipples shall be standard weight full iron size chrome plated brass pipe nipples with suitable brass or copper adapters. Steel or iron nipples will not be permitted in any location in copper lines where connections are made to brass fixtures valves or trim.
- K. No Weld-O-Let Fittings shall be used.
- L. Concrete thrust blocks shall be installed at all elbows, tees and shut-off valves in the underground domestic water main piping. Threaded rod mechanical restraints anchored to the floor shall be installed at the water service termination inside the building. Thrust blocks and mechanical restraints shall be properly sized to meet the static and dynamic loads of the piping.
- M. All exposed gas piping inside and outside the building shall be painted gray.

3.2 UTILITY CONNECTIONS

- A. Domestic water system shall be installed in compliance with all requirements of the municipal utility. The minimum cover over piping shall be 6'-0" under finished grade. The water meter shall be supplied by the municipal utility. The Mechanical Contractor shall be responsible for the purchase of the water meter and all related charges. Contact the municipal utility for the fees.
- B. All underground gas piping from the utility gas line to the low pressure stub out after the gas meter shall be the responsibility of the gas utility. The gas meter and regulator shall be furnished by the utility company. The Mechanical Contractor shall be responsible for any fees for the installation of the gas piping and the gas meter. Contact the gas utility for these charges.

3.3 TESTS

- A. Piping shall be tested as outlined in Section 22 05 00.

END OF SECTION 22 11 10

SECTION 22 33 00 - DOMESTIC WATER HEATERS (DWH1)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install electric domestic water heaters as shown on the plans, listed in the schedule and specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods

1.2 SHOP DRAWINGS

- A. Submit shop drawings on the water heaters as listed in Section 22 05 00.
- B. Indicate capacities, recovery rates, KW and dimensional data.

1.3 STANDARDS

- A. Unit shall be Underwriters Laboratories' listed and stamped.

PART 2 - PRODUCTS

2.1 DOMESTIC WATER HEATERS (DWH1)

- A. Water heater shall be Rheem electric water heater. A.O. Smith, State, Bradford White and Ruud shall be accepted as equal. Tank shall be furnished with two high efficiency stainless steel elements and a magnesium anode rod rigidly supported. Tank shall have a working pressure rating of 150 psi. Water heater shall be completely factory assembled, including over temperature protector and electrical junction box. The thermostat shall be adjustable from 90°F to 180°F. Complete unit shall be insulated with a blanket of fiberglass. Water heater shall be covered by a six year limited warranty against tank corrosion and must be in compliance with both standby loss and thermal efficiency of ASHRAE Standard 90. Water heater shall be furnished with a properly sized, ASME approved temperature/pressure relief valve rated at 200°F and 100 psi. Water heater shall be of capacity and size shown on the drawings and described in the equipment schedule.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The water heater shall be installed on 4" concrete pad. The temperature/pressure relief valve shall be piped to floor drain. Install unit according to manufacturer's instructions.

END OF SECTION 22 33 00

SECTION 22 40 00 - PLUMBING FIXTURES AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

- A. The work involved in this specification and the accompanying drawings consists of performing all labor and furnishing of all materials, fixtures and equipment necessary to install complete sanitary sewer systems and potable hot and cold water systems, as described herein and/or shown on the drawings. This includes all piping, wiring and materials obviously necessary for complete systems though not specifically mentioned or shown.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 22 05 00 - Plumbing Common Requirements
 - 2. 22 05 10 - Basic Materials and Methods
 - 3. 22 11 10 - Pipes and Pipe Fittings

1.3 MANUFACTURERS AND SELECTION

- A. Water closets and lavatories shall be Kohler, American Standard, Gerber or Zurn.
- B. Manual faucets shall be Delta, Zurn, Moen or Chicago Faucet.
- C. Drainage specialties shall be Zurn, Wade, Mifab, Watts, Sioux Chief, Josam or J.R. Smith.
- D. Toilet seats shall be Bemis, Church, Comfort Seat or approved equal.
- E. Mop sinks and laundry tubs shall be Zurn, Mustee, Fiat or approved equal.
- F. All other fixtures shall be as shown on the plan or approved equal. Models, sizes and capacities shall be as listed on the plumbing schedule on the plans or equivalent from other approved manufacturer.

1.4 SHOP DRAWINGS

- A. Submit shop drawings on all plumbing fixtures and equipment including gas regulators. Each item shall be clearly labeled as designated on the plans. The drawings shall include unit dimensions and construction specifications. All features specified shall be clearly designated on the shop drawings. Include shop drawings for stops, traps, continuous wastes and p-traps.

1.5 STANDARDS

- A. All fixtures and faucets designated "Handicapped" shall comply with ANSI standard 117.1, buildings and facilities providing accessibility and usability for physically handicapped people.

- B. All fixtures and faucets required shall meet the standards of the Reduction of Lead in Drinking Water Act and SDWA Safe Water Drinking Act pertaining to potable water systems.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Vents Through Roof (VTR)

- 1. Vent stacks from sewer, soil, waste and drain pipes shall be extended at least 12 inches above the roof. The minimum size of any vent passing through roof shall be 4 inches.

B. Cleanouts (CO)

- 1. Brass screw cleanout plugs shall be furnished and installed at the bottom of all soil, waste and storm sewer stacks and at all points where shown on drawings, and where necessary to permit the entire drainage system to be rodded out easily. Cleanouts in pipes 3" and smaller shall be pipe size. Cleanouts in pipe 4" and larger shall be 4". Floor drains located in branch lines on grade shall have cleanouts adjacent to the drains.
- 2. Floor cleanouts shall be Zurn ZN-1400 cast iron universal cleanout with inside caulk ferrule, brass plug, adjustable housing and round nickel brass secured frame and scoriated tractor cover. The cover shall be provided to accept the floor covering in the location being installed, i.e., synthetic covering, composition tile, terrazzo, etc. Provide carpet markers where needed. All cleanouts installed in floors with waterproof membranes, shall be provided with clamping devices. Cleanouts installed above finished grade shall be installed with a seepage pan of 4 lb. sheet lead at least 3 feet square.
- 3. Wall cleanouts shall be Zurn ZN-1441 cleanout ferrule with brass plug and round stainless steel secured access cover.
- 4. Grade cleanouts shall be Zurn ZN-1400 cast iron universal cleanout with inside caulk ferrule, brass plug, adjustable housing and round nickel brass secured frame and scoriated tractor cover. Install flush with finish grade.

C. Floor Drains (FD)

- 1. Furnish and install floor drains where shown on the drawings and as specified. All floor drains installed in floors with waterproof membranes shall have flashing clamps.
- 2. Floor drains shall have a 5" diameter polished nickel bronze strainer having a minimum of six square inches free area and flashing clamps. Furnish and install a deep seal trap.

D. Domestic Water System Expansion Tank

- 1. Expansion tanks shall be Amtrol bladder type with sizes and capacities as listed on the schedule. The tank shall have a standard fill pressure of 50 psi. The tanks shall be rated for a maximum working pressure of 175 psig and a maximum

working temperature of 200°F. Tank shall have a heavy duty butyl, rubber bladder, polypropylene liner and steel shell. An air changing valve (standard tire valve) shall be provided. The tank surface shall be finished with enamel paint. Bell and Gossett, Armstrong and Taco shall be accepted as equal.

E. Lavatory Sink P-Trap Drain

1. P-trap drain and exposed supply pipes shall be insulated with fully molded, Truebro, Handi Lav-Guard model 102 insulation kit, white color. Insulation shall be self-extinguishing. Nylon type fasteners shall be furnished with kit.

F. Thermometers: Thermometers shall be Weiss No. A9VS35. Thermometers shall have 9 inch scale with separable, adjustable socket, red reading spirit with thermometer wells. Mercury will not be allowed. Scale range shall be 30-200 degrees F. Terice, Miljoco and U.S. Gauge shall be accepted as equal.

PART 3 - EXECUTION

3.1 SYSTEM OF PLUMBING

- A. The continuous waste and vent method of plumbing shall be installed. Hot, tempered and cold water pipes are to be installed where shown. All water piping in finished areas shall be concealed in joist spaces, above ceilings, and in walls.
- B. Pipes run overhead shall be placed as close to the ceiling as possible, to maintain proper headroom and to present a neat appearance, all consistent with the pitching of pipes for drainage of the systems.
- C. The plumbing work shall be installed in strict accordance with the best plumbing practice, and in accordance with all applicable local, state and national plumbing regulations.

3.2 WASTE, VENT AND WATER CONNECTIONS

- A. All exposed flush, waste and supply pipes at the fixtures shall be chrome-plated brass pipe, iron pipe size. No steel nipples will be allowed. The faucets, stop valves, pop-up wastes, traps, flush valves etc. shall be heavy cast brass chromium plated. Water lines to all individual fixtures, where exposed, shall be equipped with high grade, loose key, quarter-turn, chromium plated brass stop valves model KTSCR19C Brass Craft brass or equal. All chrome plate shall be installed over a nickel plated base. Provide backing at wall to support fixtures. All water closets shall have bolt caps with retainer clips. Groups of fixtures shall be matched. All fixtures which do not have integral traps shall be furnished with 17 gauge chromium plated brass p-traps with cleanouts.
- B. Waste, vent and water supply piping to plumbing fixtures which is not shown on the drawings shall be provided and shall be sized in accordance with the plumbing schedule on the plans. All plumbing fixtures, wastes, and drains shall be vented in accordance with all applicable Local, State and National Plumbing Regulations.
- C. Flush handles shall be mounted on the wide side of toilet areas on all handicapped water closets.

- D. Caulk plumbing fixtures to wall and floor. Caulk color to match fixture. Stainless steel sinks and electric water coolers to be caulked with clear caulk.

END OF SECTION 22 40 00

SECTION 23 05 00 - HVAC COMMON REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The plans and specifications contemplate the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many minute items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly herein, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. In receiving bids, it will be assumed that each bidder has made a thorough inspection of the conditions and is familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions prior to submitting the bid will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work specified herein. Attention is directed in particular to the UNIFORM PLUMBING CODE, INTERNATIONAL MECHANICAL CODE, INTERNATIONAL BUILDING CODE AND/OR ANY AUTHORITY HAVING JURISDICTION, and local regulations concerning the specified heating and cooling equipment.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Bidders shall familiarize themselves with local regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Architect/Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in

type, function, quality of material and assembly and meet the requirements indicated in drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Submit requests via email. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as acceptable equals for quotations and use, approval will be issued in an addendum.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for approval, prior to the placing of orders for any equipment, complete shop drawings of HVAC equipment and fixtures to be installed. The shop drawings shall include product specifications, cut sheets, diagrams, shop drawings, performance curves or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. The shop drawings shall list the operating conditions of the equipment at the conditions listed on the schedules. Provide shop drawings in electronic 'PDF' format suitable for use on Submittal Exchange or similar program.
- B. All shop drawings shall be submitted by the Contractor and shall have been signed, "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will check the shop drawings to aid in interpreting the plans and specifications, and in so doing will assume that the shop drawings conform to all specified requirements set forth in this specification. The approval of the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the specification.
- C. The determination of quantities of material and equipment required shall be made by the Contractor from the drawings. Schedules on the drawings and in the specification are completed as an aid to the Contractor, but where discrepancies arise, it shall not release the Contractor from providing the proper number to complete this work.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 ALL EQUIPMENT FURNISHED UNDER DIVISION 23

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.

- C. Run operating test for 30 hour periods and submit data for approval.
- D. All equipment shall be charged with clean media and installation completely finished prior to acceptance.

3.2 OPERATION AND MAINTENANCE MANUALS

- A. Prepare one portfolio with one complete set of shop drawings of the equipment used in the erection of the HVAC systems and equipment testing, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, and name and address of authorized service organization.
- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer. Provide manuals in electronic 'PDF' format in addition to the printed copies.
- C. The portfolio shall be submitted to the Engineer for review of material and completeness prior to final inspection, and when approved by the Engineer, the portfolio shall be turned over to the Owner.

3.3 PROJECT CLOSE OUT

- A. The Mechanical Contractor shall arrange for an inspection of all items installed in the ceiling before the ceiling or ceiling tile is installed. The Engineer shall be informed at least one week before the planned installation of the ceiling to arrange the inspection. If the ceiling tile is installed before the inspection, the Mechanical Contractor shall remove all the ceiling tiles prior to the inspection.
- B. General: Refer to Division 1 sections for general closeout requirements. Maintain a daily log of operational data on HVAC equipment and systems throughout the closeout period; record hours of operation, assigned personnel, fuel consumption and similar information; submit copy to Engineer.
- C. Record Drawings: Give special attention to the complete and accurate recording of underground conduit, piping and concealed and non-accessible work, branching arrangement and valve location of all piping systems, location of dampers and coils in duct systems, locations of control system sensors and other control devices, and work of change orders where not shown on contract documents.
- D. Closeout Equipment/Systems Operations: Sequence operations properly so that work of the project will not be damaged or endangered. Coordinate with seasonal requirements. Operate each item of equipment with the Owner's operating personnel present to demonstrate sustained, satisfactory performance. Adjust and correct operations as needed for proper operation. Clean and lubricate each system, and replace dirty filters, excessively worn parts and similar expendable parts of the system.
- E. Operating Instructions: Conduct at least a full day walkthrough instruction seminar for the Owner's personnel to be involved in the operation and maintenance of the HVAC equipment and systems. If more time is needed the Contractor shall continue instruction

until the Owner's personnel are familiar with the operation of the system. Explain the identification system, operational diagrams, emergency and alarm provisions, sequencing requirements, seasonal provisions, security, safety, efficiency and similar features of the system.

1. Provide written verification that operating instructions have been provided, signed off by an Owner's Representative.
- F. Turn-Over of Operation: At the time of substantial completion, turn over the prime responsibility for the operation of the system to the Owner's personnel. However until the time of final acceptance, provide at least one full-time operating technician, who is completely familiar with the work, to consult with and continue training the Owner's personnel. Additional training shall take place as specified in other sections.
- G. Final Completion: The following special requirements shall be provided in addition to those specified elsewhere:
1. The Contractor shall not call for final completion check until the HVAC systems and equipment have been installed, adjusted, balanced, and are in full and complete satisfactory operation.
 2. Exceptions may be permitted upon written request from the Contractor listing any minor items that are uncompleted and beyond his reasonable control. Provide a full guarantee that they be completed at a named later date and the guarantee shall be extended as required to provide a full warranty.
- H. Final Payment will not be made until the Contractor has satisfactorily completed all final inspection items.
- I. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. The Owner has the right to order repairs to any equipment or work provided hereon and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 23 05 00



Engineering Design Associates, Inc.

385 12th Street, NE
Sioux Center, Iowa 51250
712-722-0228
www.edaengineers.com

PROJECT: CENTRAL LYON CSD - BUS BARN & CABINET REPLACEMENT REDESIGN
EDA PROJECT #: 2249

To All Persons Requesting Files:

At your request, EDA Inc. will provide copies of its Building Information Model ("BIM") for the above-mentioned project.

It is expressly understood that the BIM files are being issued only as supplemental information for the convenience of the Contractor or Construction Manager.

Our electronic files are generated with Autodesk Revit software in the Revit release version utilized by the design team. EDA Inc. makes no representation as to the compatibility of these files with your hardware or your software.

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EDA Inc. will furnish your electronic files of the following drawings sheets:

List of Requested Drawings

Revit Version

\$100.00 Total Service Fee

The service fee as outlined above shall be remitted to EDA Inc. prior to delivery of the electronic files.

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(Company Name)

(Representative and Title)

(Representative Signature)

(Date)

(E-Mail Address)

2024 Facility Improvements
Central Lyon Community School District

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SECTION 23 05 10 - BASIC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All work done under Division 23 shall be in accordance with the requirements of this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following section shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements

1.3 SHOP DRAWINGS

- A. Submit shop drawings in accordance with Section 23 05 00.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 INSTALLATION OF THE WORK

- A. The Contractor shall examine all the drawings before proceeding with the layout and installation of his work. General, plumbing and electrical wiring contract drawings will be made available to this Contractor. SHOULD DISCREPANCIES AFFECTING THE WORK BE FOUND, THE CONTRACTOR SHALL IMMEDIATELY REPORT SAME TO THE ENGINEER FOR INSTRUCTIONS. Subsequent changes made necessary by the neglect of any Contractor to discover and report such discrepancies shall be made by and at the expense of the Contractor, under the direction of the Engineer.
- B. Furnish, provide, and/or install shall be considered as requiring the Contractor to both furnish the equipment and install it unless specific reference is made to the furnishing or installing of the equipment by others.
- C. The Contractor shall confer and cooperate with other Contractors on the job in the installation of his work so all work will be installed in proper relationship to the surrounding location and shape of any part to avoid conflicts. The Contractor shall be responsible for the correct size and location of any changes, slots, and openings required by him and shall be required to do, at his expense, any cutting or patching made necessary by his failure to make proper arrangements in this respect.
- D. Pipes and ducts shall be located essentially as shown on the drawings, but in exact locations as laid out by the Contractor on the job to suit actual conditions. Exposed pipes and ducts shall be arranged as closely as practical to wall or ceiling surfaces. Indicated connections to equipment are necessarily based on equipment of a given manufacturer. If the Contractor proposes to use "approved equal" equipment, then it shall be understood that the Contractor shall assume the responsibility for proper location in a

manner approved by the Engineer. Changes made necessary for this reason will be made by, and at the expense of this Contractor.

- E. The Contractor shall follow the equipment manufacturer's instructions and recommendations in the installation and connection of all equipment and materials furnished under this contract. In the event of conflict or discrepancy between manufacturer's instructions and the contract documents, the Contractor shall notify the Engineer before proceeding. No equipment installation shall be made in a manner that voids the manufacturer's warranty of the equipment.
- F. Any hazardous waste or asbestos required to be removed, encapsulated or otherwise contained during the course of this project shall be performed by the Owner. E.D.A. Inc. shall be indemnified from any and all liability associated with the removal, encapsulation or containment of hazardous waste or asbestos.

3.2 PROTECTION AND CLEANING OF HVAC SYSTEMS

- A. All duct and equipment shall be kept clean at all times, refer to specific specification sections for additional requirements. Air handling units, fan coil units, etc. shall be protected from weather, dust-producing procedures, or damage. Take immediate measures to dry any equipment that becomes wet. If any mold growth develops on equipment because Contractor did not protect or dry the equipment, Contractor shall remediate the equipment following procedures approved by MCPS.
- B. Duct systems, air-handling units, fan coil units, etc. shall be protected from construction dust and debris by sealing outlets and openings with 6-mil plastic sheeting. Stand-alone units (e.g., fan coil units) shall be wrapped with 6 mil plastic and sealed with tape.
- C. HVAC equipment shall not be operated during construction without Engineers approval. If HVAC equipment is operated in construction areas, filters having a minimum efficiency of 30% (atmospheric duct spot efficiency test) or MERV 6 rating shall be installed on return air openings. Filters shall be changed every two weeks at the General Contractors expense.
- D. If duct or equipment becomes dirty during construction, clean the duct following National Air Duct Cleaning Association (NADCA) procedures.
- E. Work shall comply with recommendations of the SMACNA IAQ Guidelines for Occupied Buildings Under Construction.

3.3 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. If installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated, suitable allowances shall be made by the equipment supplier and/or Contractor.

3.4 RECORD DRAWING

- A. The Architect will furnish the Contractor 1 set of the mechanical drawings as issued for this contract. The Contractor shall use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job the drawings shall be delivered to the Engineer for a permanent record of the exact location of all equipment, pipe runs, etc., as incorporated in the job.

3.5 CLEANING

- A. At the conclusion of construction work, the entire system of heating and cooling equipment shall be cleaned prior to acceptance of the building. The Contractor shall flush the entire system with clean water, opening all dirt pockets and strainers, completely blowing down as required and cleaning strainer screens of all accumulated debris, lint, etc. All tanks, fixtures and pumps shall be drained and proved free of sludge and accumulated matter. After the system has been flushed, it shall be refilled with clean water to which appropriate concentration of Kurita Boil Out 881 pre-clean has been added to remove pipe dope, fabrication lubricants, oils, loose mill scale and other extraneous materials. The system shall then be circulated for at least eight hours, then drained and flushed with clean water.
- B. Labels, stickers, etc., shall be removed and the entire installation left in a clean, usable condition.
- C. Heating and cooling equipment, tanks, heat exchangers, pumps, traps, duct, etc., shall be thoroughly cleaned and new filters or filter media installed.

3.6 PAINTING

- A. Finishes of all mechanical equipment shall be protected during storage, installation and until final acceptance. Any damage or imperfections shall be "touched up" or if extensive, the entire unit shall be repainted as directed by the Engineer.

3.7 SLEEVES

- A. The Mechanical Contractor shall set and maintain all sleeves. Any pipe passing through building construction including walls, floors, roofs or masonry partitions shall be encompassed with sleeves in accordance with the following. Slab-on-grade penetrations do not require sleeves unless noted otherwise.
- B. All pipe sleeves through slabs, floors, masonry walls and partitions shall be 1/2 inch greater in inside diameter than the external diameter of pipe passing through. Sleeves for insulated piping shall be large enough to accommodate the insulation without harming the insulation or vapor barrier. All sleeves shall be fabricated from new material cut square and reamed.
- C. Sleeves shall be schedule 40 steel pipe. Wall sleeves shall be flush with the wall surface. The top of floor sleeves shall extend 1" above the floor, the bottom of the sleeve shall be flush with the underside of the floor.

- D. The space between the pipe and the sleeves, through fire rated walls and floors shall be protected as designated in Section 23 05 11.
- E. Furnish and install chrome-plated wall, floor and ceiling plates on all exposed pipes where they pass through walls, floors, or ceilings in finished areas. The wall plates shall have set screws or spring locks for clamping to the pipe.
- F. All pipes through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the wall's sound rating.

3.8 OPENINGS

- A. All openings required for the passage of ductwork and HVAC equipment in the construction shall be provided by the General Contractor. The Mechanical Contractor shall be responsible for determining the correct location for all openings.
- B. The inside dimensions of all openings shall be 1/2 inch greater than the size of the ductwork or equipment passing through the opening. Openings for insulated ductwork shall be large enough to accommodate the insulation without harming the insulation or vapor barrier.
- C. All openings through fire rated walls and floors shall be protected as designated in Section 23 05 11.
- D. Provide a sheet metal trim angle for all exposed ducts where they pass through walls, floors or ceilings in finished areas. The trim angle shall completely cover the space between the duct and the wall, floor or ceiling.
- E. All ducts through sound rated walls or walls which run up to the deck above shall be sealed to prevent sound transmission and maintain the walls sound rating.

3.9 EXISTING SERVICES

- A. The Contractor shall verify the exact location of all existing building services extended and/or relocated for this project. The Contractor shall also verify the exact location and take proper precautions to protect all services which may be encountered during construction.
- B. All active services which are encountered shall be protected, braced and supported where required for proper execution of the work and without interruption of service if possible.
- C. All inactive services which are encountered shall be protected, or removed as directed by the Owner, Utility Company, or Municipal Agency having jurisdiction.
- D. When active services must be temporarily interrupted, arrangements shall be made to work continuously including overtime if required, to assure that services will be interrupted only as long as actually required to complete necessary work.

3.10 ACCESS TO EQUIPMENT

- A. Access shall be provided to all motors, valves, dampers, controls, specialties, etc., for maintenance purposes. All access doors, access panels, removable sections, etc., required for access shall be provided. The General Contractor will provide access panels and doors required in the building construction where shown on the plans. The location of the access openings relative to the HVAC equipment shall be coordinated to assure proper access to the equipment.
- B. All access openings required for manual, motorized, fire and smoke dampers and other devices requiring access shall be provided in the ductwork, plenums, housings, tanks, etc., under this portion of the contract.

3.11 PROTECTIVE DEVICES

- A. All sheaves, belts, drives, couplings, and moving parts shall be protected by OSHA approved permanent guards, shields, or railings, which shall be in place whenever the equipment is in operation and shall be in accordance with applicable safety standards.

END OF SECTION 23 05 10

SECTION 23 05 11 - HVAC FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Through-penetration firestopping in fire rated construction.
 - 2. Through-penetration smoke stopping in smoke partitions.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods

1.3 REFERENCES

- A. Underwriters Laboratories
 - 1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XCHR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
 - 1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.4 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.

- F. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.5 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption and at other construction gaps.
 - 2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and type of construction and at all separations required to permit building movement and sound or vibration absorption and at other construction gaps.

1.6 SUBMITTALS

- A. Submit in accordance with Section 23 05 00, unless otherwise indicated.
- B. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures, plus the following specific requirements.
 - 1. Details of each proposed assembly identifying intended products and applicable UL system number or UL classified devices.
 - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgments and drawings relating to non-standard applications.

1.7 QUALITY ASSURANCE

- A. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers or UL classified devices.
- B. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.8 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping:
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.

2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.9 PROJECT CONDITIONS

- A. Existing Conditions:
1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
 2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.
- B. Environmental Requirements:
1. Furnish adequate ventilation if using solvent.
 2. Furnish forced air ventilation during installation if required by manufacturer.
 3. Keep flammable materials away from sparks or flame.
 4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

PART 2 - PRODUCTS

2.1 THROUGH-PENETRATION FIRESTOPPING AND FIRE-RATED CONSTRUCTION

- A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free.
1. Additional Requirements: Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
 2. Acceptable Manufacturers and Products:
 - a. Manufacturer shall be 3M, Hilti or S.T.I.
 - b. Products shall be listed in the UL Fire Resistance Directory for the UL system.
 3. All firestopping products must be from a single manufacturer.

2.2 SMOKE STOPPING AT SMOKE PARTITIONS

- A. Through-Penetration Smoke-Stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.3 ACCESSORIES

- A. Fill, Void or Cavity Materials: As classified under category XHHW in the UL Fire Resistance Directory.
- B. Forming Materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where rated walls are constructed with horizontally continuous air space, double width masonry or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.
- F. Install smoke stopping as specified for firestopping.

3.4 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 23 05 11

SECTION 23 05 13 - ELECTRICAL PROVISIONS OF HVAC WORK

PART 1 - GENERAL

1.1 ELECTRIC MOTORS

- A. All electric motor driven equipment being furnished and installed under these specifications shall be complete with electric motors, unless specified otherwise. Bearings shall be ball type with lubricating fittings extended to an easily accessible location for field servicing. Minimum service factors for all motors shall be 1.15. All motors shall conform to applicable NEMA Standards, and shall bear the stamp of approval of the Underwriters Laboratories. All motors, except direct connected motors, shall be furnished complete with cast iron or stamped steel adjustable slide rails. Single phase motors shall be capacitor start type, open drip proof, unless specified otherwise.
- B. Horsepower Rating: All electric motors shall be sized to meet the horsepower requirements of the driven unit at design characteristics including all V-belt and/or drive and coupling losses which are incurred without loading the motor beyond its nameplate horsepower rating. Where V-belt drives are employed, the motor horsepower nameplate rating shall not be less than 120 percent of the driven unit brake horsepower requirements.
- C. Single Phase Motors: Unless specifically noted otherwise, all electric motors shall be designed for operation in an ambient temperature not exceeding 40 degrees C., continuous duty and shall be designed for use with voltage as scheduled on drawings or specified, 60 cycle alternating current. Motors shall be thermally protected.

1.2 MOTOR STARTERS

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all motor starters will be furnished and installed by the Electrical Contractor.

1.3 ELECTRICAL WIRING

- A. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications, all electric wiring shall be furnished and installed by the Electrical Contractor. The Electrical Contractor will make one power connection to each item of HVAC equipment, unless specified otherwise.
- B. Except where specifically described as being furnished as a part of the equipment furnished and installed under these specifications all disconnects shall be furnished and installed by the Electrical Contractor.
- C. All control wiring and controls as noted on the drawings and/or as specified in these specifications shall be furnished and installed by this Contractor, unless specifically noted otherwise.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Verify proper motor rotation at equipment startup.

END OF SECTION 23 05 13

SECTION 23 05 53 - HVAC IDENTIFICATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All piping and HVAC equipment shall be identified as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00. The shop drawings shall indicate the materials used, colors and lettering for all piping and equipment labels. Furnish a complete list of equipment labels to be furnished for the project.

1.4 STANDARDS

- A. Comply with ANSI A13.1 for lettering size, length of color field and viewing angles of identification devices.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturer shall be Allen Systems, Brimar, Kolbi, Industrial Safety Supply, Seton Name Plate or W. H. Brady.

2.2 EQUIPMENT LABELS

- A. Engraved plastic laminate signs shall be constructed of engraving stock melamine plastic laminate, complying with Fed. Spec. L-P-3387 in the sizes and thicknesses indicated, engraved with the engraver's standard letter style of the sizes and wording indicated, punched for mechanical fastening except where adhesive mounting is necessary because of substrate. Engraving shall expose a contrasting inner layer. The thickness shall be 1/16" for units up to 8" max. dimension 1/8" for larger units. Fasteners shall be self-tapping stainless steel screws, except contact-type permanent adhesive where screws cannot or should not penetrate the substrate.
- B. Plastic equipment markers shall be manufacturer's standard laminated plastic, color coded equipment markers. Conform to the following color code.
 - 1. Green: Cooling equipment and components
 - 2. Yellow: Heating equipment and components
 - 3. Yellow/Green: Common heating and cooling equipment components
 - 4. Blue: Equipment which does not meet any of the above criteria.

5. For hazardous equipment use colors and designs recommended by ANSI 13.1.
- C. The nomenclature shall match the terminology on the schedules as closely as possible and shall include the following:
1. Name and plan number
 2. Equipment service
 3. Design capacity
 4. Other design parameters such as pressure drop, entering and leaving conditions, rpm, etc.
- D. Markers shall be approximately 2-1/2" x 4" for control devices, dampers and valves; and 4-1/2" by 6" for equipment. Letters for fire and smoke damper labels shall be at least 1/2" high.
- E. Lettering and Graphics shall coordinate names, abbreviations and other designations used in HVAC identification work, with corresponding designations shown specified or scheduled. Provide numbers, lettering and wording as indicated or, if not otherwise indicated, as recommended by manufacturers or as required for proper identification and operation/maintenance of HVAC systems and equipment. Where multiple systems of the same generic name are shown and specified provide individual system number as well as service.

PART 3 - EXECUTION

3.1 COORDINATION

- A. Where identification is to be applied to surfaces requiring insulation, painting or other covering; the identification shall be installed after completion of the painting and insulating.
- B. Any identification referencing a room name or number shall not use the room name and number listed on the project drawings as these names and numbers are for reference only. The Architect, Owner and Contractors shall coordinate all room names and numbers to be used on any identification.

3.2 INSTALLATION

- A. HVAC equipment identification shall be provided on or near each major item of HVAC equipment as herein specified. Signs shall be engraved plastic laminate. Signs shall be provided for the following general categories:
1. Main control and operating valves including safety devices.
 2. Meters, gauges and thermometers.
 3. Radiant Tube Heaters
 4. Power Roof Ventilators

END OF SECTION 23 05 53

SECTION 23 05 93 - TESTING, ADJUSTING, AND BALANCING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes testing, adjusting, and balancing HVAC systems to produce design objectives, including the following:
1. Balancing airflow within distribution systems, including submains, branches, and terminals, to indicated quantities according to specified tolerances.
 2. Adjusting total HVAC systems to provide indicated quantities.
 3. Measuring electrical performance of HVAC equipment.
 4. Setting quantitative performance of HVAC equipment.
 5. Verifying that automatic control devices are functioning properly.
 6. Reporting results of the activities and procedures specified in this Section.
- B. In addition to the requirements shown on the drawings, in this section and in Section 23 09 00, the following systems and equipment shall be included in the scope of this section:
1. Ceiling exhaust fan.
 2. Constant volume power roof ventilators.
- C. Related Sections include the following:
1. Testing and adjusting requirements unique to particular systems and equipment are included in the Sections that specify those systems and equipment.
 2. Field quality-control testing to verify workmanship quality for system and equipment installation is specified in system and equipment Sections.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
1. 23 05 00 - HVAC Common Requirements
 2. 23 05 10 - Basic Materials and Methods

1.3 DEFINITIONS

- A. Adjust: To regulate fluid flow rate and air patterns at the terminal equipment, such as to reduce fan speed or adjust a damper.
- B. Balance: To proportion flows within the distribution system, including submains, branches, and terminals, according to design quantities.
- C. Draft: A current of air, when referring to localized effect caused by one or more factors of high air velocity, low ambient temperature, or direction of airflow, whereby more heat is withdrawn from a person's skin than is normally dissipated.
- D. Procedure: An approach to and execution of a sequence of work operations to yield repeatable results.

- E. Report Forms: Test data sheets for recording test data in logical order.
- F. System Effect: A phenomenon that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
- G. System Effect Factors: Allowances used to calculate a reduction of the performance ratings of a fan when installed under conditions different from those presented when the fan was performance tested.
- H. Terminal: A point where the controlled medium, such as fluid or energy, enters or leaves the distribution system.
- I. Test: A procedure to determine quantitative performance of a system or equipment.
- J. Testing, Adjusting, and Balancing Agent: The entity responsible for performing and reporting the testing, adjusting, and balancing procedures.
- K. AABC: Associated Air Balance Council.
- L. AMCA: Air Movement and Control Association.
- M. NEBB: National Environmental Balancing Bureau.
- N. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.4 SUBMITTALS

- A. Quality-Assurance Submittals: Within 30 days from the Contractor's Notice to Proceed, submit 2 copies of evidence that the testing, adjusting, and balancing Agent and this Project's testing, adjusting, and balancing team members meet the qualifications specified in the "Quality Assurance" Article below.
- B. Contract Documents Examination Report: Within 45 days from the Contractor's Notice to Proceed, submit 2 copies of the Contract Documents review report as specified in Part 3 of this Section.
- C. Strategies and Procedures Plan: Within 60 days from the Contractor's Notice to Proceed, submit 2 copies of the testing, adjusting, and balancing strategies and step-by-step procedures as specified in Part 3 "Preparation" Article below. Include a complete set of report forms intended for use on this Project.
- D. Certified Testing, Adjusting, and Balancing Reports: Submit 2 copies of reports prepared, as specified in this Section, on approved forms certified by the testing, adjusting, and balancing Agent.
- E. Warranty: Submit 2 copies of special warranty specified in the "Warranty" Article below.

1.5 QUALITY ASSURANCE

- A. Agent Qualifications: Engage a testing, adjusting, and balancing agent certified by either AABC or NEBB. The agency shall be one of the following:
 - 1. TAB Systems, Sioux Falls, South Dakota.
 - 2. Balancing Professionals, Sioux Falls, South Dakota.
 - 3. Systems Management and Balancing, Waukee, Iowa.
 - 4. Precision Test and Balance, Waukee, Iowa.
- B. Certification of Testing, Adjusting, and Balancing Reports: Certify the testing, adjusting, and balancing field data reports. This certification includes the following:
 - 1. Review field data reports to validate accuracy of data and to prepare certified testing, adjusting, and balancing reports.
 - 2. Certify that the testing, adjusting, and balancing team complied with the approved testing, adjusting, and balancing plan and the procedures specified and referenced in this Specification.
- C. Testing, Adjusting, and Balancing Reports: Use standard forms from AABC's "National Standards for Testing, Adjusting, and Balancing" or standard forms from NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems."
- D. Instrumentation Type, Quantity, and Accuracy: As described in AABC national standards or as described in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems," Section II, "Required Instrumentation for NEBB Certification."
- E. Instrumentation Calibration: Calibrate instruments at least every 6 months or more frequently if required by the instrument manufacturer.

1.6 PROJECT CONDITIONS

- A. Partial Owner Occupancy: The Owner may occupy completed areas of the building before completion of testing, adjusting and balancing. Cooperate with the Owner during testing, adjusting, and balancing operations to minimize conflicts with the Owner's operations.

1.7 COORDINATION

- A. Coordinate the efforts of factory-authorized service representatives for systems and equipment, HVAC controls installers, and other mechanics to operate HVAC systems and equipment to support and assist testing, adjusting, and balancing activities.
- B. Notice: Provide 7 days' advance notice for each test. Include scheduled test dates and times.
- C. Perform testing, adjusting, and balancing after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.8 WARRANTY

- A. General Warranty: The national project performance guarantee specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Performance Guarantee: Provide a guarantee on AABC'S "National Standards" forms stating that AABC will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Or provide a guarantee on NEBB forms stating that NEBB will assist in completing the requirements of the Contract Documents if the testing, adjusting, and balancing Agent fails to comply with the Contract Documents. Guarantee includes the following provisions:
 - 1. The certified Agent has tested and balanced systems according to the Contract Documents.
 - 2. Systems are balanced to optimum performance capabilities within design and installation limits.

PART 2 - (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine Contract Documents to become familiar with project requirements and to discover conditions in systems' designs that may preclude proper testing, adjusting, and balancing of systems and equipment.
 - 1. Contract Documents are defined in the General and Supplementary Conditions of the Contract.
- B. Examine approved submittal data of HVAC systems and equipment.
- C. Examine project record documents described in Division 1 Section "Project Record Documents."
- D. Examine Architect's and Engineer's design data, including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- E. Examine equipment performance data, including fan curves. Relate performance data to project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system. Calculate system effect factors to reduce the performance ratings of HVAC equipment when installed under conditions different from those presented when the equipment was performance tested at the factory. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," Sections 7

through 10; or in SMACNA's "HVAC Systems--Duct Design," Sections 5 and 6. Compare this data with the design data and installed conditions.

- F. Examine system and equipment installations to verify that they are complete and that testing, cleaning, adjusting, and commissioning specified in individual Specification Sections have been performed.
- G. Examine system and equipment test reports.
- H. Examine systems for functional deficiencies that cannot be corrected by adjusting and balancing.
- I. Examine air-handling equipment to ensure clean filters have been installed, bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- J. Examine equipment for installation and for properly operating safety interlocks and controls.
- K. Examine automatic temperature control system components to verify the following:
 - 1. Dampers and other controlled devices operate by the intended controller.
 - 2. Dampers are in the position indicated by the controller.
 - 3. Integrity of dampers for free and full operation and for tightness of fully closed and fully open positions.
 - 4. Thermostats and humidistats are located to avoid adverse effects of sunlight, drafts, and cold walls.
 - 5. Sensors are located to sense only the intended conditions.
 - 6. Sequence of operation for control modes is according to the Contract Documents.
 - 7. Interlocked systems are operating.
- L. Report deficiencies discovered before and during performance of testing, adjusting, and balancing procedures.

3.2 PREPARATION

- A. Prepare a testing, adjusting, and balancing plan that includes strategies and step-by-step procedures.
- B. Complete system readiness checks and prepare system readiness reports. Verify the following:
 - 1. Permanent electrical power wiring is complete.
 - 2. Automatic temperature-control systems are operational.
 - 3. Equipment and duct access doors are securely closed.
 - 4. Balance, smoke, and fire dampers are open.
 - 5. Isolating and balancing valves are open and control valves are operational.
 - 6. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
 - 7. Windows and doors can be closed so design conditions for system operations can be met.

3.3 GENERAL TESTING AND BALANCING PROCEDURES

- A. Perform testing and balancing procedures on each system according to the procedures contained in this section and AABC national standards or in NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and this Section.
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary to allow adequate performance of procedures. After testing and balancing, close probe holes and patch insulation with new materials identical to those removed. Restore vapor barrier and finish according to the insulation Specifications for this Project.
- C. Mark equipment settings with paint or other suitable, permanent identification material, including damper-control positions, valve indicators, fan-speed-control levers, and similar controls and devices, to show final settings.

3.4 FUNDAMENTAL AIR SYSTEMS' BALANCING PROCEDURES

- A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.
- B. Determine the best locations in main and branch ducts for accurate duct airflow measurements.
- C. Measure duct airflow in ducts using the log - Tchebycheff Rule as outlined in ASHRAE Standard 111.
- D. Check the airflow patterns from the outside-air louvers and dampers and the return- and exhaust-air dampers, through the supply-fan discharge and mixing dampers.
- E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.
- F. Verify that motor starters are equipped with properly sized thermal protection.
- G. Check dampers for proper position to achieve desired airflow path.
- H. Check for airflow blockages.
- I. Check condensate drains for proper connections and functioning.
- J. Check for proper sealing of air-handling unit components.

3.5 CONSTANT-VOLUME AIR SYSTEMS' BALANCING PROCEDURES

- A. The procedures in this Article apply to constant-volume supply and exhaust-air systems.

- B. Adjust fans to deliver total design airflows within the maximum allowable rpm listed by the fan manufacturer.
1. Measure fan static pressures to determine actual static pressure as follows:
 - a. Measure outlet static pressure as far downstream from the fan as practicable and upstream from restrictions in ducts such as elbows and transitions.
 - b. Measure static pressure directly at the fan outlet or through the flexible connection.
 - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from flexible connection and downstream from duct restrictions.
 - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
 2. Measure static pressure across each air-handling unit component.
 - a. Simulate dirty filter operation and record the point at which maintenance personnel must change filters.
 3. Measure static pressures entering and leaving other devices such as sound traps, heat recovery equipment, and air washers under final balanced conditions.
 4. Compare design data with installed conditions to determine variations in design static pressures versus actual static pressures. Compare actual system effect factors with calculated system effect factors to identify where variations occur. Recommend corrective action to align design and actual conditions.
 5. Adjust fan speed higher or lower than design with the approval of the Engineer. Make required adjustments to pulley sizes, motor sizes, and electrical connections to accommodate fan-speed changes.
 6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure no overload will occur. Measure amperage in full cooling, full heating, and economizer modes to determine the maximum required brake horsepower.
- C. Measure terminal outlets and inlets without making adjustments.
1. Measure terminal outlets using a direct-reading hood or the outlet manufacturer's written instructions and calculating factors.
- D. Adjust terminal outlets and inlets for each space to design airflows within specified tolerances of design values. Make adjustments using volume dampers rather than extractors and the dampers at the air terminals.
1. Adjust each outlet in the same room or space to within specified tolerances of design quantities without generating noise levels above the limitations prescribed by the Contract Documents.
 2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 MOTORS

- A. Motors: Test at final balanced conditions and record the following data:
 - 1. Manufacturer, model, and serial numbers.
 - 2. Motor horsepower rating.
 - 3. Motor rpm.
 - 4. Efficiency rating if high-efficiency motor.
 - 5. Nameplate and measured voltage, each phase.
 - 6. Nameplate and measured amperage, each phase.
 - 7. Starter thermal-protection-element rating.

3.7 TEMPERATURE TESTING

- A. During testing, adjusting, and balancing, report need for adjustment in temperature regulation within the automatic temperature-control system.
- B. Measure outside-air, wet- and dry-bulb temperatures.

3.8 TEMPERATURE-CONTROL VERIFICATION

- A. Verify that controllers are calibrated and commissioned.
- B. Check transmitter and controller locations and note conditions that would adversely affect control functions.
- C. Record controller settings and note variances between set points and actual measurements.
- D. Verify operation of limiting controllers (i.e., high- and low-temperature controllers).
- E. Verify free travel and proper operation of control devices such as damper and valve operators.
- F. Verify sequence of operation of control devices. Note air pressures and device positions and correlate with airflow and water-flow measurements. Note the speed of response to input changes.
- G. Confirm interaction of electrically operated switch transducers.
- H. Confirm interaction of interlock and lockout systems.
- I. Record voltages of power supply and controller output. Determine if the system operates on a grounded or non-grounded power supply.
- J. Note operation of electric actuators using spring return for proper fail-safe operations.

3.9 TOLERANCES

- A. Set HVAC system airflow and water flow rates within the following tolerances:
 - 1. Supply, Return, and Exhaust Fans: Plus 5 to plus 10 percent.
 - 2. Air Outlets and Inlets: Plus 5 to minus 10 percent.

3.10 REPORTING

- A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article above, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.
- B. Status Reports: As Work progresses, prepare reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.11 FINAL REPORT

- A. General: Typewritten, or computer printout in letter-quality font, on standard bond paper, in 3-ring binder, tabulated and divided into sections by tested and balanced systems.
- B. Include a certification sheet in front of binder signed and sealed by the certified testing and balancing engineer.
 - 1. Include a list of the instruments used for procedures, along with proof of calibration.
- C. Final Report Contents: In addition to the certified field report data, include the following:
 - 1. Pump curves.
 - 2. Fan curves.
 - 3. Manufacturers' test data.
 - 4. Field test reports prepared by system and equipment installers.
 - 5. Other information relative to equipment performance, but do not include approved Shop Drawings and Product Data.
- D. General Report Data: In addition to the form titles and entries, include the following data in the final report, as applicable:
 - 1. Title page.
 - 2. Name and address of testing, adjusting, and balancing Agent.
 - 3. Project name.
 - 4. Project location.
 - 5. Architect's name and address.
 - 6. Engineer's name and address.
 - 7. Contractor's name and address.

8. Report date.
 9. Signature of testing, adjusting, and balancing Agent who certifies the report.
 10. Summary of contents, including the following:
 - a. Design versus final performance.
 - b. Notable characteristics of systems.
 - c. Description of system operation sequence if it varies from the Contract Documents.
 11. Nomenclature sheets for each item of equipment.
 12. Data for terminal units, including manufacturer, type size, and fittings.
 13. Notes to explain why certain final data in the body of reports vary from design values.
 14. Test conditions for fans and pump performance forms, including the following:
 - a. Settings for outside-, return-, and exhaust-air dampers.
 - b. Conditions of filters.
 - c. Cooling coil, wet- and dry-bulb conditions.
 - d. Face and bypass damper settings at coils.
 - e. Fan drive settings, including settings and percentage of maximum pitch diameter.
 - f. Settings for supply-air, static-pressure controller.
 - g. Other system operating conditions that affect performance.
- E. Gas-Fired Heat Apparatus Test Reports: In addition to the manufacturer's factory startup equipment reports, include the following:
1. Unit Data: Include the following:
 - a. System identification.
 - b. Location.
 - c. Make and type.
 - d. Model number and unit size.
 - e. Manufacturer's serial number.
 - f. Fuel type in input data.
 - g. Output capacity in Btuh.
 - h. Ignition type.
 - i. Burner-control types.
 2. Test Data: Include design and actual values for the following:
 - a. Low-fire fuel input in Btuh.
 - b. High-fire fuel input in Btuh.
 - c. Manifold pressure in psig.
 - d. Heating value of fuel in Btuh.
- F. Fan Test Reports: For supply and exhaust fans, include the following:
1. Fan Data: Include the following:
 - a. System identification.

- b. Location.
 - c. Make and type.
 - d. Model number and size.
 - e. Manufacturer's serial number.
 - f. Arrangement and class.
 - g. Sheave make, size in inches, and bore.
 - h. Sheave dimensions, center-to-center and amount of adjustments in inches.
2. Motor Data: Include the following:
- a. Make and frame type and size.
 - b. Horsepower and rpm.
 - c. Volts, phase, and hertz.
 - d. Full-load amperage and service factor.
 - e. Sheave make, size in inches, and bore.
 - f. Sheave dimensions, center-to-center and amount of adjustments in inches.
 - g. Number of belts, make, and size.
3. Test Data: Include design and actual values for the following:
- a. Total airflow rate in cfm.
 - b. Total system static pressure in inches wg.
 - c. Fan rpm.
 - d. Discharge static pressure in inches wg.
 - e. Suction static pressure in inches wg.
 - f. VFD output in Hertz or ECM percent speed.
- G. Instrument Calibration Reports: For instrument calibration, include the following:
1. Report Data: Include the following:
- a. Instrument type and make.
 - b. Serial number.
 - c. Application.
 - d. Dates of use.
 - e. Dates of calibration.

3.12 ADDITIONAL TESTS

- A. Within 90 days of completing testing, adjusting, and balancing, perform additional testing and balancing to verify that balanced conditions are being maintained throughout and to correct unusual conditions.
- B. Seasonal Periods: If initial testing, adjusting, and balancing procedures were not performed during near-peak summer and winter conditions, perform additional inspections, testing, and adjusting during near-peak summer and winter conditions.

END OF SECTION 23 05 93

SECTION 23 07 03 - FIBERGLASS HVAC DUCT INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. All ductwork on the project shall be insulated as specified in this section.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 31 10 - Duct

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
 - 1. Provide product description, list of materials and thickness for each device and location.
 - 2. Submit a complete copy of the manufacturer's installation instructions.

1.4 QUALITY ASSURANCE

- A. All covering and insulation materials used on this project shall have the manufacturer's name on the container. All materials must be dry and in good condition.
- B. All materials shall have composite fire and smoke hazard ratings as tested by procedures ASTM 84, NFPA 255 and U.L. 723 not to exceed 25 flame spread and 50 smoke developed. All accessories shall have the same component ratings so that the complete installation meet these standards.
- C. Insulation shall be applied by qualified personnel skilled in this trade. Insulation shall not be installed until surfaces are clean, dry and free of dirt, dust, grease and other extraneous elements.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Insulation materials shall be as listed, or approved equal.

2.2 MATERIALS

- A. Rigid external duct insulation shall be Certainteed CB 300 rigid insulation board with Foil-skrim-kraft facing. Insulation shall be wrapped tightly on the duct with all joints butted. Adhere adhesive at 8" on center. Additionally secure insulation to the bottom of rectangular duct over 24" wide with mechanical joints. Cover all joints with Foil Reinforced Kraft tape. Install insulation in accordance with manufacturer's

recommendations. Knauf, Owens Corning and Johns Manville shall be accepted as equal.

- B. Flexible external duct insulation shall be Certainteed standard flexible duct wrap, 1 pound density, FSK facing, with a k-value of 0.26 at 75°F mean temperature. Insulation shall have a nominal thickness of 1-1/2" with an average installed thickness of 1-1/8". Knauf, Owens Corning and Johns Manville shall be accepted as equal.

PART 3 - EXECUTION

3.1 APPLICATION

- A. The following systems shall be insulated with 1-1/2" thick flexible external duct insulation:
 - 1. Round exhaust duct.
- B. The following systems shall be insulated with 2" thick rigid external duct insulation:
 - 1. Rectangular exhaust duct within 10 lineal feet of the building exterior.
 - 2. Drip pans and ducts through roof or side walls.

3.2 EXTERNAL RIGID DUCT INSULATION

- A. The insulation shall be attached tightly to the duct with all joints butted. The insulation shall be applied to the duct by impaling over welded pins or studs and securing with washers or clips. All joints shall be taped to insure a continuous vapor barrier. Rub pressure sensitive tapes with a nylon sealing tool to assure a positive bond. Apply only if temperature is between 35° and 100°F. Pins or studs shall be spaced a maximum of 16" on center. Pins shall be within 4" of the insulation edge. Cover all pins and studs with a matching vapor barrier patch. Coat all taped seams and patches with two 1/8 coats of an approved vapor barrier mastic such as Benjamin Foster 30-35.

3.3 EXTERNAL FLEXIBLE DUCT WRAP INSULATION

- A. Adhere insulation to duct with fire retardant adhesive. Insulation shall be butted with facing overlapped a minimum of 2". All joints shall be sealed and taped with FSK backed tape to maintain a complete vapor barrier. Complete installation shall be in accordance with the manufacturer's installation instructions.

END OF SECTION 23 07 03

SECTION 23 09 03 - GAS DETECTION SYSTEM (GS1 THROUGH GS3)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install gas detectors as shown on the plan.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work

1.3 QUALITY ASSURANCE

- A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilation Systems".
- B. Electrical Components, Devices and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction and marked for intended use.

1.4 CODES AND STANDARDS

- A. Components shall be new and in conformance with the following applicable standards for products specified:
 - 1. American Society for testing and materials, ASTM
 - 2. Institute of Electrical and Electronic Engineers, IEEE
 - 3. National Electrical Manufacturers Association, NEMA
 - 4. Underwriters Laboratory, UL (UL 916)
 - 5. FCC Regulation, Part 15, Section 156
 - 6. National Fire Protection Association, NFPA
 - 7. Local building codes

1.5 SUBMITTALS

- A. Submit shop drawings as indicated in Specification Section 23 05 00.
- B. Submit product data for all components and devices to be used in the project. The product data shall include agency listings, accuracy ratings, wiring diagrams, recommended sensor locations and performance data.

PART 2 - PRODUCTS

2.1 CARBON MONOXIDE AND DIESEL CONTROL SYSTEM

- A. General: Furnish, install and wire Macurco CX-12 fixed gas detector with carbon monoxide (CO) and nitrogen dioxide (NO₂) sensors. Acme, Brasch and

Honeywell/Vulcain shall be accepted as equal. The unit shall consist of a control panel with carbon monoxide (CO) and nitrogen dioxide (NO₂) sensors.

1. CO and NO₂ sensors shall be capable of operating within relative humidity ranges of 10-90% (non-condensing) and temperature ranges of 0°F to 125°F.
2. The CO sensor shall have a range of 0-200 PPM and a recommended coverage area of at least 5,000 square feet.
3. The NO₂ sensor shall have a range of 0-20 PPM and a recommended coverage area of at least 5,000 square feet.
4. Provide alarm levels to activate fans, dampers and alarms. Install the unit per the following parameters:
 - a. The CO low level alarm setting shall be 35 PPM and the high level alarm setting shall be 200 PPM.
 - b. The NO₂ low level alarm setting shall be 2.5 PPM and the high level alarm setting shall be 5 PPM.
 - c. The unit shall have a 5 amp SPDT relay contact to operate a fan on low level alarm and a 0.5 amp SPDT relay contact to signal an alarm on high level alarm.
 - d. Alarm settings shall be adjustable via push button and LED display, or touch screen interface.
5. Sensing element shall require no more than a yearly calibration. CO and NO₂ sensors shall have a 2 year warranty.
6. Furnish with amber horn and strobe to be mounted near the gas detector panel.
7. Furnish with weatherproof housing for wash bay sensor.
8. Entire system shall be UL or ETL Listed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The units shall be installed as shown on the plan and as recommended by the manufacturer.
- B. Sensors shall be installed at the locations recommended by the manufacturer.
- C. Mechanical Contractor shall be responsible for installation of sensors and horn/strobes. Power and control wiring shall be provided by the Electrical Contractor. Provide manufacturer's instructions to the Electrical Contractor.
- D. The Mechanical Contractor shall provide training for the Owner's designated personnel on the maintenance and operation of the gas detection system. Submit a sign-in sheet for the training to the Engineer as part of the project closeout documentation.

3.2 SEQUENCE OF OPERATION

- A. CO and Diesel (NO₂) Ventilation Systems: Gas Detection Systems (GS1 through GS3), Power Roof Ventilators (PRV1 through PRV3) and Combination Louvers (L1 through L7).

1. General: The Mechanical Contractor shall furnish and install CO and NO₂ detectors as specified in Section 3.1. Electrical Contractor shall furnish and install all wiring and contactors as required to operate the system. All controls for the CO and NO₂ system shall be hard wired.
2. Gas Detection System (GS1), Power Roof Ventilator (PRV1) and Combination Louvers (L1 through L3): Upon a detection of a high level operating level by sensor GS1, power roof ventilator PRV1 shall be started and combination louvers L1 through L3 shall be opened. Upon a detection of an alarm level operating level by any sensor, a visual and audible alarm shall be initiated. Provide a manual override to start power roof ventilator and open combination louvers.
3. Gas Detection System (GS2), Power Roof Ventilator (PRV2) and Combination Louvers (L4 and L5): Upon a detection of a high level operating level by sensor GS2, power roof ventilator PRV2 shall be started and combination louvers L4 and L5 shall be opened. Upon a detection of an alarm level operating level by any sensor, a visual and audible alarm shall be initiated. Provide a manual override to start power roof ventilator and open combination louvers. Override switch shall be waterproof or installed in waterproof enclosure.
4. Gas Detection System (GS3), Power Roof Ventilator (PRV3) and Combination Louvers (L6 and L7): Upon a detection of a high level operating level by sensor GS3, power roof ventilator PRV3 shall be started and combination louvers L6 and L7 shall be opened. Upon a detection of an alarm level operating level by any sensor, a visual and audible alarm shall be initiated. Provide a manual override to start power roof ventilator and open combination louver.

END OF SECTION 23 09 03

SECTION 23 31 10 - DUCT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Rigid and flexible duct.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 11 - HVAC Firestopping
 - 4. 23 07 03 - Fiberglass HVAC Duct Insulation
 - 5. 23 33 00 - Duct Accessories

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Submit shop drawings on all manufactured spiral duct, double wall rectangular metal duct and flexible fiberglass duct.
- C. Indicate on drawings duct construction, type and construction of fittings and metal gauges. Indicate velocity ratings, pressure ratings and UL listing for flexible duct.

1.4 QUALITY ASSURANCE

- A. All duct shall be constructed and installed in accordance with the latest HVAC Duct Construction Standards, published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. All duct materials and construction shall meet the requirements of NFPA 90A of the latest issue, and the International Mechanical Code of the latest issue.

PART 2 - PRODUCTS

2.1 LOW PRESSURE DUCT (Static pressure \leq 1" WG positive or negative)

- A. All duct shall be low pressure duct.
- B. Low pressure rectangular duct shall be G60 galvanized steel fabricated and erected in a workmanlike manner. Fabricate plenums, goosenecks and special fittings, as shown on the drawings, or as required. Where space permits, duct elbows shall be constructed with an inside radius equal to or greater than the duct width. Where space does not permit duct turns as described above, duct turn vanes shall be used.
 - 1. Duct shall be properly braced and reinforced with transverse joints and bracing. Ducts 18" in width and larger shall be cross braced.

2. The minimum metal gauges for above floor low pressure duct shall be as follows:
 - a. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Up to 12", Galvanized Sheet Steel Gauge Number 26
 - b. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 13" to 30", Galvanized Sheet Steel Gauge Number 24
 - c. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 31" to 54", Galvanized Sheet Steel Gauge Number 22
 - d. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 55" to 84", Galvanized Sheet Steel Gauge Number 20
 - e. Max. Dimension of Rect. Ducts or Dia. of Round Duct: Over 85", Galvanized Sheet Steel Gauge Number 18

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The contractor shall verify the exact location of ductwork to avoid interference with the work of other trades. Special care shall be taken to avoid interference with piping, conduit, light fixtures etc. Concealed duct shall be installed to allow the installation of the ceilings at the height shown on the plans.
- B. All low pressure duct shall be constructed and installed in accordance with the HVAC Duct Construction Standards, as published by SMACNA, for 1" W.G. static pressure positive or negative.
- C. The bottom 1" of all exhaust air duct shall be soldered or caulked water tight to prevent the leakage of any condensated water from the duct.
- D. All openings in the duct work which would allow debris to enter the duct shall be covered during construction. The entire ductwork system shall be cleaned of all dust and debris at the conclusion of the construction.
- E. All duct hangers shall be constructed and installed in accordance with the SMACNA HVAC Duct Construction Standards. Duct hangers shall not be attached to the floor or roof decks. Hangers shall be attached to the structural steel construction with joist or beam clamps.

END OF SECTION 23 31 10

SECTION 23 34 16 - EXHAUST FANS (EF1)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install as shown on the plans and listed in the schedules, exhaust fans.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00. Shop drawings shall include all performance data as listed on the schedule and complete unit specifications. All accessories to be provided shall be clearly designated.

1.4 STANDARDS

- A. Unit shall be Underwriters Laboratories listed and stamped.
- B. Unit shall bear the AMCA Sound and Air Performance seal.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Units shall be as manufactured by Greenheck. Loren Cook shall be accepted as equal.

2.2 CONSTRUCTION

- A. Fan wheels shall be true centrifugal type. Integral backdraft damper shall be chatterproof. Terminals shall be provided with cord, plug and receptacle inside the housing. Furnish exhaust fans with white finished grille.
- B. Exhaust fan shall be furnished with a 6" round wall cap.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The exhaust fans shall be installed as shown on the plans and in accordance with the manufacturer's instructions.
- B. Verify that the unit is operating properly after installation.

END OF SECTION 23 34 16

SECTION 23 34 23 - POWER ROOF VENTILATORS (PRV1 THROUGH PRV3)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install Power Roof Ventilators as shown on the plans and listed in the schedule.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Shop drawings shall include all performance data listed in the schedule.
- C. Include manufacturer's descriptive literature.

1.4 STANDARDS

- A. Unit shall be Underwriters Laboratories listed and stamped (UL-705).
- B. Unit shall bear the AMCA Sound and Air Performance seal.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Power roof ventilators shall be as manufactured by Greenheck with Loren Cook accepted as equal.

2.2 CONSTRUCTION (DIRECT DRIVE, DOWN-BLAST FAN)

- A. General Description
 - 1. Down-blast fan shall be for roof mounted applications.
 - 2. Each fan shall bear a permanently affixed manufacturer's engraved metal nameplate containing the model number and individual serial number.
- B. Wheel
 - 1. Constructed of aluminum.
 - 2. Non-overloading, backward inclined centrifugal type.
 - 3. Statically and dynamically balanced in accordance to AMCA Standard 204-05.

4. The wheel cone and fan inlet shall be matched and shall have precise running tolerances for maximum performance and operating efficiency.

C. Motors

1. Electronically Commutated Motor
 - a. Motor enclosures shall be open type.
 - b. Motor shall be a DC electronic commutation type motor (ECM) specifically designed for fan applications.
 - c. Motors shall be permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase.
 - d. Shall have internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor.
 - e. Motor shall be speed controllable down to 20% of full speed (80% turndown). Speed shall be controlled by a potentiometer dial mounted at the motor.
 - f. Motor shall be a minimum of 85% efficient at all speeds.

D. Housing

1. Motor cover, shroud, curb cap, and lower wind band shall be constructed of heavy gauge aluminum.
2. Shroud shall have an integral rolled bead for extra strength.
3. Shroud shall be drawn from a disc and direct air downward.
4. Lower wind band shall have a formed edge for added strength.
5. Motor cover shall be drawn from a disc.
6. All housing components shall have final thicknesses equal to or greater than preformed thickness.
7. Curb cap shall have pre-punched mounting holes to ensure correct attachment.
8. Shall have rigid internal support structure.
9. Shall be leak proof.

E. Housing Supports and Drive Frame

1. Drive frame assemblies shall be constructed of heavy gauge steel and mounted on vibration isolators.

F. Vibration Isolation

1. Shall be rubber isolators.
2. Shall be sized to match the weight of each fan.

G. Disconnect Switches

1. Shall be NEMA rated: 1.
2. Shall have positive electrical shut-off.
3. Shall be wired from fan motor to junction box installed within motor compartment.

H. Accessories

1. Bird Screen

- a. Material type shall be aluminum.
- b. Shall protect fan discharge.

2. Roof Curbs

- a. Shall be mounted onto roof with fan.
- b. Material shall be galvanized.
- c. Insulation thickness shall be 2 inches.
- d. Curb height shall be a minimum of 12”.

3. Curb Seal

- a. Shall be rubber seal between the fan and the roof curb.

4. Dampers

- a. Type shall be motorized.
- b. Shall prevent outside air from entering back into the building when fan is off.
- c. Shall be galvanized frames with pre-punched mounting holes.

5. Damper Actuators

- a. Damper actuators shall be manufactured by Belimo, Honeywell or Siemens.
- b. Common Requirements
 - 1) Actuators shall operate related damper(s) with sufficient reserve power to provide smooth modulating action or two-position action and proper speed of response at velocity and pressure conditions to which the damper is subjected.
 - 2) Actuators shall produce sufficient power and torque to close off against the maximum system pressures encountered. Actuators shall be sized to close off against the fan shutoff pressure as a minimum requirement.
 - 3) The total damper area operated by an actuator shall not exceed 80 percent of manufacturer's maximum area rating.
 - 4) Provide one actuator for each damper assembly where possible. Multiple actuators required to drive a single damper assembly shall operate in unison.
 - 5) Avoid the use of excessively oversized actuators which could overdrive and cause linkage failure when the damper blade has reached either its fully open or closed position.
 - 6) Provide jackshafts and shaft couplings in lieu of blade-to-blade linkages when driving axially aligned damper sections.
 - 7) Provide mounting hardware and linkages for connecting actuator to damper.

c. Electric Damper Actuator

- 1) Actuator shall be electric motor powered using 120 VAC, delivering torque required for continuous uniform movement of controlled device from limit to limit when operated at rated voltage. Motor shall function properly within a range of 85 to 120 percent of nameplate voltage.
- 2) Actuator Construction: Actuators shall be constructed of fiber or reinforced nylon gears with steel shaft, copper alloy or nylon bearings, and pressed steel enclosures.
- 3) Spring return actuators shall be switchable from fail open to fail closed in the field without replacement.
- 4) Two-position actuators shall be single direction, spring return type.
- 5) Provide with position indicator and graduated scale.
- 6) Provide actuator with spring return to fail to an end position. Internal spring return mechanism shall drive controlled device to an end position (open or close) on loss of power. Batteries, capacitors, and other non-mechanical forms of fail-safe operation are not acceptable.
- 7) Provide protection against overload throughout the entire operating range in both directions. Electronic overload, digital rotation sensing circuitry, mechanical end switches, or magnetic clutches are acceptable methods of protection.
- 8) Actuator shall be designed to be directly coupled to damper shaft without the need for connecting linkages. The fastening clamp shall be of a "V" bolt design with associated "V" shaped, toothed cradle attaching to the shaft. "V" clamp assembly shall be of sufficient size to be directly mounted to the damper shaft or jackshaft. Bolt and set screw method of attachment is not permitted. Linkages are permitted where space is unavailable to mount actuator directly to the damper shaft, where the actuator would be inaccessible if mounted directly to the damper shaft.
- 9) Actuator shall be suitable for the operating temperature range specified for the valve but not less than 120 deg F, and for humidity range of 5 to 95 percent relative humidity, non-condensing.
- 10) Enclosure shall be suitable for ambient conditions encountered by application.
- 11) Actuator shall operate valve from fully closed to fully open within 90 seconds, from fully open to fully closed within 90 seconds, and to failed position within 30 seconds. Select operating speed to be compatible with equipment and system operation.
- 12) Actuators shall be provided with a conduit fitting and a minimum three-foot electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.
- 13) Actuators shall be UL 873 Listed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The power roof ventilators shall be installed as shown on the plans and as specified herein. Roof curbs shall be installed as recommended by the roofing contractor and as

detailed on general construction and HVAC drawings. Provide blocking under the curb so the bottom of the curb can be mounted level with the top of the insulation.

- B. The units shall be installed in accordance with the manufacturer's recommendations.

END OF SECTION 23 34 23

SECTION 23 37 24 – LOUVERS (L1 THROUGH L7)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install louvers as shown on the plan and listed on the schedule.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Shop drawings shall include all performance data listed in the schedule. Include AMCA certified data on air pressure drop, water penetration and the free area at the actual design conditions.
- C. Include manufacturer's descriptive literature with the products used clearly designated.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Louvers shall be manufactured by Greenheck with American Warming, Arrow, Cesco, Ruskin, NCA and Pottorff accepted as equal.

2.2 CONSTRUCTION

- A. Louver shall be "combination drainable" type with a gutter drain in each blade and downspouts in jambs and mullions. Front stationary drainable blades and rear adjustable blades shall be completely contained within the frame. Louver components shall be factory assembled by the louver manufacturer. Damper blades shall be airfoil type with vinyl blade seals and compressible metal joint seals. Louver design shall incorporate structural supports required to withstand a wind load of 20 lbs. per square foot. Louvers shall be architectural style with continuous appearing stationary blades, intermediate support mullions shall not interrupt blade appearance when viewed from the outside of the louver. Louver shall be constructed of extruded 6063T5 aluminum. Louver performance data shall be certified by AMCA for air performance and water penetration. Louvers shall be selected so the free area velocity is significantly below the manufacturer's maximum recommended velocity.
- B. Louvers and accessories shall receive finish color coating of baked acrylic enamel following thorough cleaning and pretreatment of the metal. The dry film thickness shall be approximately 1.5 mils. Color shall be selected by architect from manufacturer's standard colors.

2.3 ACCESSORIES

- A. Furnish clip angles and extended sill with each louver.
- B. A bird screen shall be installed on the interior of the louver.
- C. Louver shall have flanged frame.
- D. Damper Actuators
 - 1. Damper actuators shall be manufactured by Belimo, Honeywell or Siemens.
 - 2. Common Requirements
 - a. Actuators shall operate related damper(s) with sufficient reserve power to provide smooth modulating action or two-position action and proper speed of response at velocity and pressure conditions to which the damper is subjected.
 - b. Actuators shall produce sufficient power and torque to close off against the maximum system pressures encountered. Actuators shall be sized to close off against the fan shutoff pressure as a minimum requirement.
 - c. The total damper area operated by an actuator shall not exceed 80 percent of manufacturer's maximum area rating.
 - d. Provide one actuator for each damper assembly where possible. Multiple actuators required to drive a single damper assembly shall operate in unison.
 - e. Avoid the use of excessively oversized actuators which could overdrive and cause linkage failure when the damper blade has reached either its fully open or closed position.
 - f. Provide jackshafts and shaft couplings in lieu of blade-to-blade linkages when driving axially aligned damper sections.
 - g. Provide mounting hardware and linkages for connecting actuator to damper.
 - 3. Electric Damper Actuator
 - a. Actuator shall be electric motor powered using 120 VAC, delivering torque required for continuous uniform movement of controlled device from limit to limit when operated at rated voltage. Motor shall function properly within a range of 85 to 120 percent of nameplate voltage.
 - b. Actuator Construction: Actuators shall be constructed of fiber or reinforced nylon gears with steel shaft, copper alloy or nylon bearings, and pressed steel enclosures.
 - c. Spring return actuators shall be switchable from fail open to fail closed in the field without replacement.
 - d. Two-position actuators shall be single direction, spring return type.
 - e. Provide with position indicator and graduated scale.
 - f. Provide actuator with spring return to fail to an end position. Internal spring return mechanism shall drive controlled device to an end position (open or close) on loss of power. Batteries, capacitors, and other non-mechanical forms of fail-safe operation are not acceptable.
 - g. Provide protection against overload throughout the entire operating range in both directions. Electronic overload, digital rotation sensing circuitry,

mechanical end switches, or magnetic clutches are acceptable methods of protection.

- h. Actuator shall be designed to be directly coupled to damper shaft without the need for connecting linkages. The fastening clamp shall be of a "V" bolt design with associated "V" shaped, toothed cradle attaching to the shaft. "V" clamp assembly shall be of sufficient size to be directly mounted to the damper shaft or jackshaft. Bolt and set screw method of attachment is not permitted. Linkages are permitted where space is unavailable to mount actuator directly to the damper shaft, where the actuator would be inaccessible if mounted directly to the damper shaft.
- i. Actuator shall be suitable for the operating temperature range specified for the valve but not less than 120 deg F, and for humidity range of 5 to 95 percent relative humidity, non-condensing.
- j. Enclosure shall be suitable for ambient conditions encountered by application.
- k. Actuator shall operate valve from fully closed to fully open within 90 seconds, from fully open to fully closed within 90 seconds, and to failed position within 30 seconds. Select operating speed to be compatible with equipment and system operation.
- l. Actuators shall be provided with a conduit fitting and a minimum three-foot electrical cable and shall be pre-wired to eliminate the necessity of opening the actuator housing to make electrical connections.
- m. Actuators shall be UL 873 Listed.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install louvers as shown on the plan and recommended by the manufacturer.
- B. Coordinate installation of louvers with the General Contractor.
- C. The complete installation shall be completed in a workmanlike manner to provide a water proof and airtight installation.

END OF SECTION 23 37 24

SECTION 23 51 11 - TYPE 'B' EXHAUST VENT

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install type 'B' exhaust vent system as shown on the plans and listed herein.
- B. The entire system, including accessories shall be from one manufacturer.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods

1.3 STANDARDS

- A. The exhaust system shall be laboratory tested and listed by Underwriters Laboratories.

1.4 SHOP DRAWINGS

- A. Submit Shop Drawings as indicated in Section 23 05 00.
- B. Drawings showing the actual layout and drawn to scale shall be provided by the manufacturer.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Exhaust piping system shall be Selkirk Metalbestos with Heat Fab accepted as equal.

2.2 CONSTRUCTION

- A. The double wall pipe shall have an inner gas carrying pipe of aluminum. The outer jacket shall be galvanized steel. The materials and construction of the modular sections and accessories shall be as specified in the terms of the products UL listing.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The exhaust system shall be installed according to the manufacturer's installation instructions. Install system as shown on the plans, including all accessories as shown and as needed to provide a complete system. Installation shall be completed in accordance with the products U.L. listing.
- B. The exhaust system shall be hung from the buildings structural components with approved hangers. Hangers shall have a minimum safety factor of 4.

END OF SECTION 23 51 11

SECTION 23 55 23 - GAS FIRED INFRARED HEATING SYSTEM (RTH1 THROUGH RTH4)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install a gas-fired infrared heating system as shown on the plans and listed in the schedule.
- B. The system shall be furnished with all components and controls as needed to provide a complete system.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work
 - 4. 23 51 11 - Type 'B' Exhaust Vent

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00.
- B. Shop drawings shall include all performance data listed in the schedule.
- C. Include manufacturer's descriptive material.

1.4 STANDARDS

- A. Total system shall be certified to ANSI Z83.20 or CSA for commercial and industrial installation in the United States.

1.5 WARRANTY

- A. Heaters shall have a 10 year parts warranty on the burner and 5 year parts warranty on the tubes.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Infrared heating system shall be Re-Verber-Ray as manufactured by Detroit Radiant Products Co. with Reznor, Schwank, Superior Radiant, Solaronics, Space Ray, Roberts Gordon and Advanced Radiant Systems accepted as equal.

2.2 CONSTRUCTION (RTH1 AND RTH2)

- A. Fuel Type: Burner shall be designed for natural gas.

- B. Gas Control: Operation shall include a defined input differential. Heater must be CSA Design Certified to operate at an input differential of at least 30% between the low and nominal rated input modes.
- C. Combustion chamber shall be 4 inch O.D. 16ga., aluminized steel, finished with a high emissivity rated, corrosion resistant, black coating with an emissivity level documented at .92 or higher.
- D. Emitter Tube: Shall be 4 inch O.D. 16ga. aluminized steel finished with a high emissivity rated, corrosion resistant, black coating with an emissivity level documented at .92 or higher.
- E. Burner Type: Unit shall be a positive pressure power burner with a combustion fan upstream of the burner and exhaust gases for component longevity, maximum combustion efficiency, and energy transfer.
- F. Fan Enclosure: Combustion fan shall be totally housed inside burner control box and not exposed.
- G. Burner: Stainless-steel venturi burner. The flame anchoring screen shall have a minimum temperature rating equivalent to 430 grade stainless steel.
- H. Tube Connections: The heater's combustion chamber and radiant emitter tube shall incorporate a 4 inch slip-fit, interlocking connection in which the upstream tube slides into the next tube and is held by a bolted clamp.
- I. Ignition System: Hot surface silicon carbide capable of temperatures achieving 2400°F. Igniter shall be readily accessible and serviceable without the use of tools.
- J. Reflectors: Shall be .025 polished aluminum with a multi-faceted design which includes reflector end caps. Reflector shall have a polished bright finish with clear visual reflection ability. Reflector shall have a minimum of 7 sheet metal bends in its fabrication to optimize downward radiation. Reflectors shall be rotatable from 0 to 45 degrees when required. The heater's reflector hanging system shall be designed to permit expansion while minimizing noise and/or rattles.
- K. Control Box: Heater's exterior control chassis shall be constructed of corrosion resistant enameled steel.
 - 1. The heater's top cover shall be constructed of ABS plastic material.
 - 2. Air intake: An air intake collar shall be supplied as part of the burner control assembly.
 - 3. The heater's control compartment shall be accessible without the use of tools and serviceable while heater is operating.
- L. Heaters shall be equipped with a sight glass allowing a visual inspection of igniter and burner operation from the floor.
- M. The heaters shall utilize a downstream turbulator baffle for maximum heat transfer.
- N. Heater shall be supplied with a stainless steel flexible gas connector.

O. Burner Safety Controls:

1. Heater controls shall include a safety differential pressure switch to monitor combustion air flow, as to provide complete burner shutdown due to insufficient combustion air or flue blockage.
2. The heater shall incorporate a self-diagnostic ignition module, and recycle the heater after an inadvertent shutdown.
3. The heater's control system shall be designed to shut off the gas flow to the main burner in the event either a gas supply or power supply interruption occurs.
4. The heater's blower motor shall be thermally protected and the motor's impeller shall be balanced.
5. Heater control assembly shall include three indicator lights that define the units operating input ranges. One indicator shall validate air flow. Two indicator lights shall indicate low and high firing stages.
6. The heater's air flow control system shall provide a 45 second pre-purge prior to initiating burner operation and a 90 second post-purge upon completion, effectively removing all products of combustion from heat exchanger and/or radiant tubes.
7. No condensation shall form as a result of combustion in the combustion chamber or radiant tubes while at operating temperatures.
8. Thermostat control shall be two-stage operating on 24 volts.

P. Venting shall be per manufacturer approval and specifications.

Q. Thermostat: Furnish from the following:

1. Thermostat: 2-stage, digital programmable wall-mounting type with 50 to 90 deg F operating range.
2. Control Transformer: Integrally mounted.

2.3 CONSTRUCTION (RTH3 AND RTH4)

- A. Fuel Type: Burner shall be designed for natural gas.
- B. Gas Control: Operation shall include a defined input differential. Heater must be CSA Design Certified to operate at an input differential of at least 30% between the low and nominal rated input modes.
- C. Combustion chamber shall be 4" O.D. 16ga. 409 series stainless steel, finished with a high emissivity rated, corrosion resistant, black coating.
- D. Emitter tube shall be 4" O.D. 16ga. 304 series stainless steel finished with a high emissivity rated, corrosion resistant, black coating.
- E. Burner Type: Unit shall be a positive pressure power burner with a combustion fan upstream of the burner and exhaust gases for component longevity, maximum combustion efficiency, and energy transfer.
- F. Fan Enclosure: Combustion fan shall be totally housed inside burner control box and not exposed.

- G. Burner: Stainless-steel venturi burner. The flame anchoring screen shall have a minimum temperature rating equivalent to 430 grade stainless steel.
- H. Tube Connections: The heater's combustion chamber and radiant emitter tube shall incorporate a 4 inch slip-fit, interlocking connection in which the upstream tube slides into the next tube and is held by a bolted clamp.
- I. Ignition System: Hot surface silicon carbide capable of temperatures achieving 2400°F. Igniter shall be readily accessible and serviceable without the use of tools.
- J. Reflectors: Shall be 304 series stainless steel with a multi-faceted design which includes reflector end caps. Reflector shall have a polished bright finish with clear visual reflection ability. Reflector shall have a minimum of 7 sheet metal bends in its fabrication to optimize downward radiation. Reflectors shall be rotatable from 0 to 45 degrees when required. The heater's reflector hanging system shall be designed to permit expansion while minimizing noise and/or rattles.
- K. Control Box: Heater's control housing shall be totally enclosed with a corrosion resistant 304 series stainless steel exterior with silicone sealant.
 - 1. Air intake: An air intake collar shall be supplied as part of the burner control assembly.
 - 2. The controls shall be easily serviceable by removing one (1) panel. The silicon carbide igniter shall be readily accessible and serviceable without the use of tools.
- L. Heaters shall be equipped with a sight glass allowing a visual inspection of igniter and burner operation from the floor.
- M. The heaters shall utilize a downstream turbulator baffle for maximum heat transfer.
- N. Heater shall be supplied with a PVC coated stainless steel flexible gas connector.
- O. Burner Safety Controls:
 - 1. Heater controls shall include a safety differential pressure switch to monitor combustion air flow, as to provide complete burner shutdown due to insufficient combustion air or flue blockage.
 - 2. The heater shall incorporate a self-diagnostic ignition module, and recycle the heater after an inadvertent shutdown.
 - 3. The heater's control system shall be designed to shut off the gas flow to the main burner in the event either a gas supply or power supply interruption occurs.
 - 4. The heater's blower motor shall be thermally protected and the motor's impeller shall be balanced.
 - 5. Heater control assembly shall include three indicator lights that define the units operating input ranges. One indicator shall validate air flow. Two indicator lights shall indicate low and high firing stages.
 - 6. The heater's air flow control system shall provide a 45 second pre-purge prior to initiating burner operation and a 90 second post-purge upon completion, effectively removing all products of combustion from heat exchanger and/or radiant tubes.
 - 7. No condensation shall form as a result of combustion in the combustion chamber or radiant tubes while at operating temperatures.

- 8. Thermostat control shall be two-stage operating on 24 volts.
- P. Venting shall be per manufacturer approval and specifications.
- Q. Thermostat: Furnish with the following:
 - 1. Thermostat: 2-stage, NEMA 4X wall-mounting type with 50 to 90 deg F operating range.
 - 2. Control Transformer: Integrally mounted.

2.4 ACCESSORIES

- A. Furnish with vertical venting kit as scheduled and manufacturer's standard vent cap.
- B. Furnish with warning plaque designed to be hung below the heater. Plaque shall indicate clearance to combustible warning.
- C. Furnish with "S" clips and chains for ceiling suspension.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The unit shall be installed as shown on the plans and in accordance with the manufacturer's instructions.
- B. Verify that system and controls are operating properly after start-up.

END OF SECTION 23 55 23

SECTION 23 55 33 - GAS FIRED UNIT HEATERS (GUH1 AND GUH2)

PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install unit heaters as shown on the plan and listed in the schedule.

1.2 RELATED DOCUMENTS

- A. Requirements of the following sections shall also apply to this section.
 - 1. 23 05 00 - HVAC Common Requirements
 - 2. 23 05 10 - Basic Materials and Methods
 - 3. 23 05 13 - Electrical Provisions of HVAC Work

1.3 SHOP DRAWINGS

- A. Submit shop drawings as indicated in Section 23 05 00. Shop drawings shall include all performance data listed on the schedule and complete unit specifications. The performance data shall be listed under design conditions.

1.4 STANDARDS

- A. Units shall be AGA certified.
- B. Units shall be ETL certified.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Unit heaters shall be as manufactured by Modine. Detroit Radiant and Reznor shall be accepted as equal.

2.2 CONSTRUCTION

- A. The venting shall be a power exhausted arrangement. The unit shall be tested to insure proper ignition when the unit is subjected to 40 mile per hour wind velocities. The unit shall also include a factory mounted differential pressure switch designed to prevent main burner ignition until positive venting has been proven.
- B. The unit heater casing shall be constructed of not less than 20 gauge aluminized steel with minimization of exposed fasteners.
- C. All exterior casing parts casing parts shall be cleaned of all oils and a phosphate coating applied prior to painting. All exterior casing parts shall be painted with a electrostatically applied baked-on polyester powder paint for corrosion resistance.
- D. The unit shall be furnished with horizontal air deflectors. The deflectors are adjustable to provide for horizontal directional airflow control (up or down).

- E. The heat exchanger shall be made of 18 gauge aluminized steel tubes and headers. The thermal efficiency of the unit shall be a minimum of 82% efficient for all air flow ranges. Each heat exchanger tube shall be individually and directly flame-fired. The heat exchanger tube shall be crimped to allow for thermal expansion and contraction. The flue collector box shall be made of 20 gauge aluminized steel.
- F. The heat exchanger seams and duct connections shall be certified to withstand 0.9" W.C. external static pressure without burner flame disturbance.
- G. The burner shall be in-shot type, directly firing each heat exchanger tube individually and designed for good lighting characteristics without noise of extinction for both natural and propane gas.
- H. The ignition controller shall be 100% shut-off with continuous retry.
- I. The solid state ignition system shall directly light the gas by means of a direct spark igniter each time the system is energized.
- J. The unit gas controls shall be provided with the following:
 - 1. Two-stage gas controls with a two-stage combination gas control, an ignition control, and a two-stage low voltage thermostat. The unit shall fire at 50% fire on low stage or 100% fire on high stage of the unit based on the call for heat from a room thermostat.
 - 2. An automatic reset high limit switch mounted in the air stream shall shut off the gas supply in the event of overheating.
 - 3. A time delay relay shall delay the start of the air mover to allow the heat exchanger a warm-up period after a call for heat. The time delay relay shall also continue the air mover operation after the thermostat has been satisfied to remove any residual heat in the heat exchanger.
- K. A low voltage terminal board shall be provided for direct wiring connection to an external thermostat.
- L. A single 115V to 24V step down transformer shall be provided for all unit controls.
- M. The motor wiring shall be in flexible metal conduit.
- N. The motor shall be controlled by a time delay relay.
- O. Fan motor type shall be single-speed, totally enclosed.
- P. The unit shall be equipped with tapped holes to accept 3/8-16 threaded rod for suspension.
- Q. Unit shall have 2 suspension points.
- R. The following field installed accessory control devices shall be provided with the unit:
 - 1. 2-stage gas controls.

2. Exhaust vent tees with drip leg, cleanout cap and vertical termination cap.
3. Wall mounted 2-stage thermostat.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. The units shall be installed as shown on the plan.
- B. Install units as recommended by the unit manufacturer.

END OF SECTION 23 55 33

SECTION 26 01 00 - ELECTRICAL COMMON REQUIREMENTS

PART 1 - GENERAL

1.1 GENERAL SUPPLEMENTARY AND OTHER CONDITIONS OF THE CONTRACT

- A. The general, supplementary and other Conditions of the Contract and the General Requirements (Division 1) are hereby made a part of this section.
- B. Note that the complete electrical installation for this project falls under specification divisions: Division 26, Division 27 and Division 28.
- C. The project shall be bid as one complete package with the final electrical construction bid containing all costs for Division 26, 27 and 28. This will result in one "electrical" contract.
- D. The general requirements shown here in this Division 26 section shall also apply to Division 27 and 28.
- E. Where M.C. or Mechanical Contractor is referenced in Division 26, 27 or 28 specifications or on the electrical drawings, it refers to the general trade. Coordinate in field with the proper HVAC, Plumbing or Fire Suppression Contractor based on the information in the specification or note.

1.2 INTENT OF PLANS AND SPECIFICATIONS

- A. The intent of the plans and specifications are for the complete installation of the system described so that at the conclusion of the construction, the systems will be turned over to the Owner complete and ready for safe, efficient operation. The plans and specifications cannot deal individually with the many incidental items which may be required by the nature of the systems. The Contractor shall be obliged to furnish and install all such items normally included on systems of this type, which while not mentioned directly in the drawings and specifications, are obviously essential to the installation and operation of the system and which are normally furnished on quality installations of this type.
- B. The Contractor shall make a thorough inspection of the conditions and be familiar with all conditions affecting the extent or cost of this work. Claims for extra payments as a result of failure to examine the conditions will not be allowed.

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all state and local codes and ordinances applying to the work indicated in the drawings and specifications.
- B. Make application for, obtain and pay for all required permits and certificates of inspection for the work.
- C. In the event of conflict between this specification and a governing code or ordinance, the higher standard shall govern. Contractors shall familiarize themselves with local

regulations which affect their work in any way. Extra payment will not be allowed for changes required by local regulations.

1.4 INSPECTION

- A. Regular inspections shall be requested of duly authorized inspectors as required by codes and ordinances.

1.5 SUBSTITUTING

- A. Proposals to the Engineer from the Contractor for substitution of material and equipment listed on the drawings and/or these specifications shall be submitted after the Engineer's approval has been obtained. For such proposals, materials and equipment will have to conform in type, function, quality of material and assembly and meet the requirements indicated in the drawings and specifications. REQUESTS FOR APPROVAL SHALL BE SUBMITTED TO THE ENGINEER AT LEAST 10 DAYS PRIOR TO THE BID DATE. Submit requests via email. Each request shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitute including drawings, cuts, performance and test data and any other information needed for an evaluation. A statement setting forth any changes in any other equipment or other work that incorporation of the substitute would require shall be included. The burden of proof of the merit of the proposed substitute is upon the proposer. If these proposed substitutions are considered as equivalents for quotations and use, approval will be issued in an addendum. Review of proposed submittals will only take place if approval has been obtained and "ample time" is remaining in the addendum phase of the project. The definition of "ample time" required is at the discretion of the registered Engineer.

1.6 SHOP DRAWINGS

- A. The Contractor shall submit to the Engineer for review, prior to the placing of orders for any particular equipment, at least six (6) sets of shop drawings of electrical equipment and fixtures to be installed. The shop drawings shall consist of catalog cuts, diagrams, performance data or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics. Provide shop drawings in electronic "pdf" form if web based or email submittal methods are used.
- B. The shop drawings shall be bound in a hole punched or spiral bound type folder. Provide cover sheet with job name, name of Contractor, supplier and manufacturer. The cover sheet shall have ample space for Contractor's stamp and Engineer's stamp. If shop drawings for the following systems are required by the plans and specifications, the shop drawings for these systems shall be bound separately in the following categories:
 - 1. Lighting
 - 2. Power Distribution/Devices/Misc. Electrical Equipment
 - 3. Fire Alarm
 - 4. Data/Voice Cabling and Infrastructure
 - 5. Electrical Fire Stopping
- C. All shop drawings submitted by the Contractor shall be signed "approved" and initialed by the Contractor prior to submittal to the Engineer. The Engineer will review the shop

drawings to aid in the Contractor's interpretation of the plans and specifications. In doing so, the Engineer will assume that the shop drawings submitted by the Contractor conform to all specified requirements set forth in the drawings and specifications. The review of the shop drawings by the Engineer does not relieve the Contractor of the responsibility of complying with all elements of the plans and specifications.

- D. In the event that a shop drawing submittal is signed "Resubmit" by the Engineer, the following shall occur:
 - 1. On items that received comment, new catalog cut sheets, diagrams, or performance data shall be provided for the materials in question. The additional information shall fully conform to all comments made by the reviewing Engineer.
 - 2. The entire shop drawing submittal for that category shall be resubmitted.
- E. The determination of quantities of material and equipment required shall be made by the Contractor from the plans, schedules and specifications.
- F. Allow ten (10) working days for Engineer review. Shop drawing submittals to follow the process outlined in Division 1.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 TESTS

- A. Perform tests as specified in other sections.

3.2 SPECIAL SYSTEMS AND EQUIPMENT FURNISHED UNDER DIVISION 26, 27 & 28

- A. At a time set by the Contractor and agreed to by the Owner, arrange to place equipment in operation and have available at that time, if required, representatives of the manufacturer of equipment to assist in starting equipment, to make necessary adjustments to equipment, and to prove satisfactory operation prior to turning facility over to the Owner.
- B. Where indicated in the specification, provide the services of a factory trained representative to instruct the Owner's authorized personnel in the operation, control, and maintenance of equipment. Contractor shall instruct Owner's personnel in the operation of all other equipment and systems.
- C. Provide the services of a factory trained representative to visit the site to provide functional testing of the lighting control devices and lighting control systems to certify that the control hardware and software is calibrated, adjusted, programmed and in proper working conditions. At a minimum the following shall be performed:
 - 1. Confirm the placement, sensitivity and time out adjustments for occupancy sensors installed per design and yield acceptable performance.
 - 2. Confirm that time switches and programmable schedule controls are programmed to turn the lights off as designed.

3. Instruct the Owner's authorized personnel in the operation, control and maintenance of the lighting control equipment. See Section 26 02 00.
 4. Provide a test report to the Owner and the Engineer certifying the lighting controls performed as designed and meet the conditions above. The report shall indicate settings by room/area and device that the device meets the design requirements. The report shall be submitted in both hardcopy and electronically (in pdf format) to the Owner and Engineer.
- D. Any irregularities, faulty equipment, etc., shall be repaired or replaced as required prior to acceptance.
- E. Any fuel source used in the testing of special systems shall be the responsibility of the Contractor.

3.3 OPERATION AND MAINTENANCE MANUALS

- A. Prepare two portfolios with two complete sets of shop drawings of the equipment used in the electrical systems, cleaning and maintenance instructions, operation and maintenance manuals, list of materials for the maintenance, parts list, wiring diagrams, testing reports, warranties, certifications, and name and address of authorized service organization(s).
- B. Information shall be folded only if necessary, and bound in an 8-1/2" x 11" hard cover indexed, loose-leaf binder. Multiple binders shall be used if required to contain material. All material shall be properly identified with job name, date, and the names and addresses of the Contractor, Architect, and Engineer.
- C. The portfolios shall be submitted to the Engineer for review of material and completeness prior to final observation, and when approved by the Engineer, the portfolios will be turned over to the Owner at the time of the final observation.
- D. Provide a copy of the final panelboard schedules (updated with any changes from addendum, revisions and change orders) in each set of the operation and maintenance manuals. Copies of panel schedules are to be provided in the operation and maintenance manuals in case circuit directories in the panelboards are lost.

3.4 CLEANING

- A. On completion of installation, including outlets, fittings, boxes, raceways and devices, inspect exposed finish. Remove burrs, dirt, paint spots, and construction debris.
- B. Protect equipment and installations and maintain conditions to ensure that coatings, finishes and cabinets are without damage or deterioration at time of substantial completion.
- C. For wall mounted devices, internally clean devices, device outlet boxes and enclosures. Replace stained or improperly painted wall plates or devices.
- D. For enclosures, inspect interior and exterior of enclosure. Remove paint splatters and other spots. Vacuum dirt and debris, do not use compressed air to assist in cleaning. Repair exposed surfaces to match original surface.

3.5 PROJECT CLOSE OUT

- A. Refer to Division 1 sections for general close-out requirements.
- B. Record Drawings: Give special attention to the complete, accurate and legible recording of underground conduit, work of change orders, field changes, other undocumented changes, and panel schedule changes where not shown on contract documents. Record Drawings are for future reference and/or for CAD updates per Owner's request.
- C. Final Payment will not be made until the Contractor has satisfactorily completed all final observation/punch-list items.
- D. Guarantee: All equipment and work shall be fully guaranteed, parts and labor for one year from the date of substantial completion, unless noted otherwise. The Contractor is to extend warranty based on substantial completion date. The Contractor has the full responsibility to guarantee all equipment and work and shall assume full responsibility to repair any equipment at his cost which the manufacturer refuses to guarantee. Also, if devices are used during the course of the construction, the Contractor shall extend the warranty so that the warranty period begins at the date of substantial completion. The Owner has the right to order repairs to any equipment or work provided under these drawings and specifications and to charge the Contractor for the same if repairs are not made during a reasonable period of time not to exceed 24 hours during an emergency or 72 hours on a non-critical item.

END OF SECTION 26 01 00

SECTION 26 02 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, system software, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, system software, subsystems, and equipment.
 - 3. Presentation of system operation and maintenance manual and training video tapes if applicable.
- B. Related Sections include the following:
 - 1. Division 26 Section "Electrical Common Requirements" for related project closeout procedures.
- C. Furnish demonstration and training instruction time for systems as specified in Part 3 of this Specification Section.
- D. Length of instruction time will be measured by actual time spent performing demonstration and training in required location. Time spent assembling educational materials, setting up, or cleaning up will not be counted as part of time allotment.

1.3 SUBMITTALS

- A. Instruction Program: Submit three copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module.
- B. Qualification Data: For firms and persons specified in "Quality Assurance" Article 1.4 of this Section to demonstrate their capabilities and experience.
- C. At completion of training submit the following.
 - 1. Attendance Record. For each training module, include list of participants and length of instruction time.
 - 2. Owner participation and Engineer approval verification form. For each training module, include a signed form indicating the Owner's participation and Engineer's approval of the associated training module. Without this signed form, the training module will not be accepted as meeting the requirements of the specification.

- D. Factory supplied Demonstration and Training Videotapes (if applicable): Submit two copies within seven days of end of each training module.

1.4 QUALITY ASSURANCE

- A. Instructor Qualifications: A factory-authorized service representative, experienced in operation and maintenance procedures and training of the specific system.
- B. Pre-instruction Conference: Conduct conference at Project site to verify that all interested and appropriate parties plan to attend demonstration and training modules.
 - 1. Inspect and discuss locations and other facilities required for instruction.
 - 2. Review and finalize instruction schedule and verify availability of educational materials, instructors' personnel, audiovisual equipment, and facilities needed to avoid delays.
 - 3. Review required content of instruction.
 - 4. For instruction that must occur outside, review weather and forecasted weather conditions and procedures to follow if conditions are unfavorable.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved operation and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Engineer.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and equipment not part of a system, as required by individual Specification Sections, and as follows:
 - 1. Specification Section 28 31 11 "Fire Alarm Systems"
 - 2. Lighting control systems
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following:
 - 1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, system software, subsystem, and equipment descriptions

- b. Performance standards
 - c. Operating standards
 - d. Regulatory requirements
 - e. Equipment function
 - f. Operating characteristics
 - g. Limiting conditions
2. Documentation: Review the following items in detail as applicable:
- a. Operations manuals
 - b. Maintenance manuals
 - c. Identification systems
 - d. Warranties – include length and terms of policy
 - e. Maintenance service agreements and similar continuing commitments
3. Emergencies: Include the following, as applicable:
- a. Instructions on meaning of warnings, trouble indications, and error messages
 - b. Instructions on stopping
 - c. Shutdown instructions for each type of emergency
 - d. Operating instructions for conditions outside of normal operating limits
 - e. Sequences for electric or electronic systems
 - f. Special operating instructions and procedures
4. Operations: Include the following, as applicable:
- a. Startup procedures
 - b. Equipment or system break-in procedures
 - c. Routine and normal operating instructions
 - d. Regulation and control procedures
 - e. Control sequences
 - f. Safety procedures
 - g. Instructions on stopping
 - h. Normal shutdown instructions
 - i. Operating procedures for emergencies
 - j. Operating procedures for system, system software, subsystem, or equipment failure
 - k. Seasonal and weekend operating instructions
 - l. Required sequences for electric or electronic systems
 - m. Special operating instructions and procedures
5. Adjustments: Include the following:
- a. Alignments
 - b. Checking adjustments
 - c. Noise and vibration adjustments
 - d. Economy and efficiency adjustments

6. Troubleshooting: Include the following:
 - a. Diagnostic instructions
 - b. Test and inspection procedures
7. Maintenance: Include the following:
 - a. Inspection procedures
 - b. Types of cleaning agents to be used and methods of cleaning
 - c. List of cleaning agents and methods of cleaning detrimental to product
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance
 - f. Procedures for routine maintenance
 - g. Instruction on use of special tools
8. Repairs: Include the following:
 - a. Diagnosis instructions
 - b. Repair instructions
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions
 - d. Instructions for identifying parts and components
 - e. Review of spare parts needed for operation and maintenance

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Contractor and Owner for number of participants, instruction times, and location.
- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, system software, subsystems, and equipment not part of a system.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 1. Schedule training with Owner, through the Engineer with at least seven days' advance notice.
- D. Evaluation: At conclusion of each training module, assess and document each participant's mastery of module by use of a demonstration performance-based test.

- E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING TIME ALLOTMENT

- A. Furnish demonstration and training instruction time for individual systems as follows:
 - 1. Specification Section 28 31 11 "Fire Alarm Systems" - 2 hours
 - 2. Lighting Control System - 2 hours

END OF SECTION 26 02 00

SECTION 26 05 00 - BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following electrical materials and methods:
 - 1. Supporting devices for electrical components
 - 2. Sleeves for electrical raceways/cables
 - 3. Firestopping
 - 4. Touchup painting
 - 5. Cutting and patching
 - 6. Trenching, compacting and backfilling
 - 7. Electrical demolition

1.3 SUBMITTALS

- A. General: No submittals required this section.

1.4 QUALITY ASSURANCE

- A. Comply with the 2020 National Electrical Code for components and installation.
- B. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed and Labeled": As defined in the National Electrical Code, Article 100.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate electrical equipment installation with other building components.
- B. Arrange for chases, slots, and openings in building structure during progress of construction to allow for electrical installations.
- C. Coordinate installation of required supporting devices and setting of sleeves in poured-in-place concrete and other structural components as they are constructed.
- D. Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment requiring positioning prior to closing in the building.
- E. Coordinate connecting electrical service to components furnished under other Sections.

- F. Coordinate connecting electrical systems with exterior underground and/or overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies.

PART 2 - PRODUCTS AND INSTALLATION

2.1 SUPPORTING DEVICES

- A. Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components.
 - 1. Material: Steel, except as otherwise indicated, protected from corrosion with zinc coating or with treatment of equivalent corrosion resistance using an alternative finish.
 - 2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, except as otherwise indicated.
- B. Steel channel supports have 9/16-inch diameter holes at a maximum of 8" o.c., in at least 1 surface.
 - 1. Fittings and accessories mate and match with channels and are from the same manufacturer.
 - 2. Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel, except as otherwise indicated.
- C. Raceway and Cable Supports: Riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring steel clamps or "click"- type hangers.
- D. Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for non-armored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable iron casting with hot-dip galvanized finish.
- E. Expansion Anchors: Carbon-steel wedge or sleeve type.
- F. Toggle Bolts: All-steel springhead type.
- G. Powder-Driven Threaded Studs: Heat-treated steel.
- H. Damp Locations and Outdoors: Hot-dip galvanized materials.
- I. Dry Locations: Steel materials with corrosion protection as appropriate for the installation.
- J. Support Clamps for PVC Raceways: Click-type clamp system. Two hole straps may also be used. All straps/clamps used to support PVC raceways shall be non-metallic.
- K. Conform to manufacturer's recommendations for selecting supports.
- L. Strength of Supports: Adequate to carry all present and future loads, times a safety factor of at least 4; 200-lb- minimum design load.

- M. Install devices to securely and permanently fasten and support electrical components.
- N. Raceway Supports: Comply with National Electrical Code and the following requirements:
1. Conform to manufacturer's recommendations for selecting and installing supports.
 2. Install individual and multiple raceway hangers and riser clamps to support raceways. Provide U bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
 3. Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.
 4. Spare Capacity: Size supports for multiple conduits so capacity can be increased by a 25 percent minimum in the future.
 5. Support individual horizontal raceways with separate steel clamps or straps.
 6. Hanger Rods: 1/4-inch diameter or larger threaded steel, except as otherwise indicated.
 7. Spring Steel Fasteners: Specifically designed for supporting single conduits or tubing. May be used for 1-1/2-inch and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings and for fastening raceways to channel and slotted angle supports.
 8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports, with no weight load on raceway terminals.
 9. Steel straps used to support raceways larger than 1" trade size, shall be of the two-hole variety. Single hole straps/clamps may be used for raceways not exceeding 1" trade size.
- O. Miscellaneous Supports: Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices except where components are mounted directly to structural features of adequate strength.
- P. In open overhead spaces, support sheet metal boxes directly from the building structure or by bar hangers. Where bar hangers are used, attach the bar to raceways on opposite sides of the box and support the raceway with an approved fastener not more than 24" from the box.
- Q. Fastening: Unless otherwise indicated, securely fasten electrical items and their supporting hardware to the building structure. Perform fastening according to the following:
1. Fasten by means of wood screws or screw-type nails on wood; toggle bolts on hollow masonry units; concrete inserts or expansion bolts on concrete or solid masonry; and by machine screws, welded threaded studs, or spring-tension clamps on steel.
 2. Threaded studs driven by a powder charge and provided with lock washers and nuts may be used instead of expansion bolts, machine screws, or wood screws.
 3. Welding to steel structure may be used only for threaded studs, not for conduits, pipe straps, or any other items.
 4. In partitions of light steel construction use sheet-metal screws.
 5. Fill and seal holes drilled in concrete and not used.

6. Select fasteners so the load applied to any fastener does not exceed 25 percent of the proof-test load.
- R. When fastening to metal decking, all fasteners shall be installed in the “hollow” lower decking channel. Fastening through the upper flat portion of the decking rather than the “hollow” lower channel is not allowed. Fasteners shall not be longer than the depth of this “hollow” lower channel in order to ensure that the fastener does not puncture the roof membrane or extend into the roof tapering material.
- S. Electrical devices located within suspended ceiling tiles (motion detectors, smoke detectors, intercom speakers, exit lights, etc.) shall not be supported by the suspended ceiling tile. Rated bar hangers connected to the suspended ceiling grid shall be used to support these devices.

2.2 SLEEVES FOR ELECTRICAL RACEWAYS/CABLES

- A. General: The Electrical Contractor shall provide all sleeves for electrical items as described below.
- B. Install for all cable and raceway penetrations of poured in place concrete walls and floors other than slab on grade. Install for all cable penetrations of masonry and fire rated or non-fire rated gypsum walls.
- C. Sleeves shall be installed during the construction of applicable walls. If any gap remains between the sleeve and the surrounding surface, this gap shall be patched with the appropriate material. Provide weatherproofing as appropriate.
- D. Sheet-Metal Sleeves: 0.0276-inch or heavier galvanized sheet steel, round tube, closed with welded longitudinal joint.
- E. Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.
- F. Appropriately sized EMT conduit may be used in lieu of sheet metal sleeves for all interior penetrations.
- G. All sleeves serving electrical cables shall be equipped with screw-on or nonmetallic bushings on both ends.

2.3 FIRESTOPPING

- A. General: The Electrical Contractor shall provide all firestopping as described below.
- B. Apply to cable and raceway penetrations of fire-rated floor and wall assemblies. Perform firestopping as specified in Division 26 Section “Electrical Firestopping” to reestablish the original fire-resistance rating of the assembly at the penetration.

2.4 TOUCHUP PAINTING

- A. General: The Electrical Contractor shall provide all touchup painting for electrical related items as described below.

- B. For Equipment: Provided by equipment manufacturer and selected to match equipment finish.
- C. For Non-Equipment Surfaces: Matching type and color of undamaged, existing adjacent finish.
- D. For Galvanized Surfaces: Zinc-rich paint recommended by item manufacturer.
- E. Thoroughly clean damaged areas and provide primer, intermediate, and finish coats to suit the degree of damage at each location.
- F. Follow paint manufacturer's written instructions for surface preparation and for timing and application of successive coats.

2.5 CUTTING AND PATCHING

- A. General: The Electrical Contractor shall provide all cutting and patching for electrical related items as described below.
- B. Cut, channel, chase, and drill floors, walls, partitions, ceilings, and other surfaces necessary for electrical installations. Perform cutting by skilled mechanics of the trades involved. If agreement is made for others to perform the necessary cutting and patching, the Electrical Contractor is responsible for final quality control.
- C. Repair disturbed surfaces to match adjacent undisturbed surfaces. Patch and finish back to original condition.

2.6 TRENCHING, COMPACTING AND BACKFILLING

- A. General: The Electrical Contractor shall provide all trenching, compacting and backfilling for electrical related items as described below.
- B. Trench, compact and backfill as necessary for electrical installations. Perform work by skilled mechanics of the trades involved. Trenching, compacting and backfilling are specified in Division 2.
- C. Repair disturbed surfaces to match adjacent undisturbed surfaces.

2.7 DEMOLITION

- A. General: The Electrical Contractor shall provide all electrical demolition as described below.
- B. Where electrical work to remain is damaged or disturbed in the course of the Work, remove damaged portions and install new products of equal capacity, quality, and functionality.
- C. Accessible Work Indicated to Be Demolished: Remove exposed electrical installation in its entirety.

- D. Abandoned Work: Cut and remove buried raceway and wiring indicated to be abandoned in place, 2 inches below the surface of adjacent construction. Cap and patch surface to match existing finish.
- E. Removal: Remove demolished material from the project site. All material shall be disposed of in accordance with EPA guidelines.
- F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational components indicated for relocation.
- G. Reconnect all circuits interrupted by demolition that are to remain in service. Extend existing raceway and conductors as required.
- H. Coordinate and schedule all necessary power outages with the Owner prior to proceeding with such work. This shall be done to ensure that normal operations of the building are not interrupted without prior approval.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION REQUIREMENTS

- A. Install components and equipment to provide the maximum possible headroom where mounting heights or other location criteria are not indicated.
- B. Install items level, plumb, parallel and perpendicular to other building systems and components, except where otherwise indicated.
- C. Install equipment to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.
- D. Give right of way to raceways and piping systems installed at a required slope.
- E. Coordinate all device heights prior to rough in with architectural cabinetry, counter tops, mirror locations, and backsplashes. Coordinate with architectural plans and elevations.
- F. All conduit roof penetrations to mechanical units shall be inside of mechanical mounting curbs for unit being powered. No separate penetrations allowed.
- G. Electrical equipment shall be installed in a neat and workmanlike manner.
- H. The height of electrical device boxes shall not exceed 48" to the top of the box unless noted otherwise. Electrical boxes located within a wall built of concrete masonry units (CMU) shall align the CMU joint with the top or bottom of the box and shall be consistent throughout the project. Cutting the device box into the center of a CMU in order to achieve the general specified height is not necessary unless specifically noted otherwise.
- I. Associated electrical devices (power and data receptacles, data and telephone receptacles, etc.) shall be installed within 13" of each other measured center to center. In stud construction, the Electrical Contractor shall provide framing as necessary to install these devices within the given dimensions.

- J. Provide separate feed for each lighting fixture. Fixtures shall not be connected in a "daisy-chain" arrangement. Flexible metal conduit (FMC) -3/8" minimum size or #12 AWG type AC cable containing 3 conductors and a bonding tape may be used for fixture connections. Regardless of connection method, fixture whips shall not exceed 6'-0" in length.
- K. Provide manufacturers approved bushings at all AC cable termination points.

END OF SECTION 26 05 00

SECTION 26 05 19 - CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes building conductors and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the conditions of the contract and Division 1 Specification Sections.
- B. Product Data for branch circuit connectors and splices.

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide conductors and cables specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with the 2020 National Electrical Code.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver conductors and cables according to NEMA WC 26.

1.6 COORDINATION

- A. Coordinate layout and installation of cables with other installations.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Conductors and Cables:
 - a. United Wire and Cable
 - b. General Cable
 - c. Southwire Company

- d. CME Wire and Cable
- e. Encore Wire Corp.

2. Connectors for Conductors and Cables:

- a. AMP Incorporated
- b. General Signal; O-Z/Gedney Unit
- c. Square D Co.; Anderson
- d. 3M Company; Electrical Products Division
- e. WAGO COMPACT lever style terminal block splicing connectors

2.2 BUILDING CONDUCTORS AND CABLES

- A. UL-listed building conductors and cables with conductor material, insulation type, cable construction, and rating as specified in Part 3 "Conductors and Insulation Applications" Article.
- B. Rubber Insulation Material: Comply with NEMA WC 3.
- C. Thermoplastic Insulation Material: Comply with NEMA WC 5.
- D. Cross-Linked Polyethylene Insulation Material: Comply with NEMA WC 7.
- E. Ethylene Propylene Rubber Insulation Material: Comply with NEMA WC 8.
- F. Conductor Material: Copper
- G. Stranding: Solid conductor for No. 12 AWG and smaller; stranded conductor for No. 8 AWG and larger, No. 10 AWG to be either solid or stranded (contractor's preference).

2.3 CONNECTORS AND SPLICES

- A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated.
- B. For 20 amp circuits utilizing 10 AWG and smaller cable, twist style pressure connectors (i.e. wire nuts/twist lock connectors) or lever style splicing terminal block connectors (WAGOs) may be used.
- C. Comply with project's installation requirements and as specified in Part 3 "Conductor and Insulation Applications".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine raceways and building finishes to receive conductors and cables for compliance with requirements for installation tolerances and other conditions affecting performance of conductors and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 CONDUCTOR AND INSULATION APPLICATIONS

- A. Service Entrance: Type THHN/THWN copper, in raceway
- B. Feeders: Type THHN/THWN copper, in raceway
- C. Branch Circuits: Type THHN/THWN copper, in raceway
- D. Branch Circuits: Type MC cable which contains circuit conductors and a grounding conductor in addition to the metal cladding, 90°C insulation
- E. Control Circuits: Type THHN/THWN copper, in raceway

3.3 INSTALLATION

- A. Install conductors and cables as required, according to manufacturer's written instructions and NECA's "Standard of Installation."
- B. Pull Conductors: Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.
- C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
- D. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
- E. Support cables according to Division 26 Section "Basic Electrical Materials and Methods."
- F. Seal around cables penetrating fire-rated elements according to Division 26 Section "Electrical Firestopping."
- G. Identify conductors and cables according to Division 26 Section "Electrical Identification."
- H. MC cable which contains circuit conductors and a grounding conductor in addition to the metal cladding can be used for light fixture whips and branch circuits, as long as the local jurisdiction allows the use of MC cable.
- I. AC cable containing 3 conductors (hot, neutral, equipment ground) and a bonding tape is allowed for light fixture whips only. All AC cables shall be terminated with proper bushings. Wire gauge shall be #12 AWG min. reduced size conductors are not allowed.

3.4 CONNECTIONS

- A. Conductor Splices: Keep to minimum. No splices or wire nuts allowed in panelboards. Pull adequate conductor lengths to eliminate splices and wire nuts in panels.
- B. Install splices and taps that possess equivalent or better mechanical strength and insulation ratings than conductors being spliced.

- C. Use splice and tap connectors compatible with conductor material.
- D. Wiring at Outlets: Install conductor at each outlet, with at least 7 inches of slack. Where multiple sets of conductors enter a box, provide 7 inch pigtails to devices and make connections such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. All unused device terminal screws shall be turned completely in. Provide two full wraps of electrical tape around all device terminals. On 20 amp circuits where #10 AWG conductors are required for home run per drawings, provide #12 AWG solid pigtails for connection to device. Do not use crimp connections/stranded wire on devices. Exception: Stranded pigtails with factory crimped connectors.
- E. Connect outlets and components to wiring and to ground as required.
- F. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

- A. Testing: On installation of conductors and cables and before electrical circuitry has been energized, verify product capability and compliance with industry standard requirements.
- B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to verify compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 26 05 19

SECTION 26 05 26 - GROUNDING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 26 Section "Conductors and Cables" for requirements for grounding conductors.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for grounding rods, connectors and connection materials, and grounding fittings.

1.4 QUALITY ASSURANCE

- A. Comply with the 2020 National Electrical Code.
- B. Comply with UL 467.
- C. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Apache Grounding; Nashville Wire Products
 - 2. Boggs: H. L. Boggs & Co.

3. Erico Inc.; Electrical Products Group
4. Kearney
5. Korns: C. C. Korns Co.
6. Lightning Master Corp.
7. Lyncole XIT Grounding
8. O-Z/Gedney Co.
9. Raco, Inc.
10. Thomas & Betts, Electrical
11. Greaves
12. Burndy
13. Panduit

2.2 GROUNDING AND BONDING PRODUCTS

- A. Governing Requirements: Where types, sizes, ratings, and quantities indicated are different than the National Electrical Code (NEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

2.3 CONDUCTOR AND CABLE GROUNDING CONDUCTORS

- A. Comply with Division 26 Section "Conductors and Cables." Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.
 1. Material: Use only copper wire for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.
- B. Equipment Grounding Conductors: Insulated with green color insulation. Equipment grounding conductors larger than No. 6 Awg. shall be permanently identified as an equipment grounding conductor at each end and at every point where the conductor is accessible per NEC article 250-119.
- C. Grounding-Electrode Conductors: Stranded cable
- D. Underground Conductors: Bare, tinned, stranded
- E. Bare Copper Conductors: Conform to the following:
 1. Solid Conductors: ASTM B 3
 2. Assembly of Stranded Conductors: ASTM B 8
 3. Tinned Conductors: ASTM B 33

2.4 MISCELLANEOUS CONDUCTORS

- A. Bonding Straps: Soft copper, 0.05 inch thick and 2 inches wide.

2.5 CONNECTOR PRODUCTS

- A. Pressure Connectors: High-conductivity-plated units, for connections to conductors and ground rods.

- B. Bolted Clamps: Heavy-duty type, for connections to water pipes.
- C. Exothermic-Welded Connections: Provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.
- D. Welded tail: For connections to structural steel.

2.6 GROUNDING ELECTRODES

- A. Grounding Rods: Sectional type; copper-clad steel.
 - 1. Size: 3/4 inch by 120 inches

PART 3 - EXECUTION

3.1 APPLICATION

- A. Grounding Electrode System: Provide grounding electrode system per NEC Article 250-50, size grounding electrode conductors per NEC Table 250-66.
- B. Equipment Grounding Lugs in Motor Starters and Disconnects: Provide UL approved lugs bonded to enclosure for terminating equipment grounds within motor starters and disconnects.
- C. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.
 - 1. Install equipment grounding conductor with circuit conductors for the items below in addition to those required by Code:
 - a. Feeders and branch circuits
 - b. Lighting circuits
 - c. Receptacle circuits
 - d. Motor or appliance branch circuits

All conduit types allowed for the above installations shall not be used for the only equipment ground. Provide equipment grounding conductors throughout entire run in all raceway types.

- 2. Air-Duct Equipment Circuits: Install an equipment grounding conductor to duct-mounted electrical devices operating at 120 V and above, including air cleaners and heaters. Bond conductor to each unit and to air duct.
- 3. Water Heater Circuits: Install a separate equipment grounding conductor to each electric water heater. Bond conductor to heater units, piping, connected equipment, and components.
- D. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide a No. 6 AWG minimum insulated grounding conductor

in raceway from electrical service ground bus to each signal and communications system service location, terminal cabinet, wiring closet, and central equipment location.

1. Signal and Communications Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on backboard grounding bus and on ground bus in main service panel.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

3.2 INSTALLATION

- A. General: Ground electrical systems and equipment according to NEC requirements, except where Drawings or Specifications exceed NEC requirements.
- B. Grounding Rods: Locate ground rods a minimum of 2-rod lengths from each other and at least the same distance from any other grounding electrode outside of the building at least 10' from the building edge.
 1. Drive until tops are 24 inches below finished floor or final grade, except as otherwise indicated.
 2. Provide individual #6 AWG/CU grounding electrode conductor from each ground rod to ground bus within switchboard or main panelboard.
- C. Grounding Conductors: Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage. Do not make sharp bends in conductors.
- D. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches below grade.
- E. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized per NEC Table 250-66, in conduit, from building's main service equipment grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where a dielectric main water fitting is installed, provide separate grounding conductor from street side of fitting and building side of fitting to electrical service ground bar. Do not install a grounding jumper across dielectric fittings.
- F. Bond metal grounding electrode conductor conduit to grounding electrode conductor via bonding bushing at each end of conduit or use PVC conduit.
- G. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.
- H. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.
- I. Provide grounding electrode conductor from grounding bus of main switchboard to structural steel per NEC 250.52(A)(2). Size per NEC 250-66. If available structural steel is a structural steel column, provide hydraulic compression from at least one anchor bolt

of structural steel column to rebar system below. Coordinate work with General Contractor.

- J. Concrete-Encased Grounding Electrode at Service Entrance: Fabricate according to NEC Paragraph 250.52(A)(3), using a minimum of 20 feet of bare copper conductor not smaller than No. 4 AWG. Where base of concrete foundation is less than 20 feet in length, coil excess conductor within base of concrete foundation. Provide exothermic bond of grounding electrode conductor to rebar in at least 4 locations. Coordinate work with General Contractor.
- K. Provide Ground Rods Bonded to Rebar/Structural Steel at Building Corners: Provide exothermic or hydraulic compression connection from structural steel, above outside masonry block wall of building, to rebar system in building footings (see drawings for designated locations). Bonding conductor to be routed through masonry block wall from structural steel to rebar in building footings. From rebar connection, provide compression bond to a ground rod electrode. Ground rod electrode to be driven at the bottom of the footing near bonding location. Size bonding conductor per NEC Paragraph 250-66. Coordinate work with General Contractor.
- L. See grounding detail on drawings.

3.3 CONNECTIONS

- A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - 1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
 - 2. Make connections with clean, bare metal at points of contact.
 - 3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
 - 4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
 - 5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.
- B. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor. Approved manufacturer- Burndy Hyground Grounding Connector System or Panduit Structured Ground Direct Burial compression Connector System.
- C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors. Equipment grounding conductors twisted together without a connector is not acceptable.
- D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each

conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically non-continuous conduits at both entrances and exits with grounding bushings and bare grounding conductors.

- E. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.
- F. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

END OF SECTION 26 05 26

SECTION 26 05 33 - RACEWAYS AND BOXES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes raceways, fittings and boxes for electrical wiring.
 - 1. Raceways include the following:
 - a. RMC: Rigid metal conduit
 - b. IMC: Intermediate metal conduit
 - c. EMT: Electrical metallic tubing
 - d. FMC: Flexible metal conduit
 - e. LFMC: Liquid tight flexible metal conduit
 - f. RNC: Rigid nonmetallic conduit (PVC)
 - g. Wireways
 - 2. Boxes include the following:
 - a. Outlet and Device boxes
 - b. Pull and junction boxes
- B. Related Sections include the following:
 - 1. Division 26 Section "Electrical Firestopping" for firestopping requirements.
 - 2. Division 26 Section "Basic Electrical Materials and Methods" for raceways and box supports.
 - 3. Division 26 Section "Wiring Devices" for devices installed in boxes.

1.3 SUBMITTALS

- A. Shop Drawings: Include product data and drawings showing the following components:
 - 1. Conduit with color indications as required
 - 2. Conduit fittings to be utilized
 - 3. Insulated Bushings for Rigid and IMC Conduit
 - 4. EMT Push-On Insulated Bushings

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide raceways and boxes specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

- B. Comply with NECA's "Standard of Installation."
- C. Comply with the 2020 National Electrical Code.

1.5 COORDINATION

- A. Coordinate layout and installation of raceways and boxes with other construction elements to ensure adequate headroom, working clearance, and access.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Metal Conduit and Tubing:
 - a. Allied Tube and Conduit
 - b. Western Tube and Conduit
 - c. Republic Conduit
 - d. Wheatland Conduit
 - 2. Nonmetallic Conduit:
 - a. Cantex
 - b. Heritage Plastics
 - c. Ipex
 - d. JM Eagle
 - e. Kraloy
 - f. Prime
 - g. PW Pipe
 - h. Ridgeline
 - i. Southern Pipe
 - 3. Conduit Bodies and Fittings:
 - a. Carlon Electrical Products/Thomas & Betts
 - b. Crouse-Hinds; Div. of Cooper Industries
 - c. Hubbell, Inc.; Killark Electric Manufacturing Co.
 - d. O-Z/Gedney/Emerson Industrial/Appleton
 - e. Bridgeport Fittings
 - 4. Metal Wireways:
 - a. B-Line
 - b. Hoffman Engineering Co.
 - c. Milbank Manufacturing
 - d. Square D Co.

5. Boxes:
 - a. American Electric; FL Industries
 - b. Arlington Industries
 - c. Butler Manufacturing Co.; Walker Division
 - d. Cooper Wiring Devices
 - e. Crouse-Hinds; Div. of Cooper Industries
 - f. Hoffman Engineering Co.; Federal-Hoffman, Inc.
 - g. Hubbell Inc.; Killark Electric Manufacturing Co.
 - h. Hubbell Inc.; Raco, Inc.
 - i. Intermatic
 - j. Lamson & Sessions; Carlon Electrical Products
 - k. O-Z/Gedney; Unit of General Signal
 - l. Robroy Industries, Inc.; Electrical Division
 - m. Thomas & Betts Corp.
 - n. Woodhead Industries, Inc.; Daniel Woodhead Co.

2.2 METAL CONDUIT AND TUBING

- A. Rigid Steel Conduit: ANSI C80.3
- B. Intermediate Metal Conduit: ANSI C80.6
- C. Electrical Metallic Tubing and Fittings: ANSI C80.3 and UL 514B-2012
 1. Fittings: Set-screw or compression type, die cast zinc, zinc-coated steel. Malleable fittings are not acceptable. Provide insulated throat connectors for circuits over 150 volts to ground, motor circuits, and for conduit size 1 inch and larger.
 2. Conduit Colors: Provide conduit in the required color. Conduit color must be continuous and pre-manufactured from conduit supplier. Allied "True Color" EMT or similar. See specifications section 26 05 53 – Electrical Identification
- D. Flexible Metal Conduit: Zinc-coated steel
- E. Liquid Tight Flexible Metal Conduit: Flexible steel conduit with PVC jacket
- F. Fittings: All fittings shall be listed UL 514B-2012 and NEMA FB-1, die cast zinc fittings must be manufactured with ASTM B86 certified materials.
- G. Rigid Steel and IMC Bushings: Provide insulated bushings or insulated throat hubs on the ends of Rigid Steel Conduit and IMC where the conduit enters a box. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.
- H. EMT Stub Bushings: Provide for systems and lighting control conduit stubs and all open start and end points – "Arlington Industries" insulated nylon push-on bushings.
 1. Listed for environmental air handling spaces.
 2. Provide trade size as needed, EMT75, EMT100, etc.

3. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.

2.3 NONMETALLIC CONDUIT

- A. Rigid Nonmetallic Conduit: NEMA TC 2, Schedule 40 and/or 80 PVC, per wiring methods.
- B. Rigid Nonmetallic Conduit Fittings: NEMA TC 3; match to conduit type and material.
- C. Bushings: Provide insulated bushings on the ends of conduit where the conduit enters a box for circuits over 150 volts to ground, motor circuits, and for conduit size 1 inch and larger. Install bushings before wire is pulled in conduit, do not slit or cut bushing to install after wire has been pulled in conduit.

2.4 METAL WIREWAYS

- A. Material: Sheet metal sized and shaped as required.
- B. Fittings and Accessories: Include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- C. Select features, unless otherwise indicated, as required to complete wiring system and to comply with 2020 National Electrical Code.
- D. Wireway Covers: Screw-cover type.
- E. Finish: Manufacturer's standard enamel finish.

2.5 OUTLET AND DEVICE BOXES

- A. Sheet Metal Boxes: NEMA OS 1
- B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover for outside applications, unless noted otherwise.
- C. Size as required by NEC article 314.
- D. Weatherproof Receptacle boxes/covers: Provide recessed, weatherproof-while-in-use, low profile, receptacle boxes with covers with a maximum protrusion (box and cover) from the building of 1" inch. (Approved manufacturers include Arlington Industries, Cooper Wiring Devices, and Intermatic.) No surface boxes or covers allowed for outlets on the outside of the building.

2.6 PULL AND JUNCTION BOXES

- A. Small Sheet Metal Boxes: NEMA OS 1
- B. Cast-Metal Boxes: NEMA FB 1, cast aluminum with gasketed cover for outside applications.

- C. Size as required by NEC article 314.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces to receive raceways and boxes for compliance with installation tolerances and other conditions affecting performance of raceway installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 WIRING METHODS - (ENT - Electrical Non-metallic Tubing is not acceptable anywhere on this project.)

- A. Outdoors: Use the following wiring methods:
 - 1. Exposed: Rigid steel or IMC
 - 2. Underground: RNC, Rigid steel, or IMC
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC
 - 4. Boxes: NEMA 250, Type 3R or Type 4
- B. Indoors: Use the following wiring methods:
 - 1. Exposed: EMT
 - 2. Concealed: EMT
 - 3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except in wet or damp locations, use LFMC.
 - 4. Damp or Wet Locations: Rigid steel or IMC
 - 5. Under concrete slab floor: RNC, Rigid steel, or IMC
 - 6. Boxes: NEMA 250, Type 1, except in damp or wet locations use NEMA Type 3R or Type 4.

3.3 INSTALLATION

- A. Install raceways and boxes as required, according to manufacturer's written instructions.
- B. Minimum Raceway Size: 1/2-inch trade size. Light fixture whips may be 3/8".
- C. Conceal all conduit, unless otherwise indicated, within finished walls, ceilings, and below floors.
- D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
- E. Install raceways level and square and at proper elevations. Provide adequate headroom.
- F. Support raceways as specified in Division 26 Section "Basic Electrical Materials and Methods." Use raceway straps and supports compatible with raceways and suitable for

use and location. Do not use tie-wire or any other method not specifically designed for use with electrical raceways.

- G. Use temporary closures to prevent foreign matter from entering raceways.
- H. Make bends and offsets so inside diameter is not reduced. Keep legs of bends in the same plane and straight legs of offsets parallel, unless otherwise indicated.
- I. Where a conduit enters a box make offset such that the conduit is perpendicular to the box, conduit fitting fits squarely into the knock-out and the box is level when conduit termination is complete. Provide an offset regardless of whether the conduit is exposed or concealed within a wall or ceiling.
- J. Use raceway fittings compatible with raceways and suitable for use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings, unless otherwise indicated.
- K. Run concealed raceways, with a minimum of bends, in the shortest practical distance considering the type of building construction and obstructions, unless otherwise indicated.
- L. No Raceways Embedded in Slabs: Install conduit a minimum of 4 inches below bottom of concrete slab where routing raceway underfloor.
 - 1. Transition nonmetallic conduit to rigid steel conduit or IMC before rising above floor slabs, where above floor conduit is to be exposed.
 - 2. Transition nonmetallic conduit to EMT immediately after rising above floor slabs, where above floor conduit is to be concealed in a wall. Transition to EMT is not required when conduit is terminating in recessed box not more than 18 inches above the floor.
 - 3. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- M. Install exposed raceways parallel to or at right angles to nearby surfaces or structural members, and follow the surface contours as much as practical.
 - 1. Run parallel or banked raceways together, on common supports where practical.
 - 2. Make bends in parallel or banked runs from same centerline to make bends parallel. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- N. Join raceways with fittings designed and approved for the purpose and make joints tight.
 - 1. Make raceway terminations tight. Use bonding bushings at connections subject to vibration. Use bonding jumpers where joints cannot be made tight.
 - 2. Use insulated throat fittings or insulating bushings to protect conductors as required in this section.
- O. Terminations: Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against the box. Where

terminations are not secure with 1 locknut, use 2 locknuts: 1 inside and 1 outside the box.

- P. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align raceways so the coupling is square to the box and tighten the chase nipple so no threads are exposed.
- Q. Seal Raceways: Provide Ductseal or similar approved product in ends of raceways (to prevent movement of air, thus preventing heat loss/gain and condensation of moisture) in the following locations:
 - 1. Service entrance conduits
 - 2. Where conduits pass from warm to cold locations, such as the boundaries of refrigerated spaces.
 - 3. Where conduits enter or exit the building.
 - 4. Where otherwise required by the National Electrical Code.
- R. Install raceway sealing fittings according to manufacturer's written instructions. Locate fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 - 1. Where conduits enter or exit a hazardous area.
 - 2. Where otherwise required by the National Electrical Code.
- S. Flexible Connections: Use maximum of 6 feet of flexible conduit for recessed and semi-recessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use Liquid tight flexible conduit in wet or damp locations.
- T. Do not install aluminum conduit.
- U. Install structurally mounted pull and junction boxes with at least two screws/bolts, more as required for larger sized boxes.

3.4 PROTECTION

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure coatings, finishes, and cabinets are without damage or deterioration at the time of Substantial Completion.
 - 1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
 - 2. Repair damage to paint finishes with matching touchup coating recommended by manufacturer.

3.5 CLEANING

- A. On completion of installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 26 05 33

SECTION 26 05 53 - ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes identification of electrical materials, equipment, and installations.

1.3 SUBMITTALS

- A. General: No submittals required this section.

1.4 QUALITY ASSURANCE

- A. Comply with the 2020 National Electrical Code.
- B. Comply with ANSI C2.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate installing electrical identification after completion of finishing where identification is applied to field-finished surfaces.
- B. Coordinate installing electrical identifying devices and markings prior to installing acoustical ceilings and similar finishes that conceal such items.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. American Labelmark Co.; Labelmaster Subsidiary
 2. Brady USA, Inc.; Industrial Products Div.
 3. Carlton Industries, Inc.
 4. Ideal Industries, Inc.
 5. National Band & Tag Co.
 6. Panduit Corp.

2.2 RACEWAY AND CABLE LABELS

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, National Electrical Code, and these Specifications.

- B. Adhesive Labels: Preprinted, flexible, self-adhesive vinyl. Legend is over laminated with a clear, weather- and chemical-resistant coating.
- C. Colored Adhesive Tape: Self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide.
- D. Underground Line Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape with the following features:
 1. Size: Not less than 6 inches wide by 4 mils thick.
 2. Compounded for permanent direct-burial service.
 3. Embedded continuous metallic strip or core.
 4. Printed Legend: Indicates type of underground line.

2.3 ENGRAVED NAMEPLATES AND SIGNS

- A. Manufacturer's Standard Products: Where more than one type is listed for a specified application, selection is Installer's option, but provide single type for each application category. Use colors prescribed by ANSI A13.1, National Electrical Code, and these Specifications.
- B. Engraving stock, melamine plastic laminate, 1/16-inch minimum thick for signs up to 20 sq. in., 1/8 inch thick for larger sizes.
 1. Engraved Legend: White letters on black face
 2. Self-adhesive products

2.4 MISCELLANEOUS IDENTIFICATION PRODUCTS

- A. Cable Ties: Fungus-inert, self-extinguishing, 1-piece, self-locking, Type 6/6 nylon cable ties with the following features:
 1. Minimum Width: 3/16 inch
 2. Tensile Strength: 50 lb. minimum
 3. Temperature Range: Minus 40 to 185 deg F (Minus 4 to 85 deg C)
 4. Color: As indicated where used for color coding.
- B. Paint: Alkyd-urethane enamel over primer as recommended by enamel manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install identification devices according to manufacturer's written instructions.
- B. Install labels where indicated and at locations for best convenience of viewing without interference with operation and maintenance of equipment.
- C. Lettering, Colors, and Graphics: Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations used in

the Contract Documents or required by codes and standards. Use consistent designations throughout the Project.

- D. Sequence of Work: Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.
- E. Self-Adhesive Identification Products: Clean surfaces of dust, loose material, and oily films before applying. Be sure to remove any protective surface tape from labels exposed to the sun as soon as installed.
- F. Identify Raceways of Certain Systems - Refer to Specification Section 26 05 33 for conduit requirements:
 - 1. All fire alarm system conduit shall be red.
- G. Install Circuit Identification on Branch Circuit Boxes as Follows:
 - 1. Exposed and Concealed Boxes: Neatly written, permanent black marker indicating panel and circuit numbers within.
- H. Identify Paths of Underground Electrical Lines: During trench backfilling, for exterior underground power, control, signal, and communications lines, install continuous underground plastic line marker located directly above line at 6 to 8 inches below finished grade. Where multiple lines installed in a common trench or concrete envelope do not exceed an overall width of 16 inches, use a single line marker.
 - 1. Install line marker for underground wiring, both direct buried and in raceway.
- I. Color-Code Conductors: Secondary service, feeder and branch circuit conductors throughout the secondary electrical system.
 - 1. 240/120-V Single Phase System: As follows:
 - a. Phase A: Black
 - b. Phase B: Red
 - c. Neutral: White
 - d. Equipment Ground: Green
 - 2. Where two different voltage systems of grounded conductors (neutrals) are present in the same enclosure, junction box or gutter, one neutral may be white or gray, but the other neutral shall be white with a stripe that is not green.
 - 3. Factory-apply color the entire length of the conductors, except the following field-applied, color-coding methods may be used in lieu of factory-coded wire for sizes larger than No. 6 AWG.
 - a. Colored, pressure-sensitive plastic tape in half-lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply the last 2 turns of tape with no tension to prevent possible unwinding. Use 1-inch- wide tape in colors as specified. Adjust tape bands to avoid obscuring cable identification markings.

- b. Colored cable ties applied in groups of 3 ties of specified color to each wire at each terminal or splice point starting 3 inches from the terminal and spaced 3 inches apart. Apply with a special tool or pliers, tighten to a snug fit, and cut off excess length.
- J. Apply identification to conductors as follows:
 - 1. Conductors to Be Extended in the Future: Indicate source and circuit numbers.
- K. Install identification as follows:
 - 1. Apply equipment identification labels of engraved plastic laminate on each major unit of equipment, including central or master unit of each system. This includes communication, signal, and alarm systems, unless units are specified with their own self-explanatory identification. Except as otherwise indicated, provide a single line of text with 1/2-inch- high lettering on 1-1/2-inch- high label; where 2 lines of text are required, use labels 2 inches high. Use white lettering on black field. Apply labels for each unit of the following categories of equipment.
 - a. Panelboards, electrical cabinets, and enclosures
 - b. Access doors and panels for concealed electrical items
 - c. Electrical switchgear and switchboards
 - d. Main breakers and individual multi-phase circuit breaker loads of switchboards and distribution panelboards 400A and above.
 - e. Motor starters
 - f. Push-button stations
 - g. Contactors
 - h. Disconnects
 - 2. For panelboards, provide framed, typed circuit schedules with explicit description and identification of items controlled by each individual breaker. No self-adhesive panel directories will be accepted.
 - 3. Provide red self-adhesive engraved label for circuit breaker feeding fire alarm system marked "FIRE ALARM CONTROL CIRCUIT".
 - 4. For motor starters, provide engraved labels as previously noted. Label shall list motor designation as shown on motor schedule as well as field verified motor horsepower and full load amps. Example: HWP1, 5 HP, 17.5 FLA.
 - 5. Provide fault current plaque on the main panelboard as shown on the electrical one-line riser diagram.

END OF SECTION 26 05 53

SECTION 26 06 00 - ELECTRICAL FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Through-penetration firestopping in fire rated construction.
 - 2. Through-penetration smoke stopping in smoke partitions.

1.2 REFERENCES

- A. Underwriters Laboratories
 - 1. UL Fire Resistance Directory
 - a. Through-penetration firestop devices (XCHR)
 - b. Fire resistance ratings (BXUV)
 - c. Through-penetration firestop systems (XHEZ)
 - d. Fill, void or cavity material (XHHW)
- B. American Society for Testing and Materials Standards:
 - 1. ASTM E 814-88: Standard Test Method for Fire Tests of Through-Penetration Firestops.

1.3 DEFINITIONS

- A. Assembly: Particular arrangement of materials specific to given type of construction described or detailed in referenced documents.
- B. Barriers: Time rated fire walls, smoke barrier walls, time rated ceiling/floor assemblies and structural floors.
- C. Firestopping: Methods and materials applied in penetrations and unprotected openings to limit spread of heat, fire gasses and smoke.
- D. Penetration: Opening or foreign material passing through or into barrier or structural floor such that full thickness of rated materials is not obtained.
- E. System: Specific products and applications, classified and numbered by Underwriters Laboratories, Inc. to close specific barrier penetrations.
- F. Sleeve: Metal fabrication or pipe section extending through thickness of barrier and used to permanently guard penetration. Sleeves are described as part of penetrating system in other sections and may or may not be required.

1.4 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Fire-rated construction: Maintain barrier and structural floor fire resistance ratings including resistance to cold smoke at all penetrations, connections with other surfaces or types of construction, at separations required to permit building movement and sound or vibration absorption and at other construction gaps.
 - 2. Smoke barrier construction: Maintain barrier and structural floor resistance to cold smoke at all penetrations, connections with other surfaces and type of construction and at all separations required to permit building movement and sound or vibration absorption and at other construction gaps.

1.5 SUBMITTALS

- A. Submit in accordance with Section 26 01 00, unless otherwise indicated.
- B. Product Data: Manufacturer's specifications and technical data including the following:
 - 1. Detailed specification of construction and fabrication.
 - 2. Manufacturer's installation instructions.
- C. Shop Drawings: Indicate dimensions, description of materials and finishes, general construction, specific modifications, component connections, anchorage methods, hardware and installation procedures, plus the following specific requirements.
 - 1. Details of each proposed assembly identifying intended products and applicable UL system number or UL classified devices.
 - 2. Manufacturer or manufacturer's representative shall provide qualified engineering judgements and drawings relating to non-standard applications as needed.

1.6 QUALITY ASSURANCE

- A. Local and State Regulatory Requirements: Submit forms or acceptance for proposed assemblies not conforming to specific UL firestop system numbers or UL classified devices.
- B. Materials shall have been tested to provide fire rating at least equal to that of the construction.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Packing and Shipping:
 - 1. Deliver products in original unopened packaging with legible manufacturer's identification.
 - 2. Coordinate delivery with scheduled installation date, allow minimum storage at site.
- B. Storage and Protection: Store materials in a clean, dry, ventilated location. Protect from soiling, abuse, moisture and freezing when required. Follow manufacturer's instructions.

1.8 PROJECT CONDITIONS

A. Existing Conditions:

1. Verify existing conditions and substrates before starting work. Correct unsatisfactory conditions before proceeding.
2. Proceed with installation only after penetrations of the substrate and supporting brackets have been installed.

B. Environmental Requirements:

1. Furnish adequate ventilation if using solvent.
2. Furnish forced air ventilation during installation if required by manufacturer.
3. Keep flammable materials away from sparks or flame.
4. Provide masking and drop cloths to prevent contamination of adjacent surfaces by firestopping materials.

PART 2 - PRODUCTS

2.1 THROUGH-PENETRATION FIRESTOPPING AND FIRE-RATED CONSTRUCTION

A. Systems or devices listed in the UL Fire Resistance Directory under categories XHCR and XHEZ may be used, providing that it conforms to the construction type, penetrant type, annular space requirements and fire rating involved in each separate instance, and that the system be symmetrical for wall applications. Systems or devices must be asbestos free.

1. **Additional Requirements:** Withstand the passage of cold smoke either as an inherent property of the system, or by the use of a separate product included as a part of the UL system or device, and designed to perform this function.
2. **Acceptable Manufacturers and Products:**
 - a. Manufacturer shall be 3M or S.T.I.
 - b. Products shall be listed in the UL Fire Resistance Directory for the UL system.
3. All firestopping products must be from a single manufacturer.

2.2 SMOKE STOPPING AT SMOKE PARTITIONS

A. Through-Penetration Smoke-Stopping: Any system complying with the requirements for through-penetration firestopping in fire-rated construction, is acceptable, provided that the system includes the specified smoke seal or will provide a smoke seal. The length of time of the fire resistance may be disregarded.

2.3 ACCESSORIES

A. Fill, Void or Cavity Materials: As classified under category XHHW in the UL Fire Resistance Directory.

- B. Forming Materials: As classified under category XHKU in the UL Fire Resistance Directory.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verification of Conditions: Examine areas and conditions under which work is to be performed and identify conditions detrimental to proper or timely completion.
 - 1. Verify barrier penetrations are properly sized and in suitable condition for application of materials.
 - 2. Do not proceed until unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean surfaces to be in contact with penetration seal materials of dirt, grease, oil, loose materials, rust or other substances that may affect proper fitting, adhesion, or the required fire resistance.

3.3 INSTALLATION

- A. Install penetration seal materials in accordance with printed instructions of the UL Fire Resistance Directory and in accordance with manufacturer's instruction.
- B. Seal holes or voids made by penetrations to ensure an effective smoke barrier.
- C. Where floor openings without penetrating items are more than four inches in width and subject to traffic or loading, install firestopping materials capable of supporting same loading as floor.
- D. Protect materials from damage on surfaces subject to traffic.
- E. Where large openings are created in walls or floors to permit installation of pipes, ducts, cable tray, bus duct or other items, close unused portions of openings with firestopping material tested for the application. See UL Fire Resistance Directory.
- F. Where rated walls are constructed with horizontally continuous air space, double width masonry or double stud frame construction, provide vertical, 12 inch wide fiber dams for full thickness and height of air cavity at maximum 15 foot intervals.
- G. Install smoke stopping as specified for firestopping.

3.4 FIELD QUALITY CONTROL

- A. Examine penetration sealed areas to ensure proper installation before concealing or enclosing areas.
- B. Keep areas of work accessible until inspection by applicable code authorities.

3.5 ADJUSTING AND CLEANING

- A. Clean up spills of liquid components.
- B. Neatly cut and trim materials as required.
- C. Remove equipment, materials and debris, leaving area in undamaged, clean condition.

END OF SECTION 26 06 00

SECTION 26 24 16 - PANELBOARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.
- B. Related Sections include the following:
 - 1. Division 26 Section "Basic Electrical Materials and Methods" for general materials and installation methods.
 - 2. Division 26 Section "Electrical Identification" for labeling materials.

1.3 SUBMITTALS

- A. Product Data: For each type of panelboard, accessory item, and component specified.
- B. Shop Drawings: For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:
 - 1. Enclosure type with details for types other than NEMA 250, Type 1.
 - 2. Bus configuration and current ratings.
 - 3. Short-circuit current rating of panelboard.
 - 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
 - 5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.
 - 6. Provide cut sheets and time-current curves for all circuit breakers.
- C. Maintenance Data: For panelboard components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers and current copy of dated panel schedule.

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with the 2020 National Electrical Code.

- C. Comply with NEMA PB 1.

1.5 EXTRA MATERIALS

- A. Keys: 6 spares of each type for panelboard cabinet lock.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 1. Eaton Corp.; Cutler-Hammer Products.
 2. General Electric Co.; Electrical Distribution & Control Div.
 3. Siemens Energy & Automation, Inc.
 4. Square D Co.

2.2 PANELBOARD FABRICATION

- A. Enclosures: Flush- or surface-mounted cabinets as indicated. NEMA PB 1, Type 1, unless otherwise indicated to meet environmental conditions at installed location.
 1. Outdoor Locations: NEMA 250, Type 3R.
 2. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.
- B. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. Fronts for flush panelboards shall overlap box, unless otherwise indicated. No exposed screws allowed for fastening front cover to panelboard.
- C. Directory Frame: Metal, mounted inside each panelboard door. No self-adhesive circuit directories allowed. Provide typed circuit directory in metal frame.
- D. Bus: Hard drawn copper of 98 percent conductivity.
- E. Main, Neutral, and Equipment Ground Lugs: Mechanical type. Alternate connection methods by prior approval only.
- F. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.
- G. Service Equipment Approval: Listed for use as service equipment for panelboards with main service disconnect.
- H. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the overcurrent protective device ampere ratings indicated for future installation of devices.

- I. Special Features: Include the following features for panelboards:
 - 1. Hinged Front Cover: Entire front trim hinged to box with standard door within hinged trim cover. Hinge to be concealed.

2.3 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

- A. Branch Overcurrent Protective Devices: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: In panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.
- C. No exposed screws allowed for fastening front cover to panelboard.

2.4 DISTRIBUTION PANELBOARDS

- A. Doors: In panelboard front, except omit in fusible-switch panelboard, unless otherwise indicated. Secure door with vault-type latch with tumbler lock, all keyed alike.
- B. Branch-Circuit Breakers: Where overcurrent protective devices are indicated to be circuit breakers, use bolt-on circuit breakers, except circuit breakers 225-A frame size and greater may be plug-in type where individual positive-locking device requires mechanical release for removal.

2.5 OVERCURRENT PROTECTIVE DEVICES

- A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.
 - 1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating as scheduled on drawings.
 - a. Series rating not allowed.
 - 2. Application Listing: Appropriate for application, including Type SWD for switching fluorescent lighting loads and Type HACR for heating, air-conditioning, and refrigerating equipment.
 - 3. Circuit Breakers, 200 A and Larger: Rating plug interchangeable within frame size.
 - 4. Circuit Breakers, 400 A and Larger: Independently field-adjustable instantaneous, short-time, and continuous current settings (LSI).
 - 5. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install panelboards and accessory items according to NEMA PB 1.1. Install panelboards in locations as indicated, according to manufacturer's written instructions. **Verify that the installation location will be readily accessible and will provide the clearances as required by NEC article 110-26(a).**

- B. Mounting Heights: Top of trim 74 inches above finished floor, unless otherwise indicated.
- C. Mounting: Plumb and rigid without distortion of box. Mount flush panelboards uniformly flush with wall finish. For surface mounted panelboards on all wall types; provide 3/4" plywood backboard with two coats of light gray fire-resistant paint. For mounting panelboard where multiple panelboards are installed in one location, plywood sheeting shall be continuous.
- D. Circuit Directory: Type directory to indicate installed circuit loads. Install directory in metal frame. No self-adhesive directories accepted.
- E. Install filler plates in unused spaces.
- F. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.
- G. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties.

3.2 IDENTIFICATION

- A. Identification Plaque: Label each panelboard with self-adhesive, engraved plaque with panelboard name. See Section 26 05 53 "Electrical Identification".

3.3 GROUNDING

- A. Make equipment grounding connections for panelboards as required.
- B. Provide ground continuity to main electrical ground bus as required.

3.4 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

- A. Test as follows:
 - 1. Make insulation-resistance tests of each panelboard bus, component, and connecting supply, feeder, and control circuits.
 - 2. Make continuity tests of each circuit.

3.6 ADJUSTING

- A. Set field-adjustable switches and circuit-breaker trip ranges as required.

3.7 CLEANING

- A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION 26 24 16

SECTION 26 24 20 - SERVICE ENTRANCE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.
- B. Conductors/cables, raceways, and electrical boxes and fittings are specified in Division 26 Sections: "Basic Electrical Materials and Methods", "Conductors and Cables", and "Raceways and Boxes".

1.2 SUMMARY

- A. Extent of service-entrance work is indicated by drawings and schedules.
- B. Types of service-entrance work equipment in this section include the following:
 - 1. Underground service
 - 2. Meter base
 - 3. Main circuit breaker

1.3 CODES AND STANDARDS

- A. NEMA Compliance: Comply with applicable construction and installation requirements of NEMA standards for service-entrance equipment and accessories.
- B. UL Compliance: Comply with construction and installation requirements of the UL standards for service-entrance equipment and accessories.
 - 1. UL 869: Electrical service equipment
- C. Listing and Labeling: Provide service-entrance equipment and accessories which are UL-listed and labeled, and marked, "SUITABLE FOR USE AS SERVICE EQUIPMENT".
- D. IEEE Compliance: Comply with applicable requirements of IEEE Std 241 pertaining to service entrances.

1.4 SEQUENCING AND SCHEDULING

- A. Schedule delivery of service-entrance equipment which permits ready building ingress for large equipment components to their designated installation spaces. Coordinate delivery of equipment with the installation of other building components.
- B. Coordinate with other electrical work including raceways, electrical boxes and fittings, and cabling/wiring work, as necessary to interface installation of service-entrance work with other work.

PART 2 - PRODUCTS

2.1 SERVICE ENTRANCE EQUIPMENT

- A. General: Provide service-entrance equipment and accessories; of types, sizes, ratings and electrical characteristics indicated, which comply with manufacturer's standard materials, design and construction in accordance with published product information, and as required for complete installation; and as herein specified.
- B. Main Circuit Breaker: Provide a main circuit breaker suitable for use as a service-entrance device. Size as scheduled. Interrupting current rating as scheduled.
- C. Cabinet: Panelboard construction - see electrical schedules.
- D. Raceways: Provide raceways complying with Division 26 Section 26 05 33 "Raceways and Boxes", in accordance with the following listing.
 - 1. Metal Conduit, Tubing and Fittings
 - 2. Non-Metallic Conduit and Fittings
- E. Transformer Connection Cabinet: None required.
- F. Transformer Pad: Utilize existing.

2.2 EQUIPMENT

- A. General: Provide equipment for metering in accordance with the rules of the Utility. The Utility's current transformers shall be mounted within the meter. The Utility meter shall be mounted on the building exterior. See electrical plans.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which service-entrance equipment and components are to be installed, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until satisfactory conditions have been corrected in a manner acceptable to Installer.
- B. Provide an underground service from the building to the Utility's pad mounted transformer, and up to the proper height for connection to the secondary lines. Where entering the building, seal the conduits, using Ductseal, or using OZ series CSB fittings. The low point in the service run shall have a drain in each conduit, and there shall be a gravelpocket, at least 24" x 24" x 24", under the conduit at this point. The service connection shall comply with the rules of the Utility. Verify the location of the pad mounted transformer with the Utility before starting this work.

3.2 INSTALLATION OF SERVICE-ENTRANCE EQUIPMENT

- A. Install service-entrance equipment as indicated, in accordance with equipment manufacturer's written instructions, and with recognized industry practices, to ensure

that service-entrance equipment fulfills requirements. Comply with applicable installation requirements of NEC and NEMA standards.

- B. Install circuit breakers in service-entrance equipment.
- C. Tighten electrical connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torque tightening values for equipment connectors. Where manufacturer's torquing requirements are not indicated, tighten connectors and terminals to comply with tightening torques specified in UL Stds 486A and B, and the National Electrical Code.

3.3 FIELD QUALITY CONTROL

- A. Prior to energization, check circuitry for electrical continuity, and for short-circuits.

3.4 GROUNDING

- A. Provide equipment grounding connections for service-entrance equipment as required per NEC article 250. Tighten connections to comply with tightening torques specified in UL Std 486A to assure permanent and effective grounding.

3.5 ADJUSTING AND CLEANING

- A. Adjust operating mechanisms for free mechanical movement.
- B. Touch-up scratched or marred enclosure surfaces to match original finishes.

3.6 DEMONSTRATION

- A. Upon completion of installation of service-entrance equipment and electrical circuitry, energize circuitry and demonstrate capability and compliance with requirements. Where possible, correct malfunctioning units at site, then retest to demonstrate compliance; otherwise, remove and replace with new units, and retest to demonstrate compliance.

END OF SECTION 26 24 20

SECTION 26 27 26 - WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes receptacles, connectors, switches, and finish plates.
- B. Related sections include the following:
 - 1. Division 26 Section 26 05 33 "Raceways and Boxes".

1.3 SUBMITTALS

- A. Shop Drawings: Include product data and drawings showing components for receptacles, connectors, switches, and finish plates.
- B. Maintenance Data: For materials and products to include in maintenance manuals specified in Specification Section 26 01 00 "General Electrical Requirements".

1.4 QUALITY ASSURANCE

- A. Listing and Labeling: Provide products that are listed and labeled for their applications and installation conditions for the environments in which installed.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- B. Comply with NEMA WD 1.
- C. Comply with the 2020 National Electrical Code.

1.5 COORDINATION

- A. Receptacles for Owner-Furnished Equipment: Match plug configurations.
 - 1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Wiring Devices:
 - a. Bryant Electric, Inc.
 - b. Eagle Electric Manufacturing Co., Inc.
 - c. GE Company; GE Wiring Devices
 - d. Hubbell, Inc.; Wiring Devices Div.
 - e. Killark Electric Manufacturing Co.
 - f. Leviton Manufacturing Co., Inc.
 - g. Pass & Seymour/Legrand; Wiring Devices Div.

2.2 RECEPTACLES

- A. Straight-Blade and Locking Receptacles: Heavy-Duty, specification grade, NEMA 5-20R.
- B. GFCI Receptacles: NEMA 5-20R duplex receptacle. Feed through feature shall not be used. Provide GFCI receptacle device for each item labeled, noted, or called out in schedules as GFI on drawings. GFI receptacles used in damp or wet locations (such as exterior applications), shall be weather resistant type. See specification section 26 05 33 for recessed box requirements.

2.3 CORD AND PLUG SETS

- A. Description: Match voltage and current ratings and number of conductors to requirements of equipment being connected.
 1. Cord: Rubber-insulated, stranded-copper conductors, with type SOW-A jacket. Green-insulated grounding conductor, and equipment-rating ampacity plus a minimum of 30 percent.
 2. Plug: Nylon body and integral cable-clamping jaws. Match cord and receptacle type for connection.

2.4 SWITCHES

- A. Snap Switches: Heavy-duty, quiet type, 20 A, 120/277-V ac
- B. Low Voltage Switches: See drawings for specifications.

2.5 WALL PLATES

- A. Single and combination types match corresponding wiring devices.
 1. Plate-Securing Screws: Metal with head color to match plate finish
 2. Material for Finished Spaces: 0.04-inch- thick, Type 302, satin-finished stainless steel
 3. Material for Unfinished Spaces: Galvanized steel

2.6 DEVICE FINISHES

- A. Color: Gray, unless otherwise indicated or required by Code.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install devices and assemblies plumb and secure.
- B. Install wall plates when painting is complete.
- C. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on bottom. Group adjacent switches under single, multi-gang wall plates.
- D. Protect devices and assemblies during painting.
- E. Verify device heights above countertops with architectural elevations and casework details.
- F. Install devices at heights specified in Electrical Symbol Legend or as shown on the drawings. All measurements are to center unless noted otherwise. Device heights indicated in the architectural elevations take precedence over symbol legend.

3.2 CONNECTIONS

- A. Connect branch-circuit equipment grounding conductor to wiring device grounding terminal and device box bonding jumper.
- B. Tighten electrical connectors and terminals according to manufacturers published torque-tightening values. If manufacturers torque values are not indicated, use those specified in UL 486A and UL 486B.
- C. Receptacles and Switches:
 - 1. Where multiple sets of conductors terminate at a box, provide pigtails to devices such that the continuity of the branch circuit conductors is not dependent upon device connections and the continuing load is not routed through the device. See Section 26 05 19 "Conductors and Cables".
 - 2. All unused device terminal screws shall be turned completely in. Provide two full wraps of electrical tape around all device terminals. See Section 26 05 19 "Conductors and Cables".

3.3 FIELD QUALITY CONTROL

- A. Test wiring devices for proper polarity and ground continuity. Operate each device at least six times.
- B. Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.
- C. Replace damaged or defective components.

3.4 CLEANING

- A. Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 26 27 26

SECTION 26 28 13 - FUSES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Fuses.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data for each fuse type required.
- C. Product Data for each fuse type required. Include the following:
 - 1. Descriptive data and time-current curves.
 - 2. Let-through current curves for fuses with current-limiting characteristics.
 - 3. Coordination charts and tables and related data.
- D. Maintenance data for tripping devices to include in the operation and maintenance manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain fuses from one source and by a single manufacturer.
- B. Comply with the 2020 National Electrical Code.
- C. Listing and Labeling: Provide fuses specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

1.5 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
 - 1. Spare Fuses: Provide three of each size and type used on project.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide fuses by one of the following:
 - 1. Cooper Industries, Inc.; Bussmann Div.
 - 2. Tracor, Inc.; Littelfuse, Inc. Subsidiary.

2.2 CARTRIDGE FUSES

- A. Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class as specified or indicated; current rating as indicated; voltage rating consistent with circuit voltage.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine utilization equipment nameplates and installation instructions to verify proper fuse locations, sizes, and characteristics.
- B. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 FUSE APPLICATIONS

- A. Motor Branch Circuits: Class RK1, time delay.

3.3 INSTALLATION

- A. Install fuses in fusible devices as indicated. Arrange fuses so fuse ratings are readable without removing fuse.

3.4 IDENTIFICATION

- A. Install typewritten labels on inside door of each fused switch to indicate fuse replacement information.

END OF SECTION 26 28 13

SECTION 26 28 16 - DISCONNECT SWITCHES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes individually mounted switches used for the following:
 - 1. Equipment disconnect switches
 - 2. Motor disconnect switches
- B. Related Sections: The following Sections contain requirements that relate to this Section:
 - 1. Division 26 Section "Fuses" for fuses in fusible disconnect switches.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
- B. Product Data: For products specified in this section include dimensioned drawings showing front and side views as well as overall dimensions. Ratings of features and components shall also be included. Indicate on each product data sheet which motor/equipment the designated disconnect will be used for. Use motor/equipment name as indicated on the motor/equipment schedule.
- C. Wiring diagrams differentiating between manufacturer-installed and field-installed wiring.
- D. Maintenance data to be included in the operation and maintenance manual.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain disconnect switches from one source and by a single manufacturer.
- B. Comply with the 2020 National Electrical Code for components and installation.
- C. Listing and Labeling: Provide disconnect switches specified in this Section that are listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide disconnect switches by one of the following:
 - 1. Disconnect Switches:
 - a. Eaton Corp.; Cutler-Hammer Products
 - b. General Electric Co.; Electrical Distribution and Control Division
 - c. Siemens Energy & Automation, Inc.
 - d. Square D Co.

2.2 DISCONNECT SWITCHES

- A. Enclosed, Non-fusible Switch: Type HD, handle to be lockable with two padlocks and interlocked with cover in CLOSED position.
- B. Enclosed, Fusible Switch, 800A and Smaller: Type HD with clips to accommodate specified fuses. Handle to be lockable with two padlocks and interlocked with cover in CLOSED position.
- C. Non-fused Rotary Disconnect Switch: Enclosure shall be nonmetallic with gasketed cover. Cover shall be attached to enclosure with hinges. Disconnect switch shall be HP rated with lockable handle capable of accepting two padlocks.
- D. Enclosure: NEMA KS 1, Type 1, unless otherwise specified or required to meet environmental conditions of installed location.
 - 1. Outdoor Locations: Type 3R
 - 2. Other Wet or Damp Indoor Locations: Type 4
- E. All disconnect switches serving motors controlled by variable frequency drives shall be equipped with a set of auxiliary contacts for use in signaling to the drive when the disconnect is in the OPEN position.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install disconnect switches in locations as indicated, according to manufacturer's written instructions. **Verify that the installation location will be readily accessible and will provide the clearances as required by NEC article 110-26(a).**
- B. Install disconnect switches level and plumb.
- C. Install wiring between disconnect switches, control, and indication devices.

- D. Connect disconnect switches and components to wiring system and to ground as indicated and instructed by manufacturer.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- E. Identify each disconnect switch according to requirements specified in Division 26 Section "Electrical Identification."
- F. Terminate equipment grounding conductors within disconnect switch enclosure with UL approved lugs.
- G. Disconnects serving HVAC equipment shall not be mounted directly to equipment unless specifically noted otherwise. Electrical Contractor shall provide Uni-strut framing as necessary to support disconnect independently from equipment being served. Uni-strut framing shall not be located such that access to equipment is blocked. Coordinate exact location with Mechanical Contractor.

3.2 CLEANING

- A. After completing system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, and abrasions.

3.3 IDENTIFICATION

- A. Provide identification labels as specified in Section 26 05 53 for all disconnects. Label as indicated on the plans.

END OF SECTION 26 28 16

SECTION 26 51 00 - INTERIOR LED LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

1.2 SUMMARY

- A. This section includes interior lighting fixtures, LED light sources, drivers, emergency lighting units, and accessories.
- B. Related Sections: The following sections contain requirements that relate to this section:
 - 1. Division 26 Section "Exterior LED Lighting" for exterior security lighting, parking lot lighting, poles and standards.

1.3 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification sections.
- B. Product data describing fixtures, LED light sources, and emergency lighting units. Arrange product data for fixtures in order of fixture designation. Include data on features and accessories and the following:
 - 1. Outline drawings indicating dimensions and principal features of fixtures.
- C. Shop Drawings detailing fixtures and indicating dimensions, weights, method of field assembly, components, features, and accessories. In addition, provide shop drawings on all drivers.
- D. Wiring diagrams detailing wiring for control system showing both factory-installed and field-installed wiring for specific system of this project, and differentiating between factory-installed and field-installed wiring.
- E. Maintenance data for fixtures to include in the operation and maintenance manual specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Electrical Component Standard: Provide components that comply with the 2020 National Electrical Code and that are listed and labeled by UL where available.
- B. Listing and Labeling: Provide fixtures, emergency lighting units, and accessory components specified in this section that are listed and labeled for their indicated use and installation conditions on project.

1. Special Listing and Labeling: Provide fixtures for use in damp or wet locations, and recessed in combustible construction that are specifically listed and labeled for such use.
 2. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.
- C. Coordinate fixtures, mounting hardware, and trim with ceiling system and other items, including work of other trades, required to be mounted on ceiling or in ceiling space.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide the products specified in the Light Fixture Schedule shown on the drawings.

2.2 FIXTURES AND FIXTURE COMPONENTS, GENERAL

- A. Metal Parts: Free from burrs, sharp corners, and edges.
- B. Sheet Metal Components: Steel, except as indicated. Form and support to prevent warping and sagging. Provide paint after fabrication where specified.
- C. Doors, Frames, and Other Internal Access: Smooth operating, free from light leakage under operating conditions. Regressed door frames shall be constructed with extruded aluminum.
- D. Reflecting Surfaces: Minimum reflectance as follows, except as otherwise indicated:
1. White Surfaces: 85 percent
 2. Specular Surfaces: 83 percent
 3. Diffusing Specular Surfaces: 75 percent
 4. Laminated Silver Metallized Film: 90 percent
- E. Lenses, Diffusers, Covers, and Globes: 100 percent virgin acrylic plastic or water white, annealed crystal glass, except as otherwise indicated.
1. Plastic: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 2. Lens Thickness: 0.125 inch minimum; except where greater thickness is indicated.
- F. Fixture Support Components: Comply with Division 26 Section "Basic Electrical Materials and Methods."
- G. LED Lighting:
1. Where indicated on the Light Fixture Schedule, LED fixtures shall utilize a driver capable of being dimmed through industry standard 0-10V signal.
 2. LED lamp life shall be rated at 50,000 hours at a lumen depreciation of 70%. (L70/50,000) minimum.

3. Lumen ratings of the fixture shall be delivered lumens calculated with all lenses and reflectors installed.

H. Exit Signs: Conform to UL 924 and the following:

1. Sign Colors: Conform to local code
2. Minimum Height of Letters: Conform to local code
3. Arrows: Include as indicated
4. Lamps for AC Operation: Light-emitting diodes (LED), 70,000 hours minimum rated life

2.3 LIGHT SOURCES

- A. LED Color Temperature and Minimum Color-Rendering Index (CRI): 4000 K and 82 CRI, except as otherwise indicated.

2.4 FINISHES

- A. Manufacturer's standard, except as otherwise indicated, applied over corrosion-resistant treatment or primer, free of streaks, runs, holidays, stains, blisters, and similar defects.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Set units plumb, square, and level with ceiling and walls, and secure according to manufacturer's written instructions and approved Shop Drawings. Support fixtures according to requirements of Division 26 Section "Basic Electrical Materials and Methods."
- B. Support light fixture whips off of the ceiling with caddy clips or equivalent product.

3.2 CONNECTIONS

- A. Ground Lighting Units: Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3 FIELD QUALITY CONTROL

- A. Inspect each installed fixture for damage. Replaced damaged fixtures and components.
- B. Tests: Verify normal operation of each fixture after fixtures have been installed and circuits have been energized with normal power source. Interrupt electrical energy to verify proper operation of emergency lighting installation.
- C. Replace or repair malfunctioning fixtures and components, then retest. Repeat procedure until all units operate properly.
- D. Replace fixtures that show evidence of corrosion during project warranty period.

3.4 ADJUSTING AND CLEANING

- A. Clean fixtures after installation. Use methods and materials recommended by manufacturer.
- B. Adjust amiable fixtures to provide required light intensities.

END OF SECTION 26 51 00

SECTION 26 60 42 - COMPUTER AND TELEPHONE OUTLET PROVISIONS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes raceways and boxes for computer, voice and combination voice data outlets.
- B. Related sections include the following:
 - 1. Division 26 Section "Basic Materials and Methods".
 - 2. Division 26 Section "Raceways and Boxes".

PART 2 - PRODUCTS

2.1 COMPUTER OUTLET (See Drawings for Locations):

- A. Provide 1" conduit from 4" x 4" square rough-in box, to data rack location. Provide bushing on conduit end. See detail on drawings.

2.2 FINAL WALL PLATES:

- A. Coordinate with the Owner for single gang or two gang mud rings, depending on wall plates to be provided.
- B. Provide blank stainless steel cover plates for any boxes not used at this time.

PART 3 - EXECUTION

3.1 EQUIPMENT INSTALLATION REQUIREMENTS

- A. Mount all devices at 18" A.F.F. unless shown or noted otherwise.

3.2 CLEANING

- A. Upon completion of installation, inspect interior of junction boxes, remove debris, paint splatters, and other spots, dirt, etc.

END OF SECTION 26 60 42

SECTION 27 15 00 - DATA SYSTEM INFRASTRUCTURE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This section includes installation and testing of wire, cable, connecting devices and equipment racks for wiring system to be used as signal pathways for high-speed data and voice transmission. The work described shall be provided by the Network Communications Contractor (NCC). Installation of high-speed data cabling and any associated terminations in data racks and at the workstation will be the responsibility of this cabling contractor.

1.3 DEFINITIONS

- A. MIS.: Management Information Systems
- B. DMARC: Room or location in building where major external services, including telephone and CATV, enter the building.
- C. LAN: Local Area Network

1.4 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 and 26 Specification Sections.
- B. Shop Drawings Requirements:
 - 1. Product data for each component specified, including detailed manufacturer's specifications. Include data on features, ratings and performance. Include dimensioned plan and elevation views of components. Show access and working-space requirements.
 - 2. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Provide evidence of applicable registration or certification.
 - 3. Maintenance data for products to include in the operation and maintenance manual specified in Divisions 1 and 26.
 - 4. Evidence of listing of products specified to be listed in the "Quality Assurance" article.
 - 5. Provide full size sheet shop drawings showing locations of applicable equipment racks, data, digital media and broadband device locations. All outlet locations shall be shown with identification label designations as required by Part 3.5 – IDENTIFICATION.
 - 6. All riser diagrams, outlets/labeling and locations of equipment shall be done in AutoCAD format. Electronic AutoCAD building plans showing device locations are

available to the NCC for \$100/sheet from EDA. Vendors shall replace EDA generated symbols with their own system symbols and nomenclature on sheets of the same size and scale. Larger scale details of specific areas/rooms are also acceptable. Drawings shall also include all descriptive data on systems and symbol schedule indicating all devices shown on drawings. Shop drawings that do not contain this information as described, will be rejected. See drawing release form at the end of the Division 28 specifications.

- C. Final schedule of cables as specified in Part 3.
- D. Provide a flash drive copy of final comprehensive schedules for the Project in the software and format selected by Owner.
- E. Provide two flash drive copies to the Engineer of final shop drawings reflecting any “as-built” changes to the initial shop drawing submittal. Provide full and/or reduced size printouts of the floor plans to the Owner for posting in the equipment room for future reference. Include reduced size printouts in the O&M manuals.

1.5 STANDARDS, CODES, TESTING LABORATORIES, GUIDELINES

- A. Codes: Comply with applicable sections of the following for interior and exterior installations of wire and cable raceways.
 - 1. Uniform Building Code (UBC)
 - 2. National Electrical Code (NEC/NFPA 70)
 - 3. National Electrical Safety Code (NESC IEEE C 2)
 - 4. Local Codes, amendments, and ordinances.
- B. Copper Standards: Comply with applicable sections of the following for installation and testing of copper twisted-pair communication cabling and connectors.
 - 1. ANSI/EIA/TIA-568-B.1-2001, Commercial Building Telecommunications Cabling Standard, Part 1: General Requirements.
 - 2. ANSI/EIA/TIA-568-B.2-2001, Commercial Building Telecommunications Cabling Standard, Part 2: Balanced Twisted-Pair Cabling Components.
 - 3. ANSI/EIA/TIA-568-B.3-2000, Commercial Building Telecommunications Cabling Standard, Part 3: Optical Fiber Cabling Components Standard.
 - 4. ANSI/EIA/TIA-569-A-1998, Commercial Building Standards for Telecommunications Pathways and Spaces.
 - 5. ANSI/EIA/TIA-570-1991, Residential and Light Commercial Telecommunications Wiring Standard.
 - 6. ANSI/EIA/TIA-606-1993, The Administration Standard for the Telecommunications infrastructure of Commercial Building.
 - 7. ANSI/EIA/TIA-607-1994, Commercial Building Grounding and Bonding Requirements for Telecommunications
 - 8. ANSI/EIATIA TSB-75, Additional Horizontal Cabling Practices for Open Offices.

- C. Listing and Labeling: Provide products specified in this Section shall be listed and labeled.
 - 1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

1.6 QUALITY ASSURANCE

- A. Contractor's Resume: A resume of qualifications shall be submitted with the Contractor's proposal indicating the following:
 - 1. A list of recently completed projects of similar type and size with contact names and telephone numbers for each.
 - 2. A list of test equipment proposed for use in verifying the installed integrity of data, digital media and broadband cable systems on this project.
 - 3. A technical resume of experience for the contractor's Project Manager and on-site installation supervisor who will be assigned to this project.
 - 4. A list of technical product training attended by the contractor's personnel that will install the network communications system shall be submitted with the response.
 - 5. Any sub-Contractor who will assist the primary contractor in performance of this work shall be certified in the work they are performing.
 - 6. A minimum of 33% of the Installers workforce on site should be BICSI Certified Technicians. Of that number, 15% shall be registered at the Technician Level, 30% shall be registered at the Installer Level, and the remaining balance shall be registered at the Apprentice Level. Proof of certification should be included as part of shop drawings submittal. See Section 1.4.
 - 7. The system installer must have a Registered Communications Distribution Designer (RCDD) on staff.
- B. Manufacturer Qualifications: Engage firms experienced in manufacturing components listed and labeled under EIA/TIA-568 and who comply with these Specifications.
 - 1. Installers shall have read the documents listed under Section 1.5 and shall be familiar with the requirements that pertain to this installation. The documents may be obtained from:
 - a. Global Engineering Documents, 15 Inverness Way East, Englewood, CO, 80112-5776, 800-854-7179, fax: 303-397-2.
 - b. IEEE-Institute of Electrical and Electronics Engineers, Inc., 345 East 47th Street, New York, NY, 10017-23945, 800-678-IEEE, fax: 732-981-9667.

1.7 GUARANTEES AND WARRANTIES

- A. A 15-year performance warranty covering all system components, cabling, equipment and workmanship shall be submitted in writing with system documentation. The warranty period shall begin on final acceptance. Should the cabling system fail to perform its expected operation within this warranty period due to inferior or faulty material and/or workmanship, the contractor shall promptly make all required corrections without cost to the Owner.

- B. Service, Manufacturer/Installer shall respond to calls for maintenance and repair with 2 hours. The installer must be able to perform adds, moves and changes within 24 hours.

1.8 COORDINATION

- A. Coordinate Work of this Section with Owner's local area network (LAN) equipment suppliers. Coordinate the service entrance arrangement with Owner's M.I.S. personnel.
 - 1. Meet jointly with representatives of the above organizations and Owner's representatives to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute record to other participants and Engineer. Engineer shall attend coordination meetings upon request.
 - 3. Adjust the arrangements and locations of distribution frames, patch panels, and cross connects in equipment rooms and wiring closets to accommodate and optimize the arrangement and space requirements of all equipment.

1.9 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents. Turn extra materials over to Owner.
 - 1. Cable: 500 feet of category 6 type cable used for Project. Furnish on reels.
 - 2. Patch Panel Units: 1 of each type for each 10 installed, but not less than 1.
 - 3. Cable Connectors: 25 Total
 - 4. Outlet Assemblies: 10 Total

PART 2 - PRODUCTS

2.1 GENERAL WIRING AND SYSTEM REQUIREMENTS

- A. All products shall be new, and delivered to the job site in original manufacturer's packaging.
- B. Initial cable inspection: The Contractor shall visually inspect all cable prior to installation to verify that it is identified properly on the reel identification label, that it is of proper gauge, containing the correct number of pairs, etc. note any buckling of the jacket which would indicate possible problems. Damaged cable, or any other components failing to meet specifications shall not be used in the installation.
- C. Expansion Capability: Unless otherwise indicated, positions in patch panels shall be adequate to accommodate a 20 percent future increase in active workstations.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Cable:
 - a. Mohawk
 - b. General Cable
 - b. Belden Wire & Cable Company
 - c. Optical Cable Corporation
 - d. Berk-Tek
 - e. HCM - Hitachi Cable Manchester Inc.
 - f. Panduit Company

2. Terminal and Connector Components and Distribution Racks:
 - a. Leviton Company - Voice and Data Division. Note that specific Leviton part number are listed. Equivalent devices by manufacturers listed are acceptable.
 - b. Panduit Company - Network Connectivity Group
 - c. Siemens Connectivity
 - d. AMP Interconnect
 - e. Hubbell-Premise
 - f. Optical Cable Corporation
 - g. Ortronics

2.3 GBPS CHANNEL CABLING REQUIREMENTS - DATA SYSTEM

- A. The Gbps 4 pair UTP channel consists of all cable and components with up to four connections to comprise the full 100-meter circuit from the Local Area Network electronics to the work station device. The channel shall include the patch cord, patch panels, horizontal cabling, and the station cord.

- B. The guaranteed Gbps channel cabling performance shall be as follows:
 1. Category 6 UTP plenum rated Cable: UL listed type CMR/CMP, 24 AWG, four pair, solid copper conductors. Cable shall be listed in the UL Verified LAN Cable Products Directory as complying with Category 6 requirements. Cables shall be certified as meeting TIA/EIA-568-B.2-1 Category 6 requirements, and comply with the following minimums when tested to a frequency of 250 MHz:
 - a. Attenuation (Insertion Loss): maximum of 32.6 dB/100 meters
 - b. NEXT Loss: minimum of 43 dB/100 meters
 - c. PS-NEXT Loss: minimum of 41.3 dB/100 meters
 - d. Attenuation to cross talk ratio (ACR): 14.3 dB/100 meters
 - e. PS-ACR: 8.7 dB/100 meters
 - f. Return Loss: 20.5 dB
 - g. Cable shall exceed the Category 6 standard as indicated above. Cable shall be tested up to a frequency of at least 450 MHz.
 - h. Note that this is not the minimally compliant Category 6 cabling. Cable shall have each twisted pair physically separated by the integral plastic cable divider. Cable performance is based on General Cable Gen Speed 6000.

2.4 WIRING PATHWAY AND EQUIPMENT MOUNTING ELEMENTS

- A. General: Installation of raceways/pathways for data systems shall be in accordance with applicable portions of ANSI/EIT/TIA-569-A, Commercial Building Standards for Telecommunications Pathways and Spaces.
- B. Raceways and Boxes: Comply with Division 26 Section "Raceways and Boxes."
- C. Enclosed Wall Mounted Distribution Racks Located in Office 104: Modular steel units designed for data, CATV and voice terminal support.
 - 1. Approximate Module Dimensions: 36" high by 24" deep by 27" wide
 - 2. Finish: Baked polyester powder coat - black
 - 3. Racks shall have 5" deep rear panel with swing out cabinet body for rear access. The cabinet shall be listed to support up to 1,000 pounds of equipment.
 - 4. Provide horizontal cable management systems on the rack for cable management at the cabinet front and rear as required to maintain a clean organized installation.
 - 5. Provide one (1) rack mounted power strip at each rack. Power strip shall have six (6) 20 amp outlets and integral surge suppression.
 - 6. Rack configurations shall be coordinated with the Owner's MIS personal.
 - 7. Provide fan and filter kit for the rack
 - 8. The rack shall have tinted Plexiglas door
 - 9. For the rack at the existing electrical room location, provide Chatswork Products Inc. enclosed, swing out rack model #11900-736.
- D. Install rack mounted patch panels for data cross connect.
 - 1. Provide the quantity of patch panels in each rack, segregated by type and color of connector (i.e. only the same color connectors shall be terminated in the same patch panel.), required to accommodate the number of homerun cables to be terminated in each rack with a minimum of 20% spare capacity for future expansion. Note that patch panels should be provided in quantities of 24 or 48 ports and arranged with horizontal cable management below each respective patch panel See paragraph 3.5 for connector color coding requirements.
 - 2. Provide horizontal cable management with front and rear management on equipment racks above and below each patch panel.
 - 3. All cross connect cables between patch panels and hubs and switches shall be provided by the Contractor.
 - 4. Provide 6" wide vertical cable management on both sides of the rack.
- E. Install plywood backboards at the wall as shown in Office 104 for mounting telephone, data and cable TV equipment.

2.5 INFORMATION OUTLETS AND STATION CABLING FOR DATA GBPS CHANNEL

- A. Listed as Complying with Category 6 of EIA/TIA-568: Provide evidence of listing for all products specified in this Article.
- B. Station Cables:
 - 1. Cable type: 4-pair solid 24AWG Category 6, plenum-rated, Blue jacket.

2. Pull cable from station to patch panel in appropriate rack. See notes on the systems drawings for more information.
3. For data cabling, terminate both ends of cable with Blue Leviton #61110-RL6 8 conductor Category 6 connector. Terminate all cabling according to EIA/TIA T568B wiring scheme:
 - a. Pin Number 1: White/Orange
 - b. Pin Number 2: Orange
 - c. Pin Number 3: White/Green
 - d. Pin Number 4: Blue
 - e. Pin Number 5: White/Blue
 - f. Pin Number 6: Green
 - g. Pin Number 7: White/Brown
 - h. Pin Number 8: Brown
4. Allow eight inches of excess cable at box. Do not wrap excess cable into a tight ball - let it run loose in box.
5. Install station device as specified in electrical details on Electrical Drawings.
6. Label both ends of installed and terminated cable per identification requirements in Section 3.5.

C. Station Patch Cords:

1. Provide manufacturers compatible patch cords, Category 6, 24AWG, polyfin, twisted, blue jacket, with 8-position modular plug on both ends. Patch cords shall be by the approved cable manufacturers.
2. Lengths of patch cords shall comply with EIA/TIA 568A recommended lengths.
3. Contractor shall determine number and appropriate length of cords needed.
4. Number of patch cords shall be 115% of the total number or terminated data outlets. Turn over the 15% spares to the Owner.

2.6 CABLING FOR CLOSED CIRCUIT TV (CCTV) GBPS CHANNEL

- A. Listed as complying with Category 6 of EIA/TIA-568: Provide evidence of listing for all products specified in this Article.

B. Station Cables:

1. Cable type: 4-pair solid 24AWG Category 6, plenum-rated, yellow jacket.
2. Pull cable from station to patch panel in appropriate rack. See notes on the systems drawings for more information.
3. For data cabling, terminate both ends of cable with yellow Leviton model #61110-RY6 8 conductor Category 6 connector. Terminate all cabling according to EIA/TIA T568B wiring scheme:
 - a. Pin Number 1: White/Orange
 - b. Pin Number 2: Orange
 - c. Pin Number 3: White/Green
 - d. Pin Number 4: Blue
 - e. Pin Number 5: White/Blue
 - f. Pin Number 6: Green

- g. Pin Number 7: White/Brown
 - h. Pin Number 8: Brown
- 4. Allow eight inches of excess cable at box. Do not wrap excess cable into a tight ball - let it run loose in box.
 - 5. Install station device as specified in electrical details on Electrical Drawings.
 - 6. Label both ends of installed and terminated cable per identification requirements in Section 3.5.
- C. Station Patch Cords:
- 1. Provide manufacturers compatible patch cords, Category 6, 24AWG, polyfin, twisted, yellow jacket, with 8-position modular plug on both ends. Patch cords shall be by the approved cable manufacturers.
 - 2. Lengths of patch cords shall comply with EIA/TIA 568A recommended lengths.
 - 3. Contractor shall determine number and appropriate length of cords needed.
 - 4. Number of patch cords shall be 115% of the total number or terminated CCTV outlets. Turn over the 15% spares to the Owner.

2.7 WORK TO BE COMPLETED BY THE OWNER'S MANAGEMENT INFORMATION SYSTEMS PERSONNEL (NOTE: The work listed below in this section is for the Contractors reference only and shall not be included in Contractor's scope of work.)

- A. Install hubs and switches.
- B. Install Category 6 patch cables for data cabling system.
- C. Install fiber optic patch cables.

2.8 IDENTIFICATION PRODUCTS

- A. Comply with Division 26 Section "Basic Electrical Materials and Methods".
- B. Comply with Division 26 Section "Electrical Identification".
- C. Cable Labels: Self-adhesive vinyl or vinyl-cloth wraparound tape markers, machine printed with alphanumeric cable designations.
- D. Comply with ANSI/TIA/EIA-606-1993

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine pathway elements to receive cable. Check raceways, cable trays, and other elements for compliance with space allocations, installation tolerances, hazards to cable installation, and other conditions affecting installation. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Wiring Method: Install wiring in raceway and cable tray except within consoles, desks, and counters. Conceal raceway and wiring except in unfinished spaces.
- B. Wiring Method: Use UL-listed plenum cable. Conceal cable and raceway except in unfinished spaces. The station cables shall be installed above accessible ceilings or in EMT conduit stubs per notes on drawings. Power cable must never co-exist in the same cable tray as the data cabling. In suspended ceilings the Contractor shall bundle, in bundles of 15 or less, station wiring with plastic cable ties snug (every 10 ft.), but not deforming the cable geometry. The cable bundling shall be supported via "J" hooks attached to the building structure and framework at a maximum of four (4) foot intervals, if cable tray is not available. Plenum rated cable will be used in all areas. The contractor shall adhere to the manufacturer's requirements for bending radius and pulling tension of all cables.
- C. Install components as indicated, according to manufacturers' written instructions. Use techniques, practices, and methods that are consistent with the Category 6 rating of the components and that assure Category 6 performance of completed and linked signal paths, end-to-end.
- D. Install cable without damaging conductors, shield, or jacket.
- E. Do not bend cable in handling or installation to smaller radii than minimums recommended by manufacturers.
- F. Pull cables without exceeding cable manufacturer's recommended pulling tensions.
 - 1. Pull cables simultaneously where more than one is being installed in the same raceway.
 - 2. Use pulling compound or lubricant where necessary. Use compounds that will not damage conductor or insulation.
 - 3. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips that will not damage media or raceway.
- G. Install exposed cable parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible.
- H. Secure and support cable at intervals not exceeding **30 inches** and not more than **6 inches** from cabinets, boxes, fittings, outlets, racks, frames, and terminals.
- I. Wiring within Wiring Closets and Enclosures: Provide adequate length of conductors. Train the conductors to terminal points with no excess. Use lacing bars to restrain cables, to prevent straining connections, and to prevent bending cables to radii smaller than allowed.
- J. Make splices, taps, and terminations only at indicated outlets, terminals, and cross-connect and patch panels.
- K. Use splice and tap connectors compatible with media types.

3.3 GROUNDING

- A. Comply with Division 26 Section "Grounding."
- B. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common mode returns, noise pickup, cross talk and other impairments.
- C. Bond shields and drain conductors to ground at only one point in each circuit.
- D. Signal Ground Terminal: Locate at each rack. Isolate from power system and equipment grounding.
- E. Install ground buss adjacent to data racks of type, size, location, and quantity as indicated. Comply with installation requirements of Division 26 Section "Grounding."

3.4 INSTALLATION AT OFFICE 104

- A. Provide equipment racks as specified above.
- B. Mount patch panels, terminal strips, and other connecting hardware on equipment racks, except as otherwise indicated.
- C. Group connecting hardware for cables into separate logical fields.
- D. Use patch panels to terminate cables entering the space, except as otherwise indicated.
- E. Provide service loop adequate to reach any point in room.

3.5 IDENTIFICATION

- A. Identify system components in compliance with the applicable requirements of Division 26 Section "Basic Electrical Materials and Methods" and the following specifications:
- B. Identify system components in compliance with the appropriate requirements of Division 26 Section "Electrical Identification" and the following specifications:
- C. Labeling: Station cables, patch panel ports and wall outlet ports must be labeled at both ends for easy identification. Label both the ports and ends of cable. Each item labeled will have source and destination identified. The required labeling format is specified below.
 - 1. Data Station outlets: A data wall outlet can have any number of DATA (Blue) ports. All wireless outlets shall have Purple jacks. All closed circuit camera outlets shall have yellow jacks. The labeling system at each port on a wall outlet should identify the following:

- a. Distribution Frame Source:

<u>Room Name</u>	<u>Label Designation</u>
Office 104	100-200

- b. Wall Outlet ID Number – This will be a four digit number with the first three digits indicating the room number and the remaining digit numbering the data drops within the room.
- c. Examples for a Port Label at Wall Outlet:

- 1) 121 - Label Indicates Data Port #121 fed from Office 104.

- 2. Patch Panel Data Ports: The labeling system at each port on a patch panel shall match the numbering at the workstation end.
- 3. DO NOT: Label anything using the letters I or O.
- 4. The Contractor shall provide documentation in an Excel spreadsheet identifying the cross reference between the patch panel port identification and the wall outlet port identification. Each section of the identifier will be in a separate cell. Contractor shall also provide outlet map showing data drop locations within each room. Data drops shall be identified as indicated above on the map. Provide laminated copies at each data rack.

3.6 FIELD QUALITY CONTROL

- A. Perform the following field tests and inspections and prepare test reports for voice (telephone), computer, spare data and video camera security cabling systems. All UTP testing shall be done with Ideal LANTEK 6 or Fluke DSP4000 Level III Tester.

- 1. All UTP cabling will be certified to meet and or exceed the specifications as set forth in the Link Performance Testing Specifications in the Transmission Performance Specifications For Field Testing Of Unshielded Twisted-Pair Cabling Systems, TIA/EIA 568-B.2-1 for Category 6. Certifications shall include the following parameters for each pair of each cable installed:
 - a. Wire Map (pin to pin Connectivity)
 - b. Length (in Feet)
 - c. Attenuation
 - d. Near End Crosstalk (NEXT)
 - e. Far End Crosstalk (FEXT)
 - f. Equal Level Far End Crosstalk (ELFEXT)
 - g. Attenuation/Crosstalk Ratio (ACR)
 - h. Return Loss
 - i. Propagation Delay
 - j. Delay Skew
 - k. Test equipment shall provide an electronic and printed record of these tests.
 - l. Owner reserves the right to hire an independent testing company to spot check the test results. If the results vary more than 10% from the results provided by the Contractor, the Contractor will be required to prove his results are correct or retest the entire system.
 - m. Power Sum Near End Crosstalk (PSNEXT)
 - n. Power Sum Attenuation to Crosstalk Ratio (PSAXTR)

- o. Power Sum Equal Level Far End Crosstalk (PSELFEXT)
- B. Correct malfunctioning units at site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.
- C. All test reports shall be submitted in paper and electronic form. For the electronic test report submittal, verify software to be used and format of the report with the Owner's representative.

3.7 CLEANING

- A. On completion of system installation, including outlet fittings and devices, inspect exposed finish. Remove burrs, dirt, and construction debris and repair damaged finish, including chips, scratches, and abrasions.

END OF SECTION 27 15 00

SECTION 28 31 11 - FIRE ALARM SYSTEM

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

- A. Extent of fire alarm system work is indicated by the drawings and specifications.
- B. Types of fire alarm system specified in this section include the following:
 - 1. Local Protective Signaling Systems (NFPA 72).
 - 2. Combination, Non-Coded, Addressable.
 - 3. Digital Alarm 911 Communicator Transmitter (DACT).
- C. Provide system suitable for type occupancy as defined by the local Building Code and as approved by the local Fire Marshal.

1.2 CODES AND STANDARDS

- A. NEC Compliance: Comply with applicable requirements of NEC standards pertaining to fire alarm systems.
- B. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to fire alarm systems; and provide products and components which are UL-listed and labeled.

1.3 SUBMITTALS

- A. Product data: Submit manufacturer's technical product data, including specifications and installation instructions, for each type of fire alarm system equipment. Include standard of typical riser and wiring diagrams, and operation and maintenance instructions for inclusion in maintenance manuals.
- B. Shop Drawings: Provide shop drawings showing equipment/device locations and connection wiring of entire fire alarm system. Include floor plans, wiring, riser diagrams and NFPA battery calculations. All riser diagrams and locations of equipment shall be done in AutoCAD format. Electronic AutoCAD building plans showing device locations are available to the fire alarm vendor for \$100. Vendors shall replace EDA generated symbols with their own system symbols and nomenclature on sheets of the same size and scale. Drawings shall also include all descriptive data on system and symbol schedule indicating all devices shown on drawings. Fire alarm shop drawings that do not contain this information as described, will be rejected. See drawing release form at the end of this section.
- C. Submission to Authorities Having Jurisdiction: In addition to submission of the above material, make identical submissions to the authorities having jurisdiction (AHJ) (State Fire Marshal's Office, Des Moines, IA). Upon receipt of comments from the authorities having jurisdiction, submit them for review. Resubmit to the AHJ if required to make clarifications or revisions to obtain approval. Provide any payment required to the Fire Marshal's office for plan review.

- D. Refer Part 3 - Execution, requirements for the fire alarm panel programming of room names and room numbers in conjunction with "As-Built" drawings that will be required for project closeout submittals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide fire alarm systems of one of the following manufacturers:
 - 1. Siemens Cerberus Pro
 - 2. Edwards
 - 3. FCI-Gamewell
 - 4. Notifier; Pitway Corp. Div.
 - 5. Potter

2.2 FIRE ALARM AND DETECTION SYSTEMS

- A. General: Provide complete fire alarm system products of types, sizes, and capacities indicated, which comply with manufacturer's standard design, materials, components; construct in accordance with published product information, and as required for complete installation. Provide fire alarm and detection systems for applications indicated.
- B. Addressable Non-Coded: Either manual activation of fire alarm station or activation of automatic initiating device will energize fire alarm system signaling devices and sound non-coded alarm and provide LCD device/alarm type description on the main and annunciator panel.
- C. Design system for alarm sounding continuously throughout facility.
- D. System wiring and supervision:
 - 1. Provide Class B initiating and alarm circuits with electrical supervision for shorts and open conditions.
 - 2. Power Supplies: Provide system for operation on 120 VAC power supply. Identify circuit breaker with red engraved self-adhesive label. See Section 26 05 53 "Electrical Identification".
 - 3. Provide 24 hour battery back-up as secondary power supply. Design battery back-up to take over supply to system upon loss of primary system to 85% voltage. Provide battery system capable of operation of system under alarm conditions. Battery calculations per the NFPA shall be included in the shop drawing submittals.
- E. Auxiliary Systems, Shunt and Local Energy:
 - 1. Control of auxiliary Services:
 - a. Alarm indication from sprinkler flow switch.
 - b. Trouble indication from sprinkler tamper switches.

2. Equip and wire system so that when energizing fire alarm audible signaling devices, the panel will also activate the following:
 - a. Interior flashing strobe lights.
 - b. Remote annunciator device indication.
 - c. DACT Device - Calls local 911 communications center or local security company (verify with Owner) to indicate "fire alarm" and account number.

- F. Wiring System Materials: Provide basic wiring materials which comply with Division 26 "Basic Electrical materials and Methods" and "Raceways and Boxes"; types to be selected by Installer. Note this is a conduit wired system.
 1. Provide wire and cable in accordance with requirements of manufacturer.
 2. Provide conductors which are listed and approved for fire alarm usage and NEC rated for power limited circuits.
 3. All devices must be supported by appropriate means from t-bar systems of ceilings. Junction boxes tie wired to conduit cross members shall not be allowed. Use products designed for their use.

- G. Control Panels: Provide fire alarm control panel enclosures for housing devices and circuits necessary to perform required functions, to serve as test points and trouble-signal points.
 1. Design devices to be modular, plug-in, supervised for placement.
 2. The control panel shall contain the minimum following features:
 - a. Addressable Points: Provide panel with addressable capacity as necessary to accommodate 150% of quantity of devices as shown on drawings.
 - b. 128 Addressable Points Minimum.
 - c. 2 Alarm Indicating Appliance Circuit
 - d. 20 I/O Points
 - e. 1 (Selectable) Local Energy, Shunt Master Box, or reverse Polarity Remote Station Connection
 - f. 2 Min. Form C Alarm Contacts (2.0 Amps ea.)
 - g. 1 Min. Form C Trouble Contacts (2.0 Amps ea.)
 - h. 1 Earth Ground Supervision Circuit
 - i. 1 Automatic Battery Charger
 - j. 1 set Standby Batteries (24 Hours)
 - k. 1 lot Resident non-volatile programmable operating system memory for all operating requirements
 - l. Control of DACT Device - or integrated with panel per UL and NFPA requirements.

- H. Manual Fire Alarm Stations: Provide manufacturer's ADA compliant and addressable construction, red enclosure, manual fire alarm stations with the following features.
 1. ADA compliant.
 2. Semi-flush mounted.
 3. Addressable.
 4. Two step pull function - non breakglass.
 5. General alarm.

- I. Automatic Fire Detectors: Provide manufacturer's addressable construction automatic fire detectors, of the following types and temperature characteristics. Note: Provide removable devices with separate base. All devices shall be interchangeable with bases.
 - 1. Automatic heat detectors:
 - a. Combination rate of rise and fixed temperature spot type, restorable.
 - b. Fixed high temperature detectors in boiler rooms and attic spaces.
 - c. Mount detector on interchangeable type base, capable of operation on either 2-wire or 4-wire loop.

- J. Automatic Smoke (Combustion Products) Detectors: Provide manufacturer's addressable construction automatic smoke detectors of the following types.
 - 1. Photo electric type, restorable, with LED indicator which flashes on normal operation and changes to steady on alarm condition for operation with voltage indicated. Mount detector on interchangeable type base, capable of operation on either 2-wire or 4-wire loop.
 - 2. Multi Criteria Detector: Located as shown on the drawings, provide a multi criteria detector with photoelectric smoke detection, carbon monoxide detection and thermal detection. Device shall be addressable. Mount detector to a sounder base.

- K. Horns: Provide manufacturer's ADA compliant construction fire alarm horn with following features:
 - 1. ADA Compliant - Red Color.
 - 2. Non-coded.
 - 3. Flush mounted.
 - 4. Minimum 87 dB.
 - 5. Provide weatherproof units where mounted outside.

- L. Alarm Strobe Lights: Provide manufacturer's ADA compliant construction alarm strobe lights with the following features: Provide Candela ratings as required to meet NFPA coverage requirements. Note Candela ratings on shop drawings.
 - 1. ADA Compliant - Red Color.
 - 2. Clear lens, lettered white "FIRE".
 - 3. Flush mounted with horn - combination unit.
 - 4. Ceiling mounted as indicated on plan.

- M. Annunciator: Provide manufacturer's compliant annunciator at the locations shown as RFAAP. Verify final location with local fire chief prior to installation.
 - 1. Serial supervised, two line, 40 character, LCD annunciator with LCD test switch, power "on" indication, audible trouble, keyed switches for trouble silence, alarm silence, system reset, drill reset, drill switch and stainless steel front panel.

- N. System is addressable. Electrical Contractor shall have the fire alarm equipment supplier program panel with all device room name and room number locations. See Part 3 under Execution for requirements.
- O. Provide red self-adhesive engraved label for circuit breaker feeding fire alarm system marked "FIRE ALARM CONTROL CIRCUIT". See electrical identification section 26 05 53.
- P. DACT: Provide "Fire Lite Alarms" or Engineer prior approved equivalent 911 digital alarm communicator transmitter.
 - 1. Connect into building telephone system, make all required connections and provide all programming required.
 - 2. Integrated into panel.
 - 3. Dialer shall communicate with customer selected monitoring service. DACT devices that are not compatible shall be reprogrammed or replaced as necessary by the Contractor.

2.3 EXTRA MATERIALS

- A. In addition to what is shown on the plans, provide the following quantities of additional devices covered in the base bid to be located per the discretion of the Engineer.
 - 1. Smoke Detectors: 5
 - 2. Pull Stations: 2
 - 3. Horns: 2
 - 4. Horns/Strobes: 2
 - 5. Strobes (110CD): 2
- B. These devices will be located after the state review and during the course of the project. Provide all conduit and wiring interconnections with applicable programming.
- C. Devices not used shall be turned over to the Owner for use as spare parts.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions under which fire alarm systems are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

3.2 INSTALLATION OF BASIC WIRING SYSTEM MATERIALS

- A. Install wiring, raceways, and electrical boxes and fittings in accordance with Division 26 "Basic Electrical Materials and Methods", "Conductors and Cables", and "Raceways and Boxes" for wiring of power limited circuits, per NEC Article 760. Note that this is a conduit and raceway wiring system. Refer to this Specification, Section 2.2, Paragraph F. (No exposed fire alarm cabling allowed.)

- B. Install wires and cables without splices. Make connections at terminal strips in cabinets or at equipment terminals. Make soldered splices in electronic circuits in control cabinets.

3.3 FIRE ALARM PANEL PROGRAMMING AND "AS-BUILT" SUBMITTALS

- A. System is addressable. Electrical Contractor shall have the fire alarm equipment supplier program panel with all device room name and number locations.
 - 1. The programming information shall be taken from the Architectural drawings. This programming shall be completed near the building substantial completion in order to enable the entire fire alarm system to be tested and approved by the AHJ to enable building occupancy.
 - 2. Electrical Contractor shall have the fire alarm equipment supplier update the fire alarm shop drawings to reflect the final programming changes. The updated CADD drawings shall also reflect any changes to the wiring diagrams and placement of devices made during the course of construction. Provide to the Engineer two paper copies of the updated drawings and two CD-R copies of the updated drawings in AutoCAD format.

3.4 INSTALLATION OF FIRE ALARM SYSTEMS

- A. Install fire alarm system as indicated, in accordance with equipment manufacturer's written instructions and complying with applicable portions of NEC and NECA's "Standard of Installation."
- B. Coordinate exact location of detectors with mechanical equipment. Do not locate detectors in a direct airflow or closer than 3' from an air supply or return diffuser.
- C. Wiring: Wiring of fire alarm system is work of this section, but is not specifically detailed on drawings.
 - 1. Complete wiring in accordance with manufacturer's requirements. Color code wiring and install per manufacturer's point-to-point wiring diagram. Determine exact number of wires for each fire area zone from number and types of devices installed. Connect each device with sufficient wiring to complete its intended operation.
 - 2. Where there are a number of power requiring devices such as smoke detectors, fan relays, door holders and smoke damper operators installed in a circuit, group in numbers so power required does not exceed 80% of manufacturer's power supply rating. Provide extra wiring, or extra power supplies required to fulfill that requirement. In addition, provide extra or larger size wiring to alleviate voltage drops which makes device operate beyond voltage limits for which it was designed. Determine above with manufacturer's representative while equipment is being installed.
- D. System Test and Approval:
 - 1. Prior to final acceptance of system, manufacturer of system shall in presence of Contractor, Owner's representative and Engineer's representative, test each sensing or detection and alarm device in accordance with NFPA-72.

2. Submit copy of test results in duplicate, after signed by Owner's Representative, to Engineer, Owner, Owner's Insurance Company and local Fire Protection Authority. Mount copy of inspection record in Lexan enclosed frame assembly on control panel.

E. Warranty:

1. The contractor shall warrant the completed fire alarm system wiring and equipment to be free from inherent mechanical and electrical defects for a period of one (1) year from date of the completed and certified test or from the date of the first beneficial use.
2. The equipment manufacturer shall make available to the Owner, a maintenance contract proposal to provide a minimum of two (2) inspections and tests per year in compliance with NFPA-72 guidelines.

END OF SECTION 28 31 11



Engineering Design Associates, Inc.
 385 12th Street, N.E.
 Sioux Center, IA 51250
 Phone: 712-722-0228
 Fax: 712-722-0238
 www.edaengineers.com

To All Persons Requesting Files:

At your request, EDA Inc. will provide electronic files for your convenience and use in the preparation of shop drawings related to **Central Lyon CSD - Bus Barn & Cabinet Replacement**, subject to the following terms and conditions:

Our electronic files are generated with AutoCAD software, EDA Inc. makes no representation as to the compatibility of these files with your hardware or your software. Please advise EDA Inc. of the desired AutoCAD version you are requesting.

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EDA Inc. will furnish your electronic files of the following drawings sheets:

List of Requested Drawings

AutoCAD Version (ie. AutoCAD 2000I, AutoCAD R14, etc.)

\$100.00 Total Service Fee

The service fee as outlined above shall be remitted to EDA Inc. prior to delivery of the electronic files.

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(Contractor/Representative Name and Title)

(E-Mail Address)

SECTION 31 20 00

EARTH MOVING (Bid Package A only)

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:

1. Excavating and filling for rough grading the Site.
2. Preparing subgrades for slabs-on-grade.
3. Excavating and backfilling for buildings and structures.
4. Drainage course for concrete slabs-on-grade.
5. Work required under the following Bid Packages:
 - a. Bid Package A – Bus Barn

- B. **Related Requirements:**

1. Section 00 31 00 – Available Project Information: Geotechnical Soils Investigation Report
2. Section 01 32 16 "Construction Progress Documentation" for recording pre-excavation and earth-moving progress.
3. Section 03 30 00 "Cast-in-Place Concrete" for granular course if placed over vapor retarder and beneath the slab-on-grade.
4. See Civil for earthwork under paving areas.

1.3 UNIT PRICES

- A. Work of this Section is affected by unit prices for earth moving specified in Section 01 22 00 "Unit Prices."
- B. Rock Measurement: Volume of rock actually removed, measured in original position, but not to exceed the following. Unit prices for rock excavation include replacement with approved materials.
 1. 24 inches (600 mm) outside of concrete forms other than at footings.

2. 12 inches (300 mm) outside of concrete forms at footings.
3. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
4. 6 inches (150 mm) beneath bottom of concrete slabs-on-grade.

1.4 DEFINITIONS

- A. Backfill: Soil material or controlled low-strength material used to fill an excavation.
1. Initial Backfill: Backfill placed beside and over pipe in a trench, including haunches to support sides of pipe.
 2. Final Backfill: Backfill placed over initial backfill to fill a trench.
- B. Bedding Course: Aggregate layer placed over the excavated subgrade in a trench before laying pipe.
- C. Borrow Soil: Satisfactory soil imported from off-site for use as fill or backfill.
- D. Drainage Course: Aggregate layer supporting the slab-on-grade that also minimizes upward capillary flow of pore water.
- E. Excavation: Removal of material encountered above subgrade elevations and to lines and dimensions indicated.
1. Authorized Additional Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions as directed by Architect. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
 2. Bulk Excavation: Excavation more than 10 feet (3 m) in width and more than 30 feet (9 m) in length.
 3. Unauthorized Excavation: Excavation below subgrade elevations or beyond indicated lines and dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.
- F. Fill: Soil materials used to raise existing grades.
- G. Rock: Rock material in beds, ledges, unstratified masses, conglomerate deposits, and boulders of rock material that exceed 1 cu. yd. (0.76 cu. m) for bulk excavation or 3/4 cu. yd. (0.57 cu. m) for footing, trench, and pit excavation that cannot be removed by rock-excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting, when permitted:
1. Equipment for Footing, Trench, and Pit Excavation: Late-model, track-mounted hydraulic excavator; equipped with a 42-inch-(1065-mm-)

maximum-width, short-tip-radius rock bucket; rated at not less than 138-hp (103-kW) flywheel power with bucket-curling force of not less than 28,700 lbf (128 kN) and stick-crowd force of not less than 18,400 lbf (82 kN) with extra-long reach boom.

2. Equipment for Bulk Excavation: Late-model, track-mounted loader; rated at not less than 230-hp (172-kW) flywheel power and developing a minimum of 47,992-lbf (213.3-kN) breakout force with a general-purpose bare bucket.
- H. Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.
- I. Subbase Course: Aggregate layer placed between the subgrade and base course for hot-mix asphalt pavement, or aggregate layer placed between the subgrade and a cement concrete pavement or a cement concrete or hot-mix asphalt walk.
- J. Subgrade: Uppermost surface of an excavation or the top surface of a fill or backfill immediately below subbase, drainage fill, drainage course, or topsoil materials.
- K. Utilities: On-site underground pipes, conduits, ducts, and cables as well as underground services within buildings.

1.5 INFORMATIONAL SUBMITTALS

- A. Material Test Reports: For each on-site and borrow soil material proposed for fill and backfill as follows:
1. Classification according to ASTM D 2487.
 2. Laboratory compaction curve according to ASTM D 698.

1.6 SUBMITTALS

- A. Provide copies of record drawings.
- B. Provide samples of each type of soil or aggregate proposed for use on the project. Samples shall consist of a minimum of 50 pounds of soil. The contractor shall be responsible for delivering soil samples to an accredited s testing agency or geotechnical engineering company. Provide samples a minimum of 2 weeks prior to starting construction.

1.7 FIELD CONDITIONS

- A. Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations.
 - 1. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.
 - 2. Provide alternate routes around closed or obstructed traffic ways if required by Owner or authorities having jurisdiction.
- B. Improvements on Adjoining Property: Authority for performing earth moving indicated on property adjoining Owner's property will be obtained by Owner before award of Contract.
 - 1. Do not proceed with work on adjoining property until directed by Architect.
- C. Utility Locator Service: Notify utility locator service for area where Project is located before beginning earth-moving operations.
- D. Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified in Section 015000 "Temporary Facilities and Controls" and Section 311000 "Site Clearing" are in place.
- E. Do not commence earth-moving operations until plant-protection measures specified in Section 015639 "Temporary Tree and Plant Protection" are in place.
- F. The following practices are prohibited within protection zones:
 - 1. Storage of construction materials, debris, or excavated material.
 - 2. Parking vehicles or equipment.
 - 3. Foot traffic.
 - 4. Erection of sheds or structures.
 - 5. Impoundment of water.
 - 6. Excavation or other digging unless otherwise indicated.
 - 7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.
- G. Do not direct vehicle or equipment exhaust towards protection zones.
- H. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones.

1.8 QUALITY ASSURANCE

- A. The Contractor shall retain the services of a geotechnical consulting engineer to conduct sampling testing and analysis as required by this section and elsewhere in the Contract Documents. The geotechnical consulting engineer shall meet the requirements of ASTM E329-00b.
- B. The Contractor's geotechnical consulting engineer shall complete material testing for granular backfill, roadway aggregate, stormwater basin soils and any other requirements as outlined within the provided geotechnical report.

1.9 QUANTITIES

- A. Elevations provided on the plans are finished elevations including topsoil. Finish topsoil depth shall be as shown on the drawings.
- B. Contractor shall be solely responsible for determining all earthwork quantities based on the existing and proposed elevations provided on the plans. Any geotechnical investigations provided by the Owner apply only to those locations that the data was collected, and may not be indicative of conditions elsewhere on the site. The Contractor is responsible for collecting any additional geotechnical or survey data he deems necessary to complete an accurate estimate of earthwork quantities.
- C. Contractor shall be solely responsible for balancing site materials. If onsite excavation and borrow operations do not provide enough suitable material for fill areas, Contractor shall coordinate and pay for excavation, transport and placement of imported material meeting the specifications of the contract documents. If excavation results in excess materials, Contractor shall coordinate and pay for loading, transport and offsite disposal of excess materials.
- D. If contractor finds the geotechnical information or existing or proposed elevations shown on the plans to be erroneous, he shall notify the Owner immediately.

1.10 RECORD DRAWINGS

- A. Maintain as-built drawings showing actual locations of utilities and other features encountered, modifications to proposed grades and site features, and other deviations from the original design.

PART 2 - PRODUCTS

2.1 SOIL MATERIALS

- A. General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
- B. Satisfactory Soils: Soil Classification Groups GW, GP, GM, SW, SP, and SM according to ASTM D 2487, or a combination of these groups; free of rock or gravel larger than 3 inches (75 mm) in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.
 - 1. Liquid Limit: Less than 45
 - 2. Plasticity Index: Less than 22
- C. Unsatisfactory Soils: Soil Classification Groups GC, SC, CL, ML, OL, CH, MH, OH, and PT according to ASTM D 2487 or a combination of these groups.
 - 1. Unsatisfactory soils also include satisfactory soils not maintained within 2 percent of optimum moisture content at time of compaction.
- D. Subbase Material: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- E. Structural Fill: Lean clay material free of organic or other deleterious materials, with maximum particle size of less than 3 inches.
 - 1. Liquid Limit: Less than 45
 - 2. Plasticity Index: Less than 22
- F. Engineered Fill, Granular Fill: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940/D 2940M; with at least 90 percent passing a 1-1/2-inch (37.5-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.
- G. Drainage Course: Narrowly graded mixture of washed crushed stone, or crushed or uncrushed gravel; ASTM D 448; coarse-aggregate grading Size 57;

with 100 percent passing a 1-1/2-inch (37.5-mm) sieve and zero to 5 percent passing a No. 8 (2.36-mm) sieve.

- H. Sand: ASTM C 33/C 33M; fine aggregate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations.
- B. Protect and maintain erosion and sedimentation controls during earth-moving operations.
- C. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.2 DEWATERING

- A. Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area.
- B. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation.
 - 1. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.3 EXPLOSIVES

- A. Explosives: Do not use explosives.

3.4 EXCAVATION, GENERAL

- A. Classified Excavation: Excavate to subgrade elevations. Material to be excavated will be classified as earth and rock. Do not excavate rock until it has been classified and cross sectioned by Architect. The Contract Sum will be adjusted for rock excavation according to unit prices included in the Contract Documents. Changes in the Contract Time may be authorized for rock excavation.
 - 1. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to

be removed; and soil, boulders, and other materials not classified as rock or unauthorized excavation.

- a. Intermittent drilling; blasting, if permitted; ram hammering; or ripping of material not classified as rock excavation is earth excavation.
2. Rock excavation includes removal and disposal of rock. Remove rock to lines and subgrade elevations indicated to permit installation of permanent construction without exceeding the following dimensions:
 - a. 24 inches (600 mm) outside of concrete forms other than at footings.
 - b. 12 inches (300 mm) outside of concrete forms at footings.
 - c. 6 inches (150 mm) outside of minimum required dimensions of concrete cast against grade.
 - d. 6 inches (150 mm)] beneath bottom of concrete slabs-on-grade.

3.5 EXCAVATION FOR STRUCTURES

- A. Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch (25 mm). If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections.
 1. Excavations for Footings and Foundations: Do not disturb bottom of excavation. Excavate by hand to final grade just before placing concrete reinforcement. Trim bottoms to required lines and grades to leave solid base to receive other work.
 2. Excavation for Underground Tanks, Basins, and Mechanical or Electrical Utility Structures: Excavate to elevations and dimensions indicated within a tolerance of plus or minus 1 inch (25 mm). Do not disturb bottom of excavations intended as bearing surfaces.
- B. Excavations at Edges of Tree- and Plant-Protection Zones:
 1. Excavate by hand or with an air spade to indicated lines, cross sections, elevations, and subgrades. If excavating by hand, use narrow-tine spading forks to comb soil and expose roots. Do not break, tear, or chop exposed roots. Do not use mechanical equipment that rips, tears, or pulls roots.
 2. Cut and protect roots according to requirements in Section 015639 "Temporary Tree and Plant Protection."

3.6 SUBGRADE INSPECTION

- A. Notify Architect when excavations have reached required subgrade.

- B. If Architect determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed.
- C. Proof-roll subgrade below the building slabs and pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons (13.6 tonnes) to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades.
 - 1. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph (5 km/h).
 - 2. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Architect, and replace with compacted backfill or fill as directed.
- D. Authorized additional excavation and replacement material will be paid for according to Contract provisions for unit prices.
- E. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Architect, without additional compensation.

3.7 UNAUTHORIZED EXCAVATION

- A. Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi (17.2 MPa), may be used when approved by Architect.
 - 1. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Architect.

3.8 STORAGE OF SOIL MATERIALS

- A. Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 1. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.9 BACKFILL

- A. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, dampproofing, waterproofing, and perimeter insulation.
 2. Surveying locations of underground utilities for Record Documents.
 3. Testing and inspecting underground utilities.
 4. Removing concrete formwork.
 5. Removing trash and debris.
 6. Removing temporary shoring, bracing, and sheeting.
 7. Installing permanent or temporary horizontal bracing on horizontally supported walls.
- B. Place backfill on subgrades free of mud, frost, snow, or ice.

3.10 SOIL FILL

- A. Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material.
- B. Place and compact fill material in layers to required elevations as follows:
1. Under steps and ramps, use structural or engineered fill.
 2. Under building slabs, use drainage course fill and structural or engineered fill.
 3. Under footings and foundations, use structural or engineered fill.
 4. Under stoop slabs use drainage course fill.
- C. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.11 SOIL MOISTURE CONTROL

- A. Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content.
1. Do not place backfill or fill soil material on surfaces that are muddy, frozen, or contain frost or ice.
 2. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

3.12 COMPACTION OF SOIL BACKFILLS AND FILLS

- A. Place backfill and fill soil materials in layers not more than 8 inches (200 mm) in loose depth for material compacted by heavy compaction equipment and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

- B. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.
- C. Compact soil materials to not less than the following percentages of maximum dry unit weight according to ASTM D 698:
 - 1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches (300 mm) of existing subgrade and each layer of backfill or fill soil material at 95 percent.
 - 2. Compact engineered and structural fill to 95 percent of material's standard Proctor maximum dry density

3.13 GRADING

- A. General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated.
 - 1. Provide a smooth transition between adjacent existing grades and new grades.
 - 2. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.
- B. Grading inside Building Lines: Finish subgrade to a tolerance of 1/2 inch (13 mm) when tested with a 10-foot (3-m) straightedge.

3.14 DRAINAGE COURSE UNDER CONCRETE SLABS-ON-GRADE

- A. Place drainage course on subgrades free of mud, frost, snow, or ice.
- B. On prepared subgrade, place and compact drainage course under cast-in-place concrete slabs-on-grade as follows:
 - 1. Place drainage course 6 inches (150 mm) or less in compacted thickness in a single layer.
 - 2. Place drainage course that exceeds 6 inches (150 mm) in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches (150 mm) thick or less than 3 inches (75 mm) thick.
 - 3. Compact each layer of drainage course to required cross sections and thicknesses to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

3.15 FIELD QUALITY CONTROL

- A. Special Inspections: Owner will engage a qualified special inspector to perform the following special inspections:
 - 1. Determine prior to placement of fill that site has been prepared in compliance with requirements.
 - 2. Determine that fill material classification and maximum lift thickness comply with requirements.
 - 3. Determine, during placement and compaction, that in-place density of compacted fill complies with requirements.
- B. Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections.
- C. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements.
- D. Footing Subgrade: At footing subgrades, at least one test of each soil stratum will be performed to verify design bearing capacities. Subsequent verification and approval of other footing subgrades may be based on a visual comparison of subgrade with tested subgrade when approved by Architect.
- E. Testing agency will test compaction of soils in place according to ASTM D 1556, ASTM D 2167, ASTM D 2937, and ASTM D 6938, as applicable. Tests will be performed at the following locations and frequencies:
 - 1. Paved and Building Slab Areas: At subgrade and at each compacted fill and backfill layer, at least one test for every 2000 sq. ft. (186 sq. m) or less of paved area or building slab but in no case fewer than three tests.
 - 2. Foundation Wall Backfill: At each compacted backfill layer, at least one test for every 100 feet (30 m) or less of wall length but no fewer than two tests.
- F. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.16 PROTECTION

- A. Protecting Graded Areas: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

- B. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions.
 - 1. Scarify or remove and replace soil material to depth as directed by Architect; reshape and recompact.
- C. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.
 - 1. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.17 DISPOSAL OF SURPLUS AND WASTE MATERIALS

- A. Transport surplus satisfactory soil to designated storage areas on Owner's property. Stockpile or spread soil as directed by Architect.
 - 1. Remove waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

END OF SECTION

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