



Project Manual for the Construction of:

GRAND LAKE ST. MARYS PARK OFFICE

Auglaize County, Ohio

DNR-250013

October 9, 2025



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State of Ohio Standard Requirements for Public Facility Construction

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END OF DOCUMENT

Document 00 10 00 - Solicitation (General Contracting / Electronic Bid) State of Ohio Standard Requirements for Public Facility Construction

Electronic bids will be received by:

Ohio Department of Natural Resources, Division of Engineering
<https://bidexpress.com>

for the following Project:

Project DNR-250013
Grand Lake St. Marys Park Office
Ohio Department of Natural Resources
Auglaize County

in accordance with the Contract Documents prepared by:

Buehrer Group Architecture & Engineering, Inc.
314 Conant Street, Maumee, Ohio 43537
P: 419.893.9021
F: 419.893.9027
Contact: Michael Rowe
E: michael@buehrergroup.com
www.buehrergroup.com

In compliance with Section 153.08 of the Ohio Revised Code and Section 153:1-8-01 of the Ohio Administrative Code, Bids for this Project are being received, opened, and published through electronic means using the State's electronic bidding service.

To access this Project through the electronic bidding service, you must first register at <https://bidexpress.com> by clicking on the "REGISTER FOR FREE" button and following the instructions. In order to bid, you must create and enable a digital ID within the service. This process requires the submission of notarized paperwork and may take up to five business days to complete. There are no fees to register, create and enable a digital ID, or to download bid documents. There is a small expense on a monthly or per bid basis to submit a bid. The electronic bidding service offers customer support that may be reached at 888.352.2439 or via email at support@bidexpress.com.

Bidders may submit requests for consideration of a proposed Substitution for a specified product, equipment, or service to the Architect/Engineer ("A/E") no later than 10 days prior to the bid opening. Additional products, equipment, and services may be accepted as approved Substitutions only by written Addendum.

From time to time, the Commission issues new editions of the "State of Ohio Standard Requirements for Public Facility Construction" and may issue interim changes. Bidders must submit Bids that comply with the version of the Standard Requirements included in the Contract Documents.

Prevailing Wage rates and Equal Employment Opportunity requirements are applicable to this Project.

This Project is subject to the State of Ohio's Encouraging Diversity, Growth, and Equity ("EDGE") Business Development Program. A Bidder is required to submit with its Bid and with its Bidder's Qualifications form, certain information about the certified EDGE Business Enterprise(s) participating on the Project with the Bidder. Refer to **Section 6.1.10** of the **Instructions to Bidders**.

The EDGE Participation Goal for the Project is **five (5.0) percent**.

The percentage is determined by the contracted value of goods, services, materials, and labor that are provided by EDGE-certified business(es). The participation is calculated on the total amount of each awarded contract. For more information about EDGE, contact the Business Certification Compliance Manager at Stacy.Cornett@development.ohio.gov, or at 77 South High Street, 28th Floor, Columbus, Ohio 43215; or by telephone at (614) 728-0088.

The Bidder may be subject to a Pre-Award Affirmative Action Compliance Review in accordance with Section 123:2-5-01 of the Ohio Administrative Code including a review of the Bidder's employment records and an on-site review.

The Bidder must indicate on the electronic Bid Form, the locations where its services will be performed in the spaces provided or by attachment in accordance with the requirements of Executive Order 2019-12D related to providing services only within the United States and the requirements of Executive Order 2022-02D prohibiting purchases from or investment in any Russian institution or company. Failure to do so may cause the Bid to be rejected as non-responsive.

DOMESTIC STEEL USE REQUIREMENTS AS SPECIFIED IN OHIO REVISED CODE SECTION 153.011 APPLY TO THIS PROJECT. COPIES OF OHIO REVISED CODE SECTION 153.011 CAN BE OBTAINED FROM ANY OF THE OFFICES OF THE OHIO FACILITIES CONSTRUCTION COMMISSION.

Bidders are encouraged to be enrolled in and to be in good standing in a Drug-Free Safety Program (“DFSP”) approved by the Ohio Bureau of Workers' Compensation (“OBWC”) prior to submitting a Bid and provide, on the Electronic Bid Form with its Bid, certain information relative to their enrollment in such a program; and, if awarded a Contract, shall comply with other DFSP criteria described in **Section 1.6** of the **General Conditions**.

Electronic bids will be received for:

<u>Trade</u>	<u>Estimate</u>
General Contract	\$2,287,759
Alternate 1	\$18,070
Alternate 2	\$221,107
Alternate 3	\$30,888
Alternate 4	\$103,039

until **November 6, 2025, at 2:00 p.m.**, when all Bids will be electronically opened. Bid tabulations will be posted no later than 5:00 p.m. on the day Bids are opened.

All Bidders are strongly encouraged to attend the Virtual Pre-Bid Meeting on **October 21, 2025, at 10:00 a.m. until approximately 11:00 a.m.**, at the following link:

Join Zoom Meeting

<https://us06web.zoom.us/j/83150383229?pwd=d5U8n8a0agpkbYkxofrz3l579ZWYIT.1>

Meeting ID: 831 5038 3229

Passcode: 316520

One tap mobile

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The Contractor is responsible for scheduling the Project, coordinating the Subcontractors, and providing other services identified in the Contract Documents.

The Contract Documents may be downloaded as electronic PDF files from the State’s electronic bidding service at <https://bidexpress.com> at no charge.

END OF DOCUMENT

Public Bid Advertisement (Electronic Bidding)

State of Ohio Standard Forms and Documents

DNR-250013
Grand Lake St. Marys Park Office
Auglaize County, Ohio

Bids Due: 2:00 p.m. on November 6, 2025 through the State's electronic bidding system at <https://bidexpress.com>

EDGE Participation Goal: 5.0% of contract

Domestic steel use is required per ORC 153.011.

<u>Contract</u>	<u>Estimated Cost</u>
General	\$2,287,759
Alt 1 Ceramic Tile	\$18,070
Alt 2 Standing Seam Metal Roof Instead of Shingle Roof	\$221,107
Alt 3 Additional Casework and Casework Upgrades	\$30,888
Alt 4 Pedestrian Lighting and Additional Lighting	\$103,039

Pre-bid Meeting: October 21, 2025, at 10:00 a.m. virtually

[Join Zoom Meeting](#)

<https://us06web.zoom.us/j/83150383229?pwd=d5U8n8a0agpkbYkxofrz3l579ZWYIT.1>

Meeting ID: 831 5038 3229

Passcode: 316520

One tap mobile

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+13092053325,,83150383229#,,, *316520# US

Bid Documents: Electronically at <https://bidexpress.com>.

More Info: A/E contact: Michael Rowe, Phone: 419.893.9021, E-mail: michael@buehrergrgroup.com

----- end of advertisement—do not publish this line -----

APPROVED FOR PUBLICATION

In: Wapakoneta Daily News

On: 10/9/25, 10/16/25, 10/23/25

Ohio Department of Natural Resources

Eric Moser
Project Manager

Date

RECEIVED BY:

Type or print name of authorized representative

Signature

Date

Document 00 21 13 - Instructions to Bidders (General Contracting / Electronic Bid)
State of Ohio Standard Requirements for Public Facility Construction

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ARTICLE 1 - GENERAL INSTRUCTIONS

1.1 Applicable Law and Forum

1.1.1 The rights of any Bidder or any party to a subsequent Contract shall be governed by the laws of the state of Ohio and only Ohio courts shall have jurisdiction over any action or proceeding related to the Bid or any subsequent Contract. The Bidder irrevocably consents to such jurisdiction.

1.2 Project Scheduling and Coordination

1.2.1 When the Contract Documents refer to a period of time by a number of days, it excludes the first day and includes the last day of the period. If the last day of the period falls on a Saturday, Sunday, or a legal holiday, that day shall be omitted and the period shall end on the next day which is not a Saturday, Sunday, or legal holiday.

1.2.2 The time for completion of the Project indicated on the electronic **Bid Form** is the time for Substantial Completion of all Work applicable to the Bidder.

1.2.3 The State may assign all or any portion of its interest in a Contract with one or more of the successful Bidders to another successful Bidder as an agreed condition for an award of the Contract for the respective Bid. The assignment may include, without limitation, the duty to schedule, coordinate, and administer the Contract.

1.2.4 The Contractor is responsible for scheduling the Project, coordinating the Subcontractors, and providing other services identified in the Contract Documents.

1.2.5 By submitting its Bid, the Bidder indicates its understanding that the Contract Sum, based on its Bid and as amended by Change Orders, includes all costs that the Contracting Authority owes the Bidder.

1.3 Written Notice

1.3.1 Notice under the Contract Documents shall be validly given if:

1.3.1.1 delivered personally to a member of the organization for whom the notice is intended;

1.3.1.2 delivered, or sent by registered or certified mail, to the last known business address of the organization; or

1.3.1.3 sent by facsimile, email, or web-based project management software, provided the original signed document is delivered within 3 business days after the date of the electronic transmission.

1.3.2 Notices provided to one Project Participant from another shall be simultaneously copied to the prospective Bidders, the Owner, the Contracting Authority, and the A/E.

1.4 Use of the State's Electronic Bidding Software

1.4.1 The Bidder shall use the State's Electronic Bidding Software to submit its Bid for this Project. Paper Bids will not be accepted.

1.4.2 Bidders, Subcontractors, and Material Suppliers may download the Contract Documents as PDF files from the State's Electronic Bidding Software at no charge by registering and associating with a company at <https://bidexpress.com>.

1.4.3 Bidders are encouraged to create and obtain approval of their Digital ID well in advance of the bid deadline. Approval may take up to seven business days.

1.4.4 Bidders are also encouraged to click the “Select for Bidding” link on the electronic **Bid Form** to be listed on the electronic Plan Holder’s list and submit payment to receive notifications regarding Addenda and other announcements.

1.4.5 Subcontractors and Material Suppliers may view the electronic Plan Holder’s list to determine potential Bidders.

1.4.6 Bidders, Subcontractors, and Material Suppliers are encouraged to attend a contractor webinar or contact the vendor’s help desk through the means identified at <https://bidexpress.com> to increase their knowledge of using the State’s Electronic Bidding Software.

ARTICLE 2 - BIDDING PROCEDURES

2.1 Examination of Contract Documents and the Site

2.1.1 Before submitting a Bid, the Bidder shall examine all Contract Documents, including, but not limited to, the Drawings, Specifications, and Addenda for all divisions of Work for the Project, noting in particular all requirements that may affect its Work in any way.

2.1.2 The Bidder’s failure to become acquainted with the extent and nature of Work required to complete any portion of the Work in conformity with the requirements of the Contract Documents, shall not be a basis for additional compensation.

2.1.3 Before submitting a Bid, the Bidder should not only examine and evaluate the Site and related Project conditions where the Work will be performed, but shall also consider when the Work will be performed including, but not limited to, the following:

2.1.3.1 the condition, layout, and nature of the Site and surrounding area;

2.1.3.2 the availability and cost of labor;

2.1.3.3 the availability and cost of materials, supplies, and equipment;

2.1.3.4 the cost of temporary utilities required in the Bid;

2.1.3.5 the cost of any permit or license required by a local or regional authority having jurisdiction over the Project;

2.1.3.6 the usual weather conditions of the Project location;

2.1.3.7 conditions bearing upon transportation, disposal, handling, and storage of equipment, materials, and waste; and

2.1.3.8 subsurface and concealed physical conditions and related information provided in the Contract Documents.

2.2 Pre-Bid Meeting

2.2.1 The Bidder is encouraged to attend the pre-bid meeting, where the A/E, the Contracting Authority, and the Owner will receive questions regarding the Contract Documents. If not given in **Document 00 10 00 - Solicitation**, the A/E shall issue notice of the time and place of any pre-bid meeting to each registered Plan Holder.

2.2.2 The A/E shall prepare minutes of the pre-bid meeting for the Project record. If questions raised by the prospective Bidders require changes to, or clarifications of, the Contract Documents, the A/E shall issue the changes by written Addendum, along with a list of pre-bid meeting attendees.

2.2.3 Additional compensation shall not be based upon the Bidder’s failure to attend the pre-bid meeting, which results in the Bidder’s incomplete knowledge and familiarity of the Project requirements.

2.3 Request for Interpretation

2.3.1 If the Bidder finds any perceived ambiguity, conflict, error, omission, or discrepancy within the Contract Documents, including the Drawings, Specifications, and Addenda, or between any of the Contract Documents and Applicable Law, the Bidder shall submit a written Request for Interpretation (“RFI”) to the A/E for an interpretation or clarification.

2.3.1.1 The Bidder is responsible for prompt delivery of the RFI.

2.3.1.2 The A/E shall respond to RFIs received more than 7 days before the bid opening.

2.3.2 The A/E shall issue Addenda in response to RFIs that modify or clarify the Contract Documents. Any Addenda issued within 72 hours before any bid opening (excluding Saturdays, Sundays, and legal holidays) shall extend the bid opening date by 7 days pursuant to **Section 3.3.1**.

2.3.2.1 The Addenda may be delivered via the State's State's Electronic Bidding Software, facsimile or e-mail, posted to a web or FTP site, or otherwise furnished to each registered Plan Holder.

2.3.3 Any interpretation or clarification of the Contract Documents made by any Person other than the A/E, in any manner other than a written Addendum, shall not be binding, and the Bidder shall not rely upon the interpretation or clarification.

2.3.4 The successful Bidder shall not be compensated for a claim alleging insufficient data, incomplete, ambiguous, conflicting, or erroneous Contract Documents or proposed Contract Documents, or assumed conditions regarding the nature, extent, or character of the Work, if the Bidder did not submit a related RFI prior to the bid opening.

2.4 Basis of Design and Acceptable Components

2.4.1 The Contract Documents may list components produced by specific manufacturers to denote kind, quality, or performance requirements.

2.4.2 The component listed first is the Basis of Design Component.

2.4.3 Other listed components are Acceptable Components.

2.4.3.1 If the Bidder includes an Acceptable Component in its Bid, the Bidder is responsible for the costs of coordination and modification required.

2.5 Substitutions Prior to Bid Opening

2.5.1 If the Bidder proposes to use an article, device, material, equipment, form of construction, fixture, or item other than the Basis of Design or Acceptable Components named in the Specifications, the Bidder shall certify that the proposed item is equal in quality and all aspects of performance and appearance, to the item specified.

2.5.1.1 If approval of a Substitution requires changes to the Contract Documents or affects the work of other trades, the Bidder is responsible for the additional costs, including, but not limited to, changes to the design by the A/E.

2.5.2 The Bidder shall submit its request for Substitution to the A/E no later than 10 days prior to the bid opening, which must include:

2.5.2.1 the name and complete description of the proposed Substitution, including Drawings, performance and test data, and other information necessary for a complete evaluation; and

2.5.2.2 a statement setting forth any changes that the Proposed Substitution will require in the Contract Documents or the Project.

2.5.3 If the A/E approves the Proposed Substitution, the A/E shall issue an Addendum.

2.5.4 If the A/E does not approve the Proposed Substitution, the A/E shall inform the Bidder of its decision, which is final. The A/E may reject a proposed Substitution because the Bidder failed to provide sufficient information to enable the A/E to completely evaluate the Proposed Substitution without causing a delay in the bid deadline.

2.5.5 Proposed Substitutions received by the A/E less than 10 days prior to the bid deadline shall not be considered.

2.6 Electronic Bid Form

2.6.1 Each Bid shall be submitted on the electronic **Bid Form** through the State's Electronic Bidding Software.

2.6.1.1 All sections of the electronic **Bid Form**, including a completed "Bidder Affirmation and Disclosure" section acknowledging that the Bidder affirms, understands, and will abide by the requirements of Executive Order 2019-12D related to providing services only within the United States and Executive Order 2022-02D prohibiting purchases from or investment in any Russian institution or company, and a completed "Commitment to Participate in the EDGE Business Assistance Program" page, shall be submitted with the Bid. Failure to do so may cause the Bid to be rejected as non-responsive.

.1 If the names, locations, and service locations of Subcontractors are not known at the time of the Bid deadline, the Bidder must provide the information requested with its **Subcontractor and Material Supplier Declaration**.

2.6.1.2 Unless the Bidder withdraws the Bid as provided in **Article 4**, the Bidder is required to comply with all requirements of the Contract Documents, regardless of whether the Bidder had actual knowledge of the requirements and regardless of any statement or omission made by the Bidder that might indicate a contrary intention.

2.6.2 The Bidder shall fill in all relevant spaces on the electronic **Bid Form**. The State's Electronic Bidding Software will identify any incomplete required fields.

2.6.3 If the Bidder is a corporation, partnership, or sole proprietorship, an officer, partner or principal of the Bidder shall enter the legal name of the Bidder in the space provided on the electronic **Bid Form**. If the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall enter the legal name of the applicable member in the space provided.

2.7 Allowances

2.7.1 If Allowances are provided on the electronic **Bid Form**, the amount of each Allowance shall be included in the Base Bid amount. Allowances shall be used solely for the purpose of determining the adjustment to the Contract Sum for the difference between the amount of the Allowance and the actual cost of the related Work provided. Allowances shall not include the Contractor's Fee.

2.8 Unit Prices

2.8.1 If Unit Prices are requested on the electronic **Bid Form**, the amount of the scheduled quantities shall be included in the Base Bid amount. Unit prices shall be used solely for the purpose of determining the adjustment to the Contract Sum for the difference between the estimated quantities on the electronic **Bid Form** and the actual quantities provided.

2.8.2 Unit Prices shall include all materials, equipment, labor, delivery, installation, and any other cost or expense, in connection with, or incidental to, the performance of that portion of the Work. Unit Prices shall not include the Contractor's Fee on account of the associated Unit Price Work. The Bidder shall submit Unit Prices for all items listed.

2.9 Alternates

2.9.1 If an Alternate is listed on the electronic **Bid Form**, the Bidder shall fill in the applicable space with a positive or negative bid amount as applicable. The Contracting Authority reserves the right to accept or reject any or all bid amounts for Alternates, in whole or in part, and in any order.

2.9.1.1 If no change in the bid amount is required, indicate "\$0."

2.9.1.2 Failure to make an entry on any Alternate shall cause the Bid to be rejected as non-responsive if that Alternate is selected.

2.9.1.3 Failure to indicate a negative number will indicate the Bidder's intent to increase the Base Bid by the amount entered in the applicable space.

2.9.1.4 If an Alternate is not selected, an entry as listed in **Section 2.9.1.2** on that Alternate shall not, by itself, render a Bid non-responsive.

2.10 Submittals with Electronic Bid Form

2.10.1 The Contracting Authority shall reject a Bid as non-responsive if the Bidder fails to submit the following with the Bid:

2.10.1.1 An electronic facsimile of the Bid Guaranty as provided in **Article 5**, meeting the requirements of Ohio Revised Code ("ORC") Sections 153.54 and 153.571.

2.10.1.2 The original unaltered Bid Guaranty shall be delivered to the Contracting Authority within 3 business days after the public bid opening as provided in Ohio Administrative Code ("OAC") Section 153:1-8-01(H).

2.10.2 If the apparent low Bidder does not submit a valid Power of Attorney of the agent signing for the Surety with its Bid, the Contracting Authority shall direct the apparent low Bidder to deliver a valid and appropriate Power of Attorney to the Contracting Authority within a period determined by the Contracting Authority. The Contracting Authority shall not enter into a Contract without a valid Power of Attorney.

2.10.3 The Bidder is encouraged to submit background information with its Bid using the **Bidder's Qualifications** form and including, but not limited to, the information listed in this **Section 2.10**. If the apparent low Bidder does not submit the **Bidder's Qualifications** form and related information attached to the electronic **Bid Form**, the Bidder shall provide it upon request in accordance with **Section 3.5.4**, including, but not limited to:

2.10.3.1 the overall experience of the Bidder, including number of years in business under present and former business names;

2.10.3.2 a complete listing of all the Bidder's ongoing construction projects and a listing of construction projects which are similar in cost and type to the Project completed by the Bidder in the last 5 years. Include information of

the scope of work and value of each contract, a description of Encouraging Diversity Growth and Equity (“EDGE”) participation and performance, and a project name/contact Person/address/phone number for the owner and the architect or engineer for each project;

2.10.3.3 a Certificate of Compliance with Affirmative Action Programs, issued pursuant to ORC Section 9.47, by the Equal Opportunity Coordinator of the Department of Administrative Services;

2.10.3.4 a complete listing of Affirmative Action and EDGE program violations in the last 5 years;

2.10.3.5 a complete listing of Prevailing Wage, EPA, OSHA, or other regulatory entity issues or violations in the last 5 years;

2.10.3.6 a complete listing of judgments, claims, arbitration proceedings or suits pending or outstanding in the last 5 years;

2.10.3.7 a complete listing of Drug-Free Workplace Program and Drug-Free Safety Program (“DFSP”) violations in the last 5 years;

2.10.3.8 upon request of the Contracting Authority, the apparent low Bidder shall submit the following information, which is not a public record under ORC Section 149.43; and shall remain confidential, except under proper order of a court:

- .1** an annual financial statement prepared within the 12 months prior to the bid opening by an independent licensed accounting firm; and the name, address, contact Person, and phone number of the bank normally used by the Bidder for its primary banking; or
- .2** a financial report generated within 30 days prior to the bid opening from Standard and Poor, Dun and Bradstreet or a similar company acceptable to the Contracting Authority documenting the financial condition of the Bidder; and the name, address, contact Person, and phone number of the bank normally used by the Bidder for its primary banking.

2.10.3.9 a description of the Bidder’s relevant facilities and major equipment, whether leased or owned;

2.10.3.10 a description of the management experience of the Bidder’s project manager(s) and superintendent(s) and a comprehensive resume for each;

2.10.3.11 a description of the EDGE-certified Business Enterprises the Bidder proposes as Subcontractors for this Project by attaching a fully completed **EDGE Affidavit** form for each EDGE-certified Business Enterprise;

2.10.3.12 to support a Bond, a current and signed Certificate of Compliance issued by the Ohio Department of Insurance, showing the Surety is licensed to do business as a surety in Ohio;

2.10.3.13 a current Ohio Workers' Compensation Certificate;

2.10.3.14 if the Bidder is a foreign corporation not incorporated under the laws of Ohio, a Certificate of Good Standing from the Ohio Secretary of State; or, if the Bidder is a foreign person or partnership, evidence that the Bidder filed, with the Ohio Secretary of State, a Power of Attorney designating the Ohio Secretary of State as the Bidder's agent for the purpose of accepting service of summons in any action brought under ORC Section 153.05 or under ORC Sections 4123.01 to 4123.94, inclusive;

2.10.3.15 evidence that the Bidder is enrolled in, and in good standing in, a DFSP approved by the Ohio Bureau of Workers' Compensation (“OBWC”); and

2.10.3.16 any other data or information which the A/E may request concerning the responsibility of the Bidder, including a complete list of major Subcontractors with an estimated contract value of \$200,000 or more, which the Bidder proposes to employ on the Project.

2.11 Changes in the Bid Amount

2.11.1 Any change to a previously submitted Bid shall be resubmitted through the State’s Electronic Bidding Software prior to the deadline for submission of Bids.

ARTICLE 3 - BID OPENING AND EVALUATION

3.1 Delivery of Bid

3.1.1 The Bidder shall submit its Bid to the Contracting Authority prior to the time of the bid deadline.

3.1.2 Bids that are submitted after the time of the bid deadline shall not be considered.

3.2 Bid Opening

3.2.1 Electronic Bids shall be received until the time stated when all Bids shall be electronically opened and the Bid tabulation made public by posting on the State's Electronic Bidding Software.

3.2.2 The posting of Bid tabulations is for informational purposes only and is not to be construed as an acceptance or rejection of any Bid submitted.

3.2.3 The contents of the electronic **Bid Form** and its attachments are public records and shall be available for inspection, upon request, at any time after the bid deadline, except for any information that is not defined as a public record under Ohio law.

3.3 Bid Deadline Extension

3.3.1 If an Addendum is issued within 72 hours prior to the published time for the bid deadline, excluding Saturdays, Sundays and legal holidays, the bid deadline shall be extended 7 days. If the Contracting Authority approves, the bid deadline may be extended for more than 7 days, and consideration for additional advertising may be recommended.

3.3.2 As part of issuing any Addendum earlier than 72 hours prior to the published time for the bid deadline, excluding Saturdays, Sundays and legal holidays, only the Contracting Authority may approve a revised bid deadline or additional advertising.

3.4 Bid Evaluation Criteria

3.4.1 The Contracting Authority reserves the right to accept or reject any or all Bids, in whole or in part, and reserves the right to award the Contract to any remaining Bidder the Contracting Authority determines, in its sole discretion, to have submitted the lowest responsive and responsible Bid.

3.4.2 The Contracting Authority reserves the right to accept or reject any or all Alternates. Alternates may be accepted or rejected in any order.

3.4.3 If any Bidder has engaged in collusive bidding, the Contracting Authority shall reject that Bidder's Bid as non-responsive for the Contract. A collusive bidder may also be debarred from future State Contracts.

3.4.4 The Contracting Authority reserves the right to waive, or to allow any Bidder a reasonable opportunity to cure a minor irregularity or technical deficiency in a Bid, provided the irregularity or deficiency does not affect the bid amount, or otherwise give the Bidder a competitive advantage. Noncompliance with any material requirements of the Contract Documents shall cause a Bid to be rejected as non-responsive.

3.4.5 If, in the opinion of the Owner, the award of the Contract to the lowest Bidder is not in the best interest of the State, with the written consent of the Contracting Authority, the Owner may accept, in its discretion, another Bid so opened, or the Contracting Authority may reject all Bids and advertise for other Bids. The advertisement shall be for the period, in the form, and in the publications directed by the Contracting Authority.

3.5 Bid Evaluation Procedure

3.5.1 The Contract shall be awarded to the lowest responsive and responsible Bidder as determined in the discretion of the Contracting Authority, or all Bids may be rejected in accordance with Applicable Law.

3.5.1.1 In determining which Bid is the lowest, the Contracting Authority shall consider the Base Bid and the bid amounts for any Alternate, or Alternates, which the Owner decides, in its sole discretion, to accept.

3.5.1.2 The total of the bid amounts for the accepted Alternate(s) shall be added to, or deducted from, the Base Bid, as applicable, for determining the lowest Bidder.

3.5.1.3 If two Bidders submit the same bid amount and both are determined to be responsive and responsible, the Contracting Authority may select one Bidder by the flip of a coin, which shall be conducted in the presence of both Bidders and shall be final.

.1 If one of the Bidders refuses to participate in, or fails to be present at, the flip of a coin, the remaining Bidder shall be selected.

3.5.2 A Bidder for a Contract shall be considered responsive if the Bidder's Bid responds to the Contract Documents in all material respects and contains no irregularities or deviations from the Contract Documents that would affect the amount of the Bid or otherwise give the Bidder a competitive advantage.

3.5.2.1 A Bid shall be rejected as non-responsive if the Bid contains a Bid Guaranty executed by a Surety not licensed in Ohio or a Bid Guaranty that is otherwise determined to be insufficient by the Contracting Authority.

3.5.2.2 The Bidder may be subject to a Pre-Award Affirmative Action Compliance Review pursuant to OAC Section 123:2-5-01 including a review of the Bidder's employment records and an on-site review.

- .1** The Bidder must submit the information requested no later than 10 days after receipt of the request. Failure to timely respond to this request for records may result in the Bidder being found non-responsive.

3.5.2.3 If the lowest Bidder is non-responsive, the Bidder shall be notified according to **Section 3.6**.

3.5.3 In determining whether a Bidder is responsible, factors to be considered include, without limitation:

3.5.3.1 preferences required by law, where applicable;

3.5.3.2 the experience of the Bidder;

3.5.3.3 the financial condition of the Bidder;

3.5.3.4 the conduct and performance of the Bidder on previous Contracts, including compliance with Equal Employment Opportunity in the Construction Industry Administrative Rules, OSHA and Prevailing Wage laws, and demonstration of good faith effort to participate in the EDGE Business Development program, or actual participation in the EDGE Business Development program, or both, as indicated in the ORC and the Ohio Administrative Code;

3.5.3.5 the facilities of the Bidder;

3.5.3.6 the management skills of the Bidder, including the capability of the Bidder to construct and manage the entire Project, including but not limited to the plumbing, fire protection, heating, ventilating and air conditioning, and electrical branches or classes of the Work; and

3.5.3.7 the Bidder's ability to execute the Contract properly, including past performance of the Bidder and the Subcontractors that the Bidder proposes to use on the Project.

3.5.4 The A/E shall obtain from the lowest responsive Bidder any information the Contracting Authority determines appropriate to consideration of factors showing responsibility. If the lowest responsive Bidder is responsible, the Contract shall be awarded to that Bidder, unless all Bids are rejected. The Bidder shall provide all requested information within 3 days of a request from the A/E, or a longer period, if the Contracting Authority consents in writing.

3.5.5 If the lowest responsive Bidder is not responsible, the Contracting Authority shall evaluate the next lowest Bidder according to the procedures set forth in this **Section 3.5** until the Contract is awarded, all Bids are rejected, or all responsive Bidders are determined to be not responsible.

3.6 Rejection of Bid

3.6.1 If the lowest Bidder is not responsive or responsible, the Contracting Authority shall reject the Bid and notify the Bidder in writing by Certified Mail of the finding and the reasons for the finding.

3.6.2 Ten Percent Rule.

3.6.2.1 If the lowest responsive and responsible Bid for the Contract, including the Base Bid and accepted Alternates if any, exceeds an amount 10 percent greater than the published Estimated Construction Cost for the Contract, the Contracting Authority shall reject all Bids.

3.6.3 A Bidder notified in accordance with **Section 3.6.1** may object to its rejection by filing a written protest, which must be received by the Contracting Authority within 5 days of the notification provided pursuant to **Section 3.6.1**.

3.6.4 Upon receipt of a timely protest, the Contracting Authority shall meet with the protesting Bidder to hear its objections. ORC Chapter 119 administrative hearing requirements are not applicable to the bid protest meeting.

3.6.4.1 No Contract award shall become final until after the Contracting Authority has met with all Bidders who have timely filed protests and the award of the Contract is affirmed by the Contracting Authority.

3.6.4.2 If all protests are rejected, the Contract shall be awarded to the lowest responsive and responsible Bidder, or all Bids shall be rejected.

3.7 Notice of Intent to Award

3.7.1 The Contracting Authority shall notify the apparent successful Bidder that upon satisfactory compliance with all conditions precedent for execution of the Contract, within the time specified, the Bidder shall be awarded the Contract.

3.7.2 The Contracting Authority reserves the right to rescind any Notice of Intent to Award if the Contracting Authority determines it issued the Notice of Intent to Award in error, or if the conditions precedent for execution of Contract set forth in **Article 6** are not met.

ARTICLE 4 - WITHDRAWAL OF BID

4.1 Withdrawal prior to Bid Opening

4.1.1 A Bidder may withdraw a Bid after submitting the Bid through the State's Electronic Bidding Software, provided the Bidder submits its request through the State's Electronic Bidding Software prior to the bid deadline.

4.2 Withdrawal after Bid Opening

4.2.1 The Bid shall remain valid and open for acceptance for a period of 60 days after the bid opening; provided, however, a Bidder may withdraw a Bid from consideration after the bid opening if the bid amount was substantially lower than the amounts of other Bids, providing the Bid was submitted in good faith, and the reason for the bid amount being substantially lower was a clerical mistake, as opposed to a judgment mistake, and was actually due to an unintentional and substantial arithmetic error or an unintentional omission of a substantial quantity of Work, labor, or material made directly in the compilation of the bid amount.

4.2.1.1 Notice of a request to withdraw a Bid shall be made in writing filed with the Contracting Authority within 2 business days after the bid opening. The Contracting Authority reserves the right to request the Bidder to submit evidence substantiating the Bidder's request to withdraw the Bid.

4.2.1.2 No Bid may be withdrawn under **Section 4.2.1** which would result in awarding a Contract involving the same item on another Bid to the same Bidder.

4.2.2 If a Bidder withdraws its Bid under **Section 4.2.1**, the Contracting Authority may award the Contract to the next lowest responsive and responsible Bidder, or reject all Bids and advertise for other Bids. In the event the Contracting Authority advertises for other Bids, the withdrawing Bidder shall pay the costs, in connection with the re-bidding, of printing new Contract Documents, required advertising, and printing and mailing of notices to prospective Bidders, if the Contracting Authority finds that these costs would not have been incurred but for the withdrawal.

4.2.3 A Bidder may withdraw the Bidder's Bid at any time after the 60-day period described in **Section 4.2.1** by giving written notice to the Contracting Authority.

4.3 Refusal to Accept Withdrawal

4.3.1 If the Contracting Authority contests the right of a Bidder to withdraw a Bid pursuant to **Section 4.2.1**, a hearing shall be held within 10 days after the bid opening and the Contracting Authority shall issue an order allowing or denying the claim of this right within 5 days after the hearing is concluded. The Contracting Authority shall give the withdrawing Bidder timely notice of the time and place of the hearing.

4.3.1.1 The Contracting Authority shall make a stenographic record of all testimony, other evidence, and rulings on the admissibility of evidence presented at the hearing. The Bidder shall pay the costs of the hearing.

4.3.1.2 Pursuant to ORC Section 119.12, the Bidder may appeal the order of the Contracting Authority required by **Section 4.3.1**.

4.4 Refusal to Perform

4.4.1 In the event the Contracting Authority denies the request for withdrawal and the Bidder refuses to perform the Contract, the Contracting Authority may reject all Bids or award the Contract to the next lowest responsive and responsible Bidder.

4.5 Effect of Withdrawal

4.5.1 A Bidder, who is permitted to withdraw a Bid under **Section 4.2.1**, shall not supply material or labor to, or perform a subcontract or other work for, the Person to whom the Contract is awarded; or otherwise benefit, directly or indirectly, from the performance of the Project for which the withdrawn Bid was submitted; without the Contracting Authority's prior written consent.

ARTICLE 5 - BID GUARANTY AND BOND

5.1 Bid Guaranty

5.1.1 The Bidder shall submit a Bid Guaranty with the Bidder's Bid, payable to the Contracting Authority, in the form of either:

5.1.1.1 the signed **Document 00 43 13 - Bid Security Form** contained in the Contract Documents for the amount of the Base Bid plus all additive Alternates; or

5.1.1.2 a certified check, cashier's check, or letter of credit, for 10 percent of the Base Bid, plus all additive Alternates – a letter of credit shall expressly provide that it is revocable only by the Contracting Authority.

5.1.2 The Bid Guaranty shall be in form and substance satisfactory to the Contracting Authority and shall serve as an assurance that upon acceptance of the Bid, the Bidder shall comply with all conditions precedent for Contract execution, within the time specified by the Contracting Authority.

5.1.3 If the blank line on the **Bid Security Form** is not filled in, the penal sum shall be the full amount of the Base Bid plus all additive Alternates. If the blank line is filled in, the amount shall not be less than the full amount of the Base Bid plus all additive Alternates, stated in dollars and cents. A percentage is not acceptable. In the event the blank line is filled in for an amount less than the full amount of the Base Bid plus all additive alternates, the Bid shall be rejected as non-responsive.

5.1.4 An authorized agent must sign the **Bid Security Form**, and the Bidder shall provide a Power of Attorney from the Surety. A Surety authorized by the Ohio Department of Insurance to transact business in Ohio must issue the **Bid Security Form**.

5.1.5 The requirements of ORC Section 3901.86 may be applicable requiring an Ohio resident agent countersign the **Bid Security Form**. The Bidder shall determine the applicability of this provision.

5.1.6 Bid Guaranties in the form of a certified check, cashier's check, or letter of credit shall be returned to unsuccessful Bidders 60 days after the bid opening. Bid Guaranties in the form of a certified check, cashier's check, or letter of credit shall be returned to the successful Bidder upon providing **Document 00 61 13 - Performance and Payment Bond Form** from a Surety satisfactory to the Contracting Authority.

5.2 Forfeiture of Bid Guaranty

5.2.1 If for any reason, other than as authorized by **Section 4.2.1** or **Section 5.3**, the Bidder fails to execute the Agreement, and the Contracting Authority awards the Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder:

5.2.1.1 The Bidder who failed to execute the Agreement is liable to the State for the difference between its Bid and the Bid of the next lowest responsive and responsible Bidder, or for a penal sum not to exceed ten percent of the bid amount, whichever is less.

5.2.2 If the Contracting Authority then awards a Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder and that Bidder fails or refuses to execute the Agreement:

5.2.2.1 The liability of the lowest responsive and responsible Bidder shall be the difference between the bid amount of the lowest responsive and responsible Bidder and another Bidder which the Contracting Authority determines is the lowest responsive and responsible Bidder, except as provided in **Section 5.3**, but not in excess of the liability specified in **Section 4.2.2**.

5.2.2.2 The liability on account of an award to the lowest responsive and responsible Bidder beyond the third lowest responsive and responsible Bidder shall be determined in like manner.

5.2.3 If the Contracting Authority does not award the Contract to another Bidder under **Section 5.2.2**, but submits the Project for re-bidding:

5.2.3.1 The Bidder failing or refusing to execute the Agreement is liable to the State for a penal sum not to exceed 10 percent of the Bidder's bid amount or the costs in connection with the resubmission of printing new Contract Documents, required advertising, and printing and mailing notices to prospective Bidders, whichever is less, except as provided in **Section 5.3**.

5.3 Exception to Forfeiture

5.3.1 A Bidder for a Contract with the State costing less than \$500,000 may withdraw its Bid from consideration if its Bid for another Contract with the State for less than \$500,000 has already been accepted if:

5.3.1.1 the Bidder certifies in good faith that the total amount of its current contracts is less than \$500,000; and

5.3.1.2 the Bidder's Surety certifies in good faith that the Bidder is unable to perform the subsequent Contract because such performance would exceed the Bidder's bonding capacity.

5.3.2 If a Bid is withdrawn pursuant to **Section 5.3.1**:

5.3.2.1 the Contracting Authority may award the Contract to another Bidder which the Contracting Authority determines is the lowest responsive and responsible Bidder or reject all Bids and submit the Project for re-bidding; and

5.3.2.2 neither the withdrawing Bidder nor the Bidder's Surety shall be liable for the difference between the Bidder's Bid and that of the next lowest responsive and responsible Bidder for a penal sum, or for the costs of printing new Contract Documents, required advertising, and printing and mailing notices to prospective Bidders.

5.4 Bond

5.4.1 Prior to signing the Agreement, the Bidder shall provide the Bond required by law in form and substance satisfactory to the Contracting Authority, and from a Surety licensed to do business in the state of Ohio and satisfactory to the Contracting Authority.

5.4.1.1 If the Bidder provided **Document 00 43 13 - Bid Security Form**, described in **Section 5.1.1.1**, as its Bid Guaranty then that form shall be the Bond.

5.4.1.2 If the Bidder provided another form of Bid Guaranty, described in **Section 5.1.1.2**, then **Document 00 61 13 - Performance and Payment Bond Form**, described in **Section 5.1.6**, shall be the Bond.

5.4.1.3 The Bidder shall not be required to provide both forms described above.

5.4.2 The Bond must be in the full amount of the Contract to indemnify the State against all direct and consequential damages suffered by failure of the Contractor to perform according to the provisions of the Contract and in accordance with the Plans, Specifications, details, and bills of material therefore and pay all lawful claims of Subcontractors, Material Suppliers, and laborers for labor performed or materials furnished in performing and completing the Contract.

ARTICLE 6 - CONTRACT AWARD AND EXECUTION

6.1 Conditions Precedent for Execution of Contract

6.1.1 The successful Bidder must submit the items in this **Section 6.1** to the Contracting Authority before executing the Agreement.

6.1.2 Bond, and to support the Bond, a Certificate of Compliance issued by the Ohio Department of Insurance, showing the Surety is licensed to do business in the state of Ohio.

6.1.3 Ohio Workers' Compensation Certificate

6.1.4 Certificate of Compliance with Affirmative Action Programs, issued by the Equal Opportunity Coordinator. The form must be submitted through the Ohio Business Gateway: <http://business.ohio.gov/efiling/>.

6.1.5 Certificate of Insurance (ACORD form is acceptable) and copy of additional insured or loss payee endorsement. The Contracting Authority reserves the right to request and receive a certified copy of the Contractor's insurance policies.

6.1.6 If a Bidder is a foreign corporation (e.g., not incorporated under the laws of Ohio) it must submit a Certificate of Good Standing from the Ohio Secretary of State showing the right of the Bidder to do business in the state of Ohio.

6.1.7 If a Bidder is an individual or partnership, nonresident of the State, it must submit a Power of Attorney designating the Ohio Secretary of State as the Bidder's agent for accepting service of summons in any action brought under ORC Section 153.05 or under ORC Sections 4123.01 to 4123.94, inclusive.

6.1.8 Evidence that the Bidder is enrolled in, and in good standing in, a DFSP approved by the OBWC.

6.1.9 Required Notice of Unresolved Findings for Recovery.

6.1.9.1 By submitting its Bid, the Bidder warrants that it is not subject to an unresolved findings for recovery under ORC Section 9.24. ORC Section 9.24 prohibits the State from awarding a Contract to any Bidder against whom the Auditor of State has issued a finding for recovery if the finding for recovery is unresolved at the time of award. If the Contract is awarded to a Bidder subject to an unresolved finding for recovery under ORC Section 9.24, the Contract is void on its face and the Contractor shall immediately repay to the Owner any funds paid under the Contract.

6.1.10 EDGE Program – Supporting Documentation Required.

6.1.10.1 The Bidder shall provide evidence acceptable to the Contracting Authority of the Bidder's participation in the EDGE Program by contracting with EDGE-certified Business Enterprise(s) for the Project by submitting a fully completed EDGE Affidavit for each EDGE-certified Business Enterprise, by requesting a waiver or partial waiver of the advertised EDGE Program participation goal for the Project on the Bidder's company letterhead including full documentation of the Bidder's good faith effort to contract with EDGE-certified Business Enterprise(s) for this Project, or both.

6.1.11 If the Bidder is a joint venture, it must submit the executed agreement between the joint venturers describing the division of services/work and percentage of contract for each company, and a Power of Attorney which authorizes one or more individuals to bind the joint venture and each individual joint venturer to Contract Modifications.

6.2 Non-compliance with Conditions Precedent

6.2.1 The award of the Contract and execution of the Agreement require the Contractor to comply with:

6.2.1.1 all conditions precedent for execution of the Contract within 10 days of the date of the Notice of Intent to Award; and

6.2.1.2 the **Bidder's Qualifications** form, including a fully completed **EDGE Affidavit** for each EDGE-certified Business Enterprise, not previously provided within 3 business days of receiving the Contracting Authority's request.

6.2.2 Non-compliance with the conditions precedent for execution of the Contract as stated in **Section 6.1** within the timelines stated in **Section 6.2.1** following the date of the Notice of Intent to Award shall be sufficient cause to permit the Contracting Authority to cancel the Notice of Intent to Award, for the Bidder's lack of responsibility and award the Contract to another Bidder, which the Contracting Authority determines is the lowest responsive and responsible Bidder; or the Contracting Authority may re-bid the Work at its sole discretion.

6.2.3 The Contracting Authority may extend the time for complying with the conditions precedent for execution of the Contract for good cause. The extension is not a waiver of the conditions precedent for execution of the Contract.

6.3 Time Limits

6.3.1 The Contracting Authority's failure to award the Contract and execute the Agreement within 60 days of the bid opening invalidates the entire bid process and all Bids submitted, unless the time is extended by written consent of the apparent lowest responsive and responsible Bidder and the Contracting Authority.

6.3.1.1 If the Contracting Authority awards the Contract within 60 days of the bid opening, increases in material, labor, and subcontract costs shall be borne by the Bidder.

6.3.1.2 If failure to execute the Contract within 60 days of the bid opening is due to matters for which the State is solely responsible, the Contractor is entitled to a Change Order authorizing payment of verifiable increased costs in materials, labor, or subcontracts. This increase shall not exceed the difference in price between the successful Bidder and the price of the next lowest responsive and responsible Bidder.

6.3.1.3 If failure to execute the Contract within 60 days of the bid opening is due to matters for which the Contractor is responsible, the Contracting Authority shall not grant a request for increased costs.

6.4 Notice to Proceed

6.4.1 The Contracting Authority shall issue a Notice to Proceed to the Contractor, which establishes the date for commencement and the calendar days allocated for Substantial Completion of all Work. Within 10 days of the date of the Notice to Proceed, or other period as mutually agreed by the Contractor and the Contracting Authority, the Contractor shall furnish the following submittals to the A/E:

6.4.1.1 Schedule of Values;

6.4.1.2 preliminary schedule of Shop Drawings and other Submittals;

6.4.1.3 Subcontractor and Material Supplier Declaration form, with completed “Bidder Affirmation and Disclosure” forms acknowledging that the Contractor affirms, understands, and will abide by the requirements of Executive Order 2019-12D and Executive Order 2022-02D for Subcontractors that were not identified in the electronic **Bid Form**;

6.4.1.4 qualifications of proposed project manager(s) and superintendent(s) and a comprehensive resume of each; and

6.4.1.5 evidence that an authorization agreement for automatic deposit of state warrants has been submitted to Ohio Shared Services using the electronic funds transfer form provided on the Internet at <http://supplier.ohio.gov>.

6.5 Prevailing Wage Rates

6.5.1 The Bidder shall base its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.14. Refer to **Document 00 73 43 - Wage Rate Requirements** for related information and the Project’s prevailing rates of wages with an appropriate ratio of registered apprentices.

6.5.2 The Bidder shall not be entitled to an increase in the Contract Sum on account of an increase in prevailing wage rates, except as otherwise provided by Applicable Law. The Bidder is responsible for compliance of its Subcontractors with prevailing wage requirements.

6.5.3 Within 10 days of the date of the Notice to Proceed, the Contractor shall provide the Contracting Authority’s Prevailing Wage Coordinator with a schedule of dates during the term of the Contract when the Contractor shall pay wages to its employees for the Project.

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Document 00 22 00 - Supplementary Instructions

State of Ohio Standard Requirements for Public Facility Construction

Certifications

These Supplementary Instructions amend and supplement the Instructions to Bidders and other provisions of the Contract Documents as indicated below. All provisions not amended remain in full force and effect. The terms in these Supplementary Instructions defined in the Contracting Definitions or the Instructions to Bidders shall have the meanings assigned to them in those documents.

These Supplementary Instructions are authorized, by the Ohio Facilities Construction Commission, for use on projects constructed by [Ohio Department of Natural Resources](#).

Contracting Authority

[Ohio Department of Natural Resources](#)
2045 Morse Road E-3
Columbus, OH 43229
614-265-6948
<http://engineering.ohiodnr.gov>

MODIFICATIONS TO INSTRUCTIONS TO BIDDERS

Replace Section 2.7.1 with the following:

2.7.1 If Allowances are provided on the electronic **Bid Form**, the amount of each allowance will be automatically added to the Bid Total. Allowances shall not include the Contractor's Fee.

Replace Section 2.8.1 with the following:

2.8.1 If Unit Prices are requested on the electronic **Bid Form**, the amount of each unit prices will automatically be added to the Bid Total.

Replace Section 2.8.2 with the following:

2.8.2 Unit Prices shall include all materials, equipment, labor, delivery, installation and any other cost or expense, in connection with, or incidental to, the performance of that portion of the Work. The Bidder shall submit Unit Prices for all items listed.

In Section 2.9.1.3 replace "Base Bid" with "Bid Total".

In Section 3.5.1.1 replace "Base Bid" with "Bid Total".

In Section 3.5.1.2 replace "Base Bid" with "Bid Total".

In Section 3.6.2 replace "Base Bid" with "Bid Total".

In Section 5.1.1.2 replace "Base Bid" with "Bid Total".

In Section 5.1.3 replace all instances of "Base Bid" with "Bid Total".

END OF DOCUMENT

EXISTING HAZARDOUS MATERIAL INFORMATION

1. PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. General
- B. Supplementary Conditions, Abatement
- C. Project Identification and Scope of Work, Abatement
- D. Abatement Technical Specifications

1.2 GENERAL

- A. This work is subject to the provisions of the Contract Document as they pertain to and affect the work specified in this section.

1.3 SUPPLEMENTARY CONDITIONS, ABATEMENT

- A. **REQUIREMENTS:** Refer to the Instructions to Bidders, General Conditions, and the Specifications. The following requirements of the Supplementary Conditions, Abatement, when not in agreement, take precedent over the requirements of Instructions to Bidders and General Conditions which are a part of this Contract.
- B. **ABATEMENT CONTRACTOR QUALIFICATIONS:** To demonstrate qualifications to perform the Work, the abatement contractor must provide evidence of the following:
 - 1) Evidence of current status as an Ohio Asbestos Abatement Contractor.
 - 2) Evidence of required insurance coverage.
- C. **SITE SECURITY**
 - 1) During Abatement activities, the Contractor is responsible for barricades, signs, and warnings such that a reasonable person would be aware that they should not enter the regulated area.
- D. **EMPLOYEE CONDUCT**
 - 1) All of the Contractor's employees shall abide by Federal, State, and Local laws while on the work site.
 - 2) No employee of the Contractor shall fraternize with any employee of the Owner during work hours.
 - 3) Employees of the Contractor are restricted to only those areas of the building directly impacted by the project.

E. PROJECT COORDINATION

- 1) No other Contractors will be allowed in the asbestos work areas until the removal is completed.
- 2) The Asbestos Contractor shall coordinate with the Owner the work schedule and staging of the work areas.

F. STOP WORK ORDER

- 1) The Owner is authorized to issue a "Stop Work Order" to the Contractor at any time it is determined that the Contractor's work practices have compromised (or may compromise) the health and/or safety of any individual or the Owner's facility; or if the work is persistently and substantially in violation of the Specifications.

1.4 PROJECT IDENTIFICATION, SUMMARY, AND SCOPE OF WORK

A. PROJECT IDENTIFICATION

B. PROJECT LOCATION: Grand Lake ODNR Offices
St. Mary's, OH

C. PROJECT DESIGNER: Castle Hill Associates, LLC
Phone: 419-708-7680
Contact: Brett Brumbaugh – Project Designer
OEPA Certification: AHPD #PD60095

D. STRUCTURES:

- 1) Park Office Building
 - a) No Asbestos Materials Identified
- 2) Check Out Building:
 - a) ASBESTOS MATERIAL LOCATIONS QUANTITY
 - [1] Brown Floor tile Throughout interior of Check out bldg
1000 SF
 - [2] Window Glazing Check out window of bldg
10 SF

E. INSPECTION FINDINGS - LEAD and TCLP

- 1) Park Office Bldg
 - a) XRF Inspection: No building components found to be lead containing

- b) TCLP Test: Building component TCLP Test found to be non-hazardous
- 2) Check Out Bldg
 - a) XRF Inspection: Porch columns found to be greater than 1 ppm
 - b) TCLP Test: Building component TCLP Test found to be non-hazardous

F. INSPECTION FINDINGS - HAZARDOUS MATERIALS

- 1) Park Office Bldg
 - a) The following hazmats should be containerized and removed prior to bldg demolition
 - [1] 22 fluorescent light tubes and associated light fixtures
 - [2] Small cache of office cleaning supplies
 - [3] 1 thermostat
 - [4] 1 fire extinguisher
 - [5] 1 large HVAC unit (back of bldg outside)
 - [6] Computer and electronic devices
 - [7] One drinking fountain
- 2) Check Out Bldg
 - a) The following hazmats should be containerized and removed prior to bldg demolition
 - [1] 6 fluorescent light tubes and associated light fixtures
 - [2] Small cache of office cleaning supplies
 - [3] 1 thermostat
 - [4] 1 fire extinguisher
 - [5] 1 soda pop fridge
 - [6] 1 ice cream cooler

G. SCOPE OF WORK:

- 1) Provide all labor and material for the asbestos abatement of the following materials prior to demolition:

Check Out Bldg			
ASBESTOS MATERIALS	LOCATIONS	EPA NESHAP ASSESSMENT	QUANTITY
Brown 9" Floor tile	Throughout structure	RACM (Category 1 non-friable asbestos in poor condition)	1000 sf
Window Glazing/caulking	Throughout structure	RACM (Category 1 non-friable asbestos in poor condition)	20 sf

- 2) Lead Based Paint

- a) Check Out BLDG

- [1] The Check out bldg porch columns were found to be lead paint via XRF Technology. Lead painted bldg components are not required to be removed prior to bldg demolition. The lead painted components are not required to be removed prior to demolition/renovation and can remain in-place indefinitely. The Occupational Safety & Health Administration (OSHA) regulates workers exposure to lead paint concentrations in any amount, therefore, in order to satisfy OSHA requirements, worker protection and monitoring may be required for work activities that disturb paints that contain lead in any amount. In accordance with the OSHA Construction Standard for Lead (29 CFR 1926.62), it is the contractors' responsibility to protect their workers when an employee may be occupationally exposed to lead.
 - [2] Hazardous building apparatus, items and materials should be removed and appropriately recycled or disposed of by a trained and competent firm. The following materials should be removed prior to bldg demolition/renovation.

- b) Park Office Bldg

- [1] The following hazmats should be containerized and removed prior to bldg demolition
 - [a] 22 fluorescent light tubes and associated light fixtures
 - [b] Small cache of office cleaning supplies

- [c] 1 thermostat
- [d] 1 fire extinguisher
- [e] 1 large HVAC unit (back of bldg outside)
- [f] Computer and electronic devices
- [g] One drinking fountain

c) Check Out Bldg

- [1] The following hazmats should be containerized and removed prior to bldg demolition

- [a] 6 fluorescent light tubes and associated light fixtures
- [b] Small cache of office cleaning supplies
- [c] 1 thermostat
- [d] 1 fire extinguisher
- [e] 1 soda pop fridge
- [f] 1 ice cream cooler

2. PART 2 – PRODUCTS

- 2.1 All Abatement related products and equipment shall be at minimum compliant with EPA and State of Ohio Asbestos abatement regulations and requirements.

3. PART 3 – EXECUTION ASBESTOS AND UNIVERSAL HAZMAT REMOVAL PROCESS

Note: The Check out bldg porch columns were found to be lead paint via XRF Technology. Lead painted bldg components are not required to be removed prior to bldg demolition. The lead painted components are not required to be removed prior to demolition/renovation and can remain in-place indefinitely. The Occupational Safety & Health Administration (OSHA) regulates workers exposure to lead paint concentrations in any amount, therefore, in order to satisfy OSHA requirements, worker protection and monitoring may be required for work activities that disturb paints that contain lead in any amount. In accordance with the OSHA Construction Standard for Lead (29 CFR 1926.62), it is the contractors' responsibility to protect their workers when an employee may be occupationally exposed to lead.

3.1 ASBESTOS ABATEMENT

A. GENERAL REQUIREMENTS

- 1) Potential Asbestos Hazard

- a) The disturbance or dislocation of asbestos-containing materials may cause asbestos fibers to be released into the building's atmosphere, thereby creating a potential health hazard to workers and building occupants. Apprise all workers, supervisory personnel, subcontractors who will be at the jobsite of the seriousness of the hazard and of proper work procedures which must be followed.
 - b) Where in the performance of the work, workers, supervisory personnel, subcontractors, may encounter, disturb, or otherwise function in the immediate vicinity of any identified asbestos-containing materials, take appropriate continuous measures as necessary to protect all building occupants from the potential hazard of exposure to airborne asbestos. Such measures shall include the procedures and methods described herein, and compliance with regulations of applicable federal, state and local agencies.
- 2) Contractor Use of Premises
 - a) Owner shall designate and provide space at the site for the loading and unloading of equipment and project materials.
 - b) Water will be available to the contractor. Sewer facilities to receive properly filtered project waste water will be available. Electric power, 110V, is available for Contractor use.
 - c) Contractor employees are forbidden from smoking on the premises.
- 3) Clean-up
 - a) Contractor or Sub-contractor shall remove from the project site all his waste materials and rubbish resulting from his/her operations. If Contractor fails to clean up within seven (7) days after completion, the Owner may do so and the cost thereof shall be charged to the Contractor as a deduction in the contract price.
- 4) Electrical Safety
 - a) The importance of electrical safety cannot be overemphasized. It is a project requirement that all electrical equipment be powered from circuits that are ground fault circuit interrupter (GFCI or GFI) protected at their source, which must be outside any negative pressure regulated area. Ground fault circuit interrupters are to be supplied by the Contractor.
- 5) Fire Safety

- a) The contractor is to abide by the OSHA fire safety requirements as outlined in 29CFR:1926.24, 1926.150 and 151.
- 6) Site Security
 - a) During asbestos abatement activities, the Contractor is responsible for such barricades, signs and warnings such that a reasonable person would be aware that they should not enter regulated areas.

B. PROJECT COORDINATION

- 1) Description of Work
 - a) Minimum administrative and supervisory requirements necessary for coordination of work on the project include but are not necessarily limited to the following:
 - [1] Supervisory personnel
 - [2] Special reports
 - [3] Contingency plan
 - [4] Submittals
- 2) Administrative and Supervisory Personnel
 - a) Provide a General Superintendent who is experienced in the administration and supervision of asbestos abatement projects including regulations, work practices, protective measures for building and personnel, disposal practices, etc. This person must have had at least two years' experience in asbestos abatement work. This person must meet the 29 CFR 1926.1001 qualifications as Competent Person and the Ohio EPA qualifications as an Asbestos Supervisor.
- 3) Special Reports
 - a) In addition to routine reporting, provide Reports of Unusual Events whenever an event of unusual and significant nature occurs at the site. These are events such as rupture of temporary enclosures, bursting of a water line, etc. Prepare and submit a special report listing the chain of events, persons participating, response by Contractor's personnel, evaluation of results or effects, and similar pertinent information. When such events are known or predictable in advance, advise Owner in advance at the earliest opportunity.
 - b) Prepare and submit Accident Reports for significant accidents at the work site and anywhere else project work is in progress.

Record and document data and actions; comply with industry standards. For this purpose a significant accident is defined to include events where personal injury is sustained, or property loss of substance is sustained, or where the event posed a significant threat of loss or personal injury.

4) Contingency Plan

- a) Prepare a Contingency Plan for emergencies including fire, accident, power failure, negative air system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in the plan specific procedures for decontamination or work area isolation. List the telephone numbers and locations of the emergency services, including but not limited to fire, ambulance, doctor, hospital, police, power company and telephone company. Note that nothing in this specification should impede safe exiting or providing adequate medical attention in the event of an emergency.
- b) Post the Contingency Plan in the clean room of the Personnel Decontamination Unit.

5) Notifications

- a) Notify other entities at the Project Site of the nature of the asbestos abatement activities, location of asbestos containing materials, and requirements relative to asbestos set forth in these specifications and applicable regulations.

6) Permits and Licenses

- a) Contractor is responsible for obtaining such permits as necessary to conduct the work.

7) Submittals Before the Start of Work

- a) Submit the following to the Owner for review and approval:
 - [1] Evidence of satisfactory completion of required training and satisfactory physical exams for all workers for this project.
 - [2] The Action Plan
 - [3] The Contingency Plan
 - [4] Copies of Regulatory Notifications (to be submitted to Owner prior to the start date)

4. PART 4 - CODES AND REGULATIONS

4.1 Description of the Work

- A. This section sets forth governmental regulations and industry standards which are included and incorporated herein by reference and made a part of the specification. This section also sets forth those notices and permits which are known to the Owner and which either must be applied for and received, or which must be given to governmental agencies before start of work.

4.2 Codes & Regulations

- A. General Applicability of Codes, Regulations, and Standards: Except to the extent that more explicit or more stringent requirements are written directly into the Contract documents, all applicable codes, regulations, and standards have the same force and effect (and are made part of the contract documents by reference) as if copied directly into the contract documents, or as if published copies are bound herewith.
- B. Contractor Responsibility: The Contractor shall assume full responsibility and liability for the compliance with all applicable Federal, State, and local regulations pertaining to work practices, hauling, disposal, and protection of workers, visitors to the site, and persons occupying areas adjacent to the site.
- C. The Contractor is responsible for providing medical examinations and maintaining medical records of personnel as required by the applicable Federal, State, and local regulations. The Contractor shall hold the Owner harmless for failure to comply with any applicable work, hauling, disposal, safety, health, or other regulation on the part of himself, his employees, or his subcontractors.
- D. Federal Requirements which govern asbestos abatement work or the hauling and disposal of asbestos waste materials include but are not limited to:
 - 1) Occupational Safety and Health Administration:
 - a) 29 CFR 1910 - General Industry Standards
 - b) 29 CFR 1926 - Construction Industry Standards
 - c) Especially:
 - [1] 29 CFR 1910.20 - Access to Employee Exposure Medical Records
 - [2] 29 CFR 1910.134 - Respiratory Protection
 - [3] 29 CFR 1910.145 - Specifications for Accident Prevention, Signs and Tags
 - [4] 29 CFR 1910.1200 - Hazard Communication

[5] 29 CFR 1926.1101 - Asbestos Standard for Construction
(final rules)

- 2) Environmental Protection Agency:
 - a) 40 CFR 61, Subpart A - National Emission Standard for Hazardous Air Pollutants (NESHAPS)
 - b) 40 CFR 61, Subpart M - NESHAPS Asbestos Regulation
 - c) 40 CFR 763, Subpart E - Asbestos-Containing Materials in Schools
- 3) Department of Transportation:
 - a) 49 CFR 107, et seq. - Hazardous Material Regulations
 - b) 49 CFR 171-180 - Hazardous Material Regulations
- 4) State Requirements which govern asbestos abatement work or the hauling and disposal of asbestos waste materials include but are not limited to:
 - a) Ohio EPA regulations as issued in the Ohio Administrative Code and the Ohio Revised Code.

4.3 Standards

- A. Standards which govern asbestos abatement work or hauling and disposal of asbestos waste materials include but are not limited to:
 - 1) Compressed Gas Association
 - a) Compressed Air for Human Respiration - Pamphlet G-7
 - b) Commodity Specification for Air - Specification G-7.1
 - 2) American National Standards Institute
 - a) American National Standard Practice for Respiratory Protection - ANSI Z88.2-1980

4.4 Notices, State and Local Agencies

- A. Permits: City & County Permits if required.
- B. Licenses: Maintain current licenses as required for the removal, transporting, disposal, or other regulated activity relative to the work of this Contract.

- C. Posting: Post certification cards of all workers and the Supervisor at the site during work hours.

5. PART 5 - PROJECT CLOSE-OUT

5.1 Description of Requirements

- A. This section describes the submissions that will be required from the Contractor before the Work will be considered complete. Requirements for final cleanup, after work area clearance has been achieved, are described.

5.2 Prerequisites to Substantial Completion

- A. Submit the following:

- 1) A copy of the Contractor's project log book, including daily log form and sign in sheets.
- 2) A complete set of copies of Reports of Unusual Events and Accident Reports.
- 3) A record of each Contractor employee working on the project *including* a completed Worker Qualification Form, a copy of the most recent physical examination, Ohio Asbestos Worker or Supervisor Certification Card, AHERA approved training certificates (initial and most recent refresher), and the most recent respirator fit test.
- 4) A complete set of landfill receipts and EPA Waste Manifest forms for each load of asbestos containing waste.
- 5) Copies of any and all regulatory agency notifications, inquiries, complaints, warrants, or any other communications relating to the project from governmental agencies.
- 6) Complete set of Contractor's personal air monitoring records for the project.

5.3 Prerequisites for Final Acceptance

- A. Complete the following for Certification of Final Acceptance, and final payment as required by the General Conditions. List known exceptions, if any, in the request.
- 1) Submit the final payment request with final releases and supporting documentation not previously submitted and accepted.
 - 2) Submit an updated final statement, accounting for final additional changes to the Contract Sum.
 - 3) Submit waivers of lien from every entity (including Contractor) who could lawfully and possibly file a lien arising out of the Contract and related to

work covered by the payment. Owner reserves the right to designate which entities involved in the work must submit waivers.

6. PART 6 - ABATEMENT PROCEDURES

6.1 Related Documents

- A. Drawings, general provisions of the Contract, including General and Supplementary Conditions, and other Specification sections apply to the work of this section.

6.2 Removal of Asbestos Materials

- A. This section describes the procedures that will be used for determining the acceptability of the Work as determined by:
 - 1) Adherence to OSHA Class 1 or Class 2 work procedures
- B. All abatement work must be done in accordance with the OSHA asbestos standard 29 CFR 1926.1101 for Class 1 or 2 asbestos materials.

7. PART 7 - ISOLATION AREAS

7.1 Description of Requirements

- A. The Contractor shall set up the work area isolation/decontamination facilities in accordance with current OSHA regulations.
- B. Class 1 Areas Less Than 25 lf or 10 sf of ACM or any Class 2 removal
 - 1) The Contractor shall set up the work area isolation/decontamination facilities consisting of one equipment room as follows:
 - a) The equipment room or area shall be adjacent to the regulated area for the decontamination of employees and their equipment which is contaminated with asbestos and shall consist of an area covered with an impermeable drop cloth on the floor.
 - b) The equipment area shall be of sufficient size as to accommodate cleaning of equipment and removing personal protective equipment without spreading contamination beyond the area as determined by visible accumulations of dust or debris.
 - c) The disposable work clothing shall be cleaned with a HEPA vacuum before it is removed, then placed immediately in a proper disposal bag and wetted with amended water.
 - d) All equipment and surfaces of containers filled with ACM shall be cleaned prior to removing them from the equipment room or area.

- e) The competent person shall ensure that all employees enter and exit the regulated area through the equipment room or area.

C. Class 1 Areas Greater Than 25 lf or 10 sf of ACM

- 1) A summary of the requirements is as follows:
 - a) The equipment room shall be an area of sufficient size so as to accommodate at least one worker (allowing enough room to remove protective clothing), a 6-mil disposal bag and container, and any equipment which the Contractor wishes to store when not in use.
 - b) The wash room shall have two curtained doorways of opaque polyethylene film, one to the work area and one to the uncontaminated area. At least one shower with shower head supplied with hot and cold water or warm water shall be installed in this room for personnel decontamination. This room shall also be equipped with high pressure, low volume sprays to be used for the decontamination of disposal containers and equipment. The wash room shall be constructed so that all waste water is collected and pumped through a five (5) micron filter system.
 - c) Filtrate shall be disposed of as contaminated waste. From the filter, wastewater shall be drained off in any conventional manner to a sanitary wastewater system. Careful attention shall be paid to the construction of the shower to ensure that it is watertight. No leakage shall be permitted. The Contractor shall supply and maintain soap, shampoo and disposable towels at all times in the shower area.
 - d) The clean room shall be of sufficient size to accommodate at least one worker, towels for the workers, and storage for street clothing. The clean room shall be in the uncontaminated area.
- 2) If the work area isolation structure fails to prevent air flow out of the work area during personnel or equipment movement through the isolation structure, additional air locks shall be installed until air flow is eliminated.

7.2 Construction of Work Area Isolation Structures:

- A. The wash room shall be constructed of 6 mil polyethylene and suitable framing so as to make it as airtight as possible. Where joining separate sheets of polyethylene is necessary, taping alone shall not be sufficient. The sheets of polyethylene shall be overlapped at least 3 inches and joined with an unbroken line of adhesive in such a manner as to prohibit air movement; tape shall then be used to further seal the joint on both the inside and outside of the chamber.
- B. Work area isolation structure shall be constructed to prohibit passers-by from casually observing activities within the work area isolation structure or dressing

areas in the uncontaminated area. The clean room and equipment room shall be constructed to permit workers to privately dress and undress.

- C. Other work area isolation systems shall be considered as long as they maintain the intended integrity of this system. Any proposed changes must be submitted in writing (with drawings) prior to commencement of work and must be approved in writing.

7.3 Maintenance of Isolation Systems and Barriers:

- A. Ensure that barriers are effectively sealed and taped. Repair damaged barriers and remedy defects immediately upon discovery.
- B. Visually inspect all enclosures at the beginning of each work period, and intermittently thereafter.
- C. The negative pressure shall be maintained 24 hours a day, 7 days per week. At no time shall the Contractor allow air to flow from the work area (including periods when asbestos hazard abatement work is not in progress) except through an AFD exhausting HEPA-filtered air outside the building.
- D. The Contractor shall provide local exhaust and ventilation within the work area with the flow of air away from the workers.
- E. Local Exhaust and Ventilation (LEV) means to extract contaminated air from the immediate vicinity of the workers with uncontaminated air, so as to reduce the worker's exposure to concentrations of airborne fiber during the work.

8. PART 8 - EMERGENCY PROTECTION

8.1 Description of Requirements:

- A. Prepare a contingency plan for emergencies including fire, accident, power failure, negative pressure system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in plan specific procedures for decontamination or work area isolation. Note that nothing in this plan should impede safe exiting or providing of adequate medical attention in the event of an emergency.
- B. The Contractor shall establish emergency and fire entrances and exits to work areas. All emergency entrances shall be equipped with two (2) full sets of protective clothing and respirators at all times. The Contractor shall mark all exits from the work area so that they are readily visible in the event of an emergency.
- C. Local medical emergency personnel, both ambulance crews and hospital emergency room staff, shall be notified prior to commencement of asbestos hazard abatement operations as to the possibility of having to handle contaminated or injured workers and shall be advised on safe decontamination.

- D. The Contractor shall be prepared to administer first aid to injured personnel after decontamination. Seriously injured personnel shall be treated immediately or evacuated without delay for decontamination. When an injury occurs, the Contractor shall stop work and implement fiber reduction techniques (e.g., wetting asbestos-containing materials) until the injured person has been removed from the work area.
- E. Before the Contractor begins stripping of the asbestos containing material, the local police and fire department shall be notified as to the dangers of entering the work areas and they shall be invited to attend an informal training program to be conducted by the Contractor which will provide information regarding asbestos hazard abatement activities, decontamination practices, etc. The Contractor shall make every effort to help these agencies form plans of action should their personnel need to enter contaminated areas, and assist during emergency procedures.
- F. The Contractor shall post in the clean room the numbers and locations of emergency services including but not limited to fire, ambulance, doctor, hospital, police, power company, and telephone company.

9. PART 9 - FACILITY PROTECTION

9.1 Description of Requirements

- A. The Contractor shall comply with OSHA and EPA regulations concerning signs and labeling.

9.2 Facility Protection

- A. Existing facilities and functions in adjacent areas may remain in use throughout the asbestos hazard abatement process. All existing services to these adjacent areas shall be maintained throughout this period. All existing fire protection and alarm systems, both within and without the work area, shall be maintained in proper working order throughout the asbestos hazard abatement project.
- B. In the event that any area of the buildings or any area outside the building is contaminated by Contractor activities (except the isolated work areas after asbestos hazard abatement work commences and the disposal landfill), the Contractor shall bear all expenses for determination of the contamination and necessary decontamination as determined by the Owner.

10. PART 10 - DISPOSAL OF ASBESTOS-CONTAINING WASTE MATERIALS

10.1 Description of Requirements

- A. Comply with the multiple codes and regulations which apply to this work.

10.2 Submittals

- A. In addition to the submittals required by regulation, provide to Owners Representative:
 - 1) Prior to the start of work, a copy of the EPA or State asbestos landfill permit.

10.3 Removal Activities

- A. Actual configuration of disposal containers will comply with local EPA District and/or landfill requirements, but as a minimum disposal containers shall be two 6-mil polyethylene bags (one inside the other, both separately sealed).
- B. All polyethylene film, tape, cleaning material, and all other disposable material or items used in the work area shall be treated as contaminated waste.
- C. As disposal containers are filled, they shall be sealed and moved to a staging area adjacent to the work area isolation structure. The Contractor shall remove waste materials from within the work area on a regular basis, and not permit accumulation of disposal containers to obstruct work progress or building exit ways.
- D. Disposal containers may be temporarily stored at the site, outside the work area, if secured in a van-type or semi-trailer truck that is completely and securely lined with polyethylene film, including a curtained doorway at the opening. A similarly sealed, enclosed and locked container is also acceptable.
- E. Disposal containers shall not be loaded so as to make handling unduly difficult or unsafe, or threaten the integrity of the container, polyethylene barriers or building structures.
- F. Warning labels, having waterproof print and permanent adhesive, shall be affixed to the sides of the disposal containers (unless the containers have pre-printed labels). Warning labels shall be conspicuous and legible, and they shall be in accordance with EPA, OSHA and DOT regulations. All disposal bags or containers shall also have the Generator name, address, etc. in accordance with current NESHAP regulations.
- G. All waste disposal containers shall be decontaminated and removed from the work area before final clean-up is started and the isolation barrier is taken down.

11. PART 11 - CONTINGENCY PLAN

11.1 Plan Submittals:

- A. Prepare a Contingency Plan for emergencies including fire, accident, power failure, negative air system failure, supplied air system failure, or any other event that may require modification or abridgment of decontamination or work area isolation procedures. Include in the plan specific procedures for decontamination or work area isolation. List the telephone numbers and locations of the emergency services, including but not limited to fire, ambulance, doctor, hospital,

police, power company and telephone company. Note that nothing in this specification should impede safe exiting or providing adequate medical attention in the event of an emergency. Post the Contingency Plan in the Clean Room or on the job site.

11.2 Notifications

- A. Notify other entities at the Project Site of the nature of the asbestos abatement activities, location of asbestos containing materials, and requirements relative to asbestos set forth in these specifications and applicable regulations.

12. PART 12 - FORMS

12.1 Description of Requirements:

- A. Pursuant to good recordkeeping, final documentation, and job management, the Owner requires the attached forms to be utilized as necessary during the Project.

12.2 Explanation:

- A. Waiver of Liability Form to be completed for each person entering the work area not employed by the Contractor.
- B. Certification of Visual Inspection Form to be completed by the Contractor's Competent Person to verify each cleared area.
- C. Daily Inspection Form to be completed each day for each site.
- D. Worker Qualification Form to be submitted for each Contractor employee working on the site. (Contractor's Form with same information may be substituted.) The form *must* be accompanied by a copy of the most recent physical examination, Asbestos Worker or Asbestos Hazard Abatement Specialist Card, AHERA approved training certificates (initial and most recent refresher), and most recent respirator fit test.
- E. Contractor Personal Air Sampling Form to be submitted with final documents. (Contractor's form with same information may be substituted.)
- F. Contractor Personal Air Sample Log form to be submitted with final documents. (Contractor's form with same information may be substituted.)
- G. Waste Shipment Record (Ohio EPA) to be completed for each load of asbestos material.

ASBESTOS WORKER QUALIFICATION FORM

EMPLOYEE NAME: _____

EMPLOYEE ADDRESS: _____

NAMES OF PERSONS TO CONTACT IN AN EMERGENCY (2 REQUIRED)

Name _____	Relationship _____	Phone _____
Name _____	Relationship _____	Phone _____

MEDICAL EXAMINATION & PULMONARY FUNCTION TEST:

Latest Physical Date _____

Provider _____

ASBESTOS TRAINING PROGRAMS ATTENDED:

Initial Course Provider _____ Date _____

Refresher Course Provider _____ Date _____

EXPERIENCE AND DATES OF ASBESTOS-RELATED WORK:

Project _____ Date _____

Project _____ Date _____

Project _____ Date _____

Do you now have, or have you had, any respiratory problems? YES NO

Have you worked in the past with asbestos or fiberglass type materials? YES NO

This project involves the handling, removal, and disposal of asbestos from the building. Asbestos is considered a health hazard.

I certify that my statements and answers are true and that I am familiar with all applicable OSHA, EPA, and State regulations concerning the handling, removal, and disposal of friable asbestos-containing material.

EMPLOYEE SIGNATURE _____ DATE _____

I certify that the above information is true, to the best of my knowledge, and that this worker has had the necessary medical examination and training required for asbestos abatement work.

EMPLOYER SIGNATURE _____ DATE _____

CERTIFICATE OF WORKER'S ACKNOWLEDGMENT

PROJECT NAME: _____ DATE: _____

PROJECT ADDRESS: _____

CONTRACTOR'S NAME: _____

Working with asbestos can be dangerous. Inhaling asbestos fibers has been linked with various types of cancer. If you smoke and inhale asbestos fibers, the chance that you will develop lung cancer is greater than that of the non-smoking public.

Your employer's Contract with the Owner for the above referenced project requires that:

- 1) You be supplied with the proper respirator and be trained in its use;
- 2) You be trained in safe work practices and in the use of equipment found on the job; and
- 3) You receive a medical examination. These things have been done at no cost to you.

RESPIRATORY PROTECTION: You must have been trained in the proper use of respirators and informed of the type of respirator to be used on the above referenced project. You must be given access to a copy of the written respiratory protection program issued by your employer. You must be equipped, at no cost, with the respirator to be used on the above project.

TRAINING COURSE: You must have been trained in the dangers inherent in handling asbestos and breathing asbestos dust, and in proper work procedures, and in personal and area protective measures. The topics covered in the course must have included the following:

- Physical characteristics of asbestos
- Health hazards associated with asbestos
- Respiratory protection
- Use of protective equipment
- Pressure Differential Systems
- Work practices including hands-on or on-the job training
- Personal Decontamination procedures
- Air monitoring, personal and area

MEDICAL EXAMINATION: You must have had a medical examination within the past 12 months at no cost to you. This examination must have included: health history and pulmonary function tests, and may have included an evaluation of a chest X-ray.

By signing this document, you are acknowledging only that the Owner of the building you are about to work in has advised you of your rights to training and protection relative to your employer, the Contractor.

Signature _____ Soc. Sec. No. _____

Printed Name _____

CERTIFICATION OF FINAL VISUAL INSPECTION for ASBESTOS ABATEMENT PROJECTS

BUILDING: _____

WORK AREA: _____

CONTRACTOR'S REPRESENTATIVE CERTIFICATION

In accordance with the project specifications, the Contractor's Representative hereby certifies that they have visually inspected the entire asbestos work area including all applicable surfaces (pipes, ledges, walls, ceilings, floors, decon unit, poly, etc.) and have found no visible dust, debris, or residue.

NAME: _____ DATE: _____

SIGNATURE: _____

COMPANY: _____

Ohio EPA

Recommended Asbestos Medical Examination Determination

Information to the Examining Physician: Please complete this form in order to assist the employer to comply with the Chapter 3710 of the Ohio Revised Code. This chapter requires that licensed asbestos hazard abatement contractors possess a worker protection program consistent with the requirements of the United States Occupational Safety and Health Administration Asbestos Construction Standard 29 CFR 1926.1101.

Name of Individual Examined: _____

Employer: _____

Home Address of Individual: _____

Date of Examination: _____

Based upon the results of my examination of the above named individual, I hereby declare that he or she (check and complete as necessary);

	Is physically able to perform work as required by OSHA 29 CFR 1926.1101 and wear a negative pressure respirator.

	Is physically able to perform work as required by OSHA 29 CFR 1926.1101 and wear a negative pressure respirator under the following limitations: _____
	Is not physically able to perform work as required by OSHA 29 CFR 1926.1101 and wear a negative pressure respirator.

Name of Medical Facility: _____

Address of Medical Facility: _____

Telephone Number of Medical Facility: _____

Printed Name of Examining Physician: _____

Signature of Examining Physician: _____

◆ END OF SECTION ◆

HANDLING & DISPOSAL OF FLUORESCENT TUBES AND BATTERIES

1. PART 1 GENERAL

1.1 REFERENCES

- A. The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.
- B. U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)
 - 40 CFR 1910.1000 Air Contaminants
 - 40 CFR 260 Hazardous Waste Management System: General
 - 40 CFR 261 Identification and Listing of Hazardous Waste
 - FR 262 Standards Applicable to Generators of Hazardous Waste
 - 40 CFR 263 Standards Applicable to Transporters of Hazardous Waste
 - 40 CFR 264 Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 40 CFR 265 Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
 - 40 CFR 268 Land Disposal Restrictions
 - 40 CFR 270 EPA Administered Permit Programs: The Hazardous Waste Permit Program
 - 40 CFR 273 Standards For Universal Waste Management
 - 40 CFR 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions
 - 49 CFR 178 Specifications for Packaging

1.2 DEFINITIONS

- A. Universal Waste
 - 1) Universal Waste means any of the following hazardous wastes that are managed under the universal waste requirements 40 CFR 273:
 - a) Batteries as described in Sec. 273.2 of this chapter;
 - b) Lamps as described in Sec. 273.5 of this chapter.

1.3 QUALITY ASSURANCE

- A. Regulatory Requirements

- 1) Perform work in accordance with 40 CFR 761 and perform mercury-containing lamps storage and transport in accordance with 40 CFR 261, 40 CFR 264, 40 CFR 265, and 40 CFR 273.

B. Training

- 1) Certified industrial hygienist (CIH) shall instruct and certify the training of all persons involved in the removal of batteries and mercury-containing lamps. The instruction shall include: The dangers of mercury exposure, decontamination, safe work practices, and applicable OSHA and EPA regulations. The CIH shall review and approve the Battery and Mercury-Containing Lamp Removal Work Plans.

C. Regulation Documents

- 1) Maintain at all times one copy each at the office and one copy each in view at the job site of 29 CFR 1910.1000, 40 CFR 260, 40 CFR 261, 40 CFR 262, 40 CFR 263, 40 CFR 265, 40 CFR 268, 40 CFR 270, and 40 CFR 273, and of the Contractor removal work plan and disposal plan for PCB and for associated mercury-containing lamps.

1.4 SUBMITTALS

- A. Certificates
- B. Training Certification
- C. Removal Work Plan
- D. Disposal Plan
- E. Closeout Submittals
- F. Certificate of Disposal and/or recycling. Submit to the Government before application for payment within 30 days of the date that the disposal of the batteries and mercury-containing lamp waste identified on the manifest was completed.

1.5 ENVIRONMENTAL REQUIREMENTS

- A. Use special clothing:
 - 1) Disposable gloves (polyethylene)
 - 2) Eye protection
 - 3) PPE as required

1.6 SCHEDULING

- A. Notify the Contracting Officer 20 days prior to the start of removal work.

1.7 QUALITY ASSURANCE

A. Work Plan

- 1) Submit a job-specific plan within 20 calendar days after award of contract of the work procedures to be used in the removal, packaging, and storage of batteries and mercury-containing lamps. Include in the plan: Requirements for Personal Protective Equipment (PPE), spill cleanup procedures and equipment, eating, smoking and restroom procedures. The plan shall be approved and signed by the Certified Industrial Hygienist. Obtain approval of the plan by the Contracting Officer prior to the start of removal work.

B. Disposal/Recycling Plan

- 1) Submit a battery and lamp Disposal or Recycling Plan with 45 calendar days after award of contract. The Plan shall comply with applicable requirements of federal, state, and local regulations and address:
 - a) Estimated quantities of wastes to be generated, disposed of, and/or recycled.
 - b) Names and qualifications of each Contractor that will be transporting, storing, treating, and disposing of the wastes. Include the facility location. Furnish two copies of EPA and state mercury-containing lamp waste permit applications and EPA identification numbers, as required.
 - c) Names and qualifications (experience and training) of personnel
 - d) who will be working on-site with wastes.
 - e) Spill prevention, containment, and cleanup contingency measures to be implemented.
 - f) Work plan and schedule for waste removal, containment, storage, transportation, disposal and or recycling. Wastes shall be cleaned up and containerize daily.

2. PART 2 PRODUCTS

- 2.1 Not used.

3. PART 3 EXECUTION

3.1 WORK PROCEDURE

- A. Furnish labor, materials, services, and equipment necessary for the removal of batteries and mercury-containing fluorescent lamps, in accordance with local, state, or federal regulations. Do not expose lamps or batteries to open flames or

other high temperature sources since toxic decomposition by-products may be produced. Do not break mercury containing fluorescent lamps or battery casings.

B. Work Operations

- 1) Ensure that work operations or processes involving Universal Waste materials are conducted in accordance with 40 CFR 761, 40 CFR 262 40 CFR 263, and the applicable requirements of this section, including but not limited to:
 - a) Obtaining suitable storage sites.
 - b) Notifying Contracting Officer prior to commencing the operation.
 - c) Reporting leaks and spills to the Contracting Officer.
 - d) Cleaning up spills.
 - e) Inspecting Universal Waste items and waste containers for leaks and forwarding copies of inspection reports to the Contracting Officer.
 - f) Maintaining inspection, inventory and spill records.

3.2 REMOVAL

A. Lighting Lamps

- 1) Remove lighting tubes/lamps from the lighting fixture and carefully place (unbroken) into appropriate containers (original transport boxes or equivalent). In the event of a lighting tube/lamp breaking, sweep and place waste in double plastic taped bags and dispose of as universal waste as specified herein.

B. Batteries

- 1) Remove batteries from the fixtures and carefully place into appropriate containers for transportation to an EPA licensed recycling facility.

3.3 STORAGE FOR DISPOSAL

A. Storage Containers for Batteries

- 1) Store batteries in containers approved by DOT in accordance with 40 CFR 761.

B. Storage Containers for lamps

- 1) Store mercury containing lamps in appropriate DOT containers. The boxes shall be stored and labeled for transport in accordance with 40 CFR 273.

C. Labeling of Waste Containers

- 1) Label with the following:
 - a) Date the item was placed in storage and the name of the cognizant activity/building.
 - b) Label mercury-containing lamp waste in accordance with 40 CFR 273. Affix labels to all lighting waste containers.

3.4 DISPOSAL

- A. Dispose of off Government property in accordance with EPA, DOT, and local regulations at a permitted site.
- B. Identification Number
 - 1) For mercury containing lamp removal, Federal regulations 40 CFR 273 require that large quantity handlers of Universal waste (LQHUW) must provide notification of universal waste management to the appropriate EPA Region (or state director in authorized states), obtain an EPA identification number, and retain for three years records of off-site shipments of universal waste. The contractor shall verify that the activity has a U.S. EPA generator identification number for use on the Universal Waste manifest. If not, the contractor shall advise the activity that it must file and obtain an I.D. number with EPA prior to commencement of removal work.

◆ END OF SECTION ◆

ACM, LEAD PAINT AND HAZMAT INSPECTION REPORT

**INSPECTION LOCATION:
GRAND LAKE ST. MARYS
ODNR PARK OFFICE AND CHECK OUT BLDG**



CLIENT:

**MICHAEL P. ROWE, AIA, NCARB, LEED AP
PARTNER / ARCHITECT
314 CONANT STREET, MAUMEE, OHIO 43537 USA |
BUEHRER GROUP ARCHITECTURE & ENGINEERING
314 CONANT STREET
MAUMEE, OH 43637
P 419.893.9021**

**INSPECTION DATE:
January 17, 2025**

**CONDUCTED BY:
CASTLE HILL ASSOCIATES, LLC
1197 FARNSWORTH RD. – SUITE E
WATERVILLE, OH 43566
WWW.CASTLEHILLASSOCIATES.COM
(567) 952-0212**



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INSPECTION SUMMARY

On 1-17-25, Samuel Ansara of Castle Hill Associates performed an ACM LBP and Hazmat inspection at the Grand Lake St. Mary's Park Office and Check Out Bldg located at the ODNR site at St. Mary's Ohio.

Asbestos:

The asbestos inspection was conducted for compliance with the current US EPA NESHAP and Ohio EPA regulations regarding the identification of suspect asbestos materials in buildings prior to renovation or demolition. All interior and exterior building materials were inspected and tested, excluding the roofing materials.

A total of 29 asbestos bulk samples were collected and analyzed as part of this project from both bldgs (19 from Park office and 10 from Check Out Bldg). All bulk sampling of suspected asbestos was based upon the appearance, texture, and location of the material. All bulk samples were analyzed utilizing current EPA methods for PLM (Polarized Light Microscopy) by Eurofins Laboratory in Naperville, IL. The laboratory is accredited by the NIST, NVLAP program (National Institute of Standards and Technology, National Voluntary Laboratory Accreditation Program) and is also an American Industrial Hygiene Association (AIHA) accredited laboratory.

The inspection was conducted and the report was prepared by Samuel Ansara who is licensed by the Ohio EPA as an Asbestos Hazard Evaluation Specialist. Mr. Ansara has been conducting asbestos surveys since 1988, and is licensed asbestos inspector in Ohio.

Lead Paint:

Castle Hill used an XRF lead paint sampling device to test the various interior and exterior surfaces of each bldg. The purpose of the lead paint screening survey was to identify all major building components coated with lead-based paint. Lead XRF testing was conducted using a Viken Detection Model Pb200i direct read XRF analyzer. All sampling was conducted in accordance with current regulatory and industry standards for lead-based paint XRF sampling. Painted surfaces are considered to be "lead-based" paint as defined by HUD and the US EPA if the paint contains lead in quantities greater than 1.0 mg/cm². Lead-containing paint (LCP) as defined by OSHA contains lead in quantities greater than 0.0 mg/cm².

A detailed list of XRF sample data from both the Park Office and Check Out bldg is attached to this report. Only one building component was found to contain lead in excess of 1.0 mg/cm² which was the Porch columns of the Check out bldg.

Castle Hill also collected bldg materials from each bldg to for Toxicity Characteristic Leaching Procedure Testing (TCLP). This test is used to determine if the combination of bldg materials may result in the leaching of hazardous waste into the environment in a landfill post demolition. This test helps ensure environmental safety when handling, transporting, or disposing of potentially hazardous materials. Typically, if minimal bldg materials are found by XRF to not be lead containing, its highly likely that there will be no lead leachate. Samples

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for TCLP were collected from each building. According to the TCLP (Toxicity Characteristic Leaching Procedure), a waste is considered hazardous if its leachable lead concentration is equal to or greater than 5.0 milligrams per liter (mg/L), meaning that a lead level of 5 ppm or higher in the leachate would classify the waste as hazardous.

The survey for Universal Waste materials was performed to identify any materials which would need to be handled or disposed of for compliance with EPA regulations for Universal Wastes prior to demolition or renovation of the facility. Universal waste is required to be removed from a facility prior to demolition and they must be handled, transported, and disposed of in an approved facility. Other hazardous materials, chemical, petroleum products, and sub-surface contamination are not considered Universal wastes and were not included in the scope of this survey.

INSPECTION FINDINGS
ACM

As a result of the bulk sampling and lab analyses, the following asbestos containing materials were identified:

Park Office Building: No Asbestos Detected

Check Out Building:

ASBESTOS MATERIAL	LOCATIONS	QUANTITY
Brown Floor tile	Throughout interior of Check out bldg	1000 SF
Window Glazing	Check out window of bldg	10 SF

INSPECTION FINDINGS
LEAD and TCLP

Park Office Bldg

XRF Inspection: No building components found to be lead containing
TCLP Test: Building component TCLP Test found to be non-hazardous

Check Out Bldg

XRF Inspection: Porch columns found to be greater than 1 ppm
TCLP Test: Building component TCLP Test found to be non-hazardous

INSPECTION FINDINGS
HAZARDOUS MATERIALS

Park Office Bldg

The following hazmats should be containerized and removed prior to bldg demolition

- 22 fluorescent light tubes and associated light fixtures
- Small cache of office cleaning supplies
- 1 thermostat

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- 1 fire extinguisher
- 1 large HVAC unit (back of bldg outside)
- Computer and electronic devices
- One drinking fountain

Check Out Bldg

The following hazmats should be containerized and removed prior to bldg demolition

- 6 fluorescent light tubes and associated light fixtures
- Small cache of office cleaning supplies
- 1 thermostat
- 1 fire extinguisher
- 1 soda pop fridge
- 1 ice cream cooler

CONCLUSIONS/RECOMMENDATIONS

The asbestos containing materials identified in the building must be removed and disposed of by a State of Ohio licensed asbestos abatement contractor prior to disturbance at renovation or demolition. In addition, all abatement and demolition projects must first submit a 10-day notification to the Ohio EPA. If the building is not demolished, the materials can be managed in-place in accordance with OSHA regulations until removal is required at demolition.

ASBESTOS REMOVAL/DISPOSAL COST ESTIMATES

ABATEMENT ITEM	ABATEMENT COST ESTIMATE
Asbestos removal prior to renovation or demolition	
Check Out Bldg Floor Tile and Window Glazing	\$10,000

Removal cost notes:

- Cost estimates are provided for budget consideration only and they are the estimated costs for contracted services based upon the average project costs in the area.

Should any ACM or other suspect material be identified during the planning or demolition process that was previously unknown, work should cease until a certified inspection team can visit the site and assess and/or sample the material in question. Materials can often be inaccessible during the inspection process hidden behind inaccessible walls or floors or above ceilings.

Thank you for the opportunity to support the Buehrer Group and the Ohio Department of Natural Resources with this important project.

Best Regards,

Inspector:



Samuel D. Ansara
Asbestos Hazard Evaluation Specialist
Ohio EPA License ES31689
Expires 11/21/25



Brett Brumbaugh, REPA, CESCO
Asbestos Hazard Evaluation Specialist
Ohio EPA License ES3488
Expires 3/28/25

ASBESTOS INSPECTION SAMPLING PROTOCOL & GLOSSARY

SAMPLING PROTOCOL

The bulk samples were collected in accordance with AHERA regulations (Title II of the "Federal Toxic Substances Control Act" found in 40 CFR Part 763.86) from locations that were selected to be representative of the building materials. Sampling was accomplished using the simplified sampling scheme referenced in the AHERA regulations and found in the "Pink Book". Locations of individual samples are referenced on this report.

The samples were either collected with a coring tool designed for asbestos sampling or placed into a plastic bag for laboratory analysis. The samples were analyzed via polarized light microscopy with dispersion staining, using the "Interim method for the Determination of Asbestos in Bulk Insulation Samples" found in Appendix A to Subpart F in 40 CFR Part 763.

The regulations require specific numbers of samples be obtained per homogeneous area. For example, when sampling for joint compound or asbestos in hard plaster (sprayed-on or troweled-on surfacing materials) samples are to be taken based on the following increments: 0 to 1000 square feet of material, 3 samples are necessary. From 1001 to 5000 square feet, 5 samples are necessary, over 5000 square feet 7 samples are required. If during analysis any samples are found to contain asbestos, the entire homogeneous area is delineated as asbestos containing material. In the case of pipe insulation or other types of manufactured materials, the regulations require only enough samples to ascertain whether asbestos is present. In this case, the minimum number of samples to collect and analyze is usually three. The sampling performed in this inspection followed these sampling guidelines.

ASBESTOS GLOSSARY OF TERMS

Friable asbestos material: means any material containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763 section 1, Polarized Light Microscopy, that, when dry, can be crumbled, pulverized, or reduced to powder by hand pressure.

Category I Non-Friable Asbestos Containing Material (ACM) means asbestos containing packings, gaskets, resilient floor coverings, and asphalt roofing products containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, Section 1, Polarized Light Microscopy.

Category II Non-friable ACM means any material, excluding Category I non-friable ACM, containing more than 1 percent asbestos as determined using the method specified in appendix E, subpart E, 40 CFR part 763, section 1, Polarized Light Microscopy that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

Regulated Asbestos Containing Material (RACM): means (a) Friable asbestos material, (b) Category I non-friable ACM that has become friable, (c) category I non-friable ACM that will be or has been subjected to sanding, grinding, cutting, or abrading, or (d) Category II non-friable ACM that has a high probability of becoming or has become crumbled, pulverized, or reduced to powder by the forces expected to act on the material expected in the course of demolition or renovation operations regulated by this subpart.

ASBESTOS BULK SAMPLE DESCRIPTIONS & RESULTS

Asbestos PLM Bulk Sampling Data

Client Name: **Buehrer Group**
 Site: **ODNR St Marys Park Office BLDG**
 Address: **834 Edgewater Dr, St Marys, OH 45885**
 Sampling Date: **1-17-25**
 Inspector: **Sam Ansara**
 Certification: **Ohio Asbestos Hazard Eval. Specialist #31689**
 Analysis Dates: **1-22-25**
 Laboratory: **EuroFins Naperville, IL**

SAMPLE #	SPACE	TENANT	MATERIAL	SAMPLING LOCATION	LABORATORY RESULT
1	exterior	ODNR	roofing	at front porch	No Asbestos Detected
2	exterior	ODNR	roofing	at front porch	No Asbestos Detected
3	exterior	ODNR	foundation tar paper	under siding	No Asbestos Detected
4	exterior	ODNR	foundation tar paper	under siding	No Asbestos Detected
5	exterior	ODNR	siding wrap	under siding	No Asbestos Detected
6	exterior	ODNR	siding wrap	under siding	No Asbestos Detected
7	exterior	ODNR	HVAC caulk on AC unit	on AC unit back of bldg	No Asbestos Detected
8	exterior	ODNR	HVAC caulk on AC unit	on AC unit back of bldg	No Asbestos Detected
9	interior	ODNR	12" white floor tile	lobby entrance	No Asbestos Detected
10	interior	ODNR	12" white floor tile	lobby entrance	No Asbestos Detected
11	interior	ODNR	12" wood type floor tile	ladies rr	No Asbestos Detected
12	interior	ODNR	12" wood type floor tile	mens rr	No Asbestos Detected
13	interior	ODNR	1' white ceiling tile	ladies rr	No Asbestos Detected
14	interior	ODNR	1' white ceiling tile	ladies rr	No Asbestos Detected
15	interior	ODNR	drywall w mud	safe room	No Asbestos Detected
16	interior	ODNR	drywall w mud	safe room	No Asbestos Detected
17	interior	ODNR	drywall w mud	safe room	No Asbestos Detected
18	interior	ODNR	12" beige floor tile	safe room	No Asbestos Detected
19	interior	ODNR	12" beige floor tile	safe room	No Asbestos Detected

Asbestos PLM Bulk Sampling Data

Client Name: **Buehrer Group**
Site: **ODNR St Marys Check Out BLDG**
Address: **834 Edgewater Dr, St Marys, OH 45885**
Sampling Date: **1-17-25**
Inspector: **Sam Ansara**
Certification: **Ohio Asbestos Hazard Eval. Specialist #31689**
Analysis Dates: **1-22-25**
Laboratory: **EuroFins Naperville, IL**

SAMPLE #	SPACE	TENANT	MATERIAL	SAMPLING LOCATION	LABORATORY RESULT
1	lobby	ODNR	brown spotted floor tile	by entrance to office	8% Chrysotile
2	lobby	ODNR	brown spotted floor tile	by entrance to office	8% Chrysotile
3	exterior	ODNR	grey window glazing	at check out window	6% Chrysotile
4	exterior	ODNR	grey window glazing	at check out window	4% Chrysotile
5	office	ODNR	brown cove base	at entrance to office	No Asbestos Detected
6	office	ODNR	brown cove base	at entrance to office	No Asbestos Detected
7	exterior	ODNR	window caulk exterior newer window	w exterior wall	No Asbestos Detected
8	exterior	ODNR	window caulk exterior newer window	w exterior wall	No Asbestos Detected
9	exterior	ODNR	roofing	entrance porch area	No Asbestos Detected
10	exterior	ODNR	roofing	entrance porch area	No Asbestos Detected

PHOTOGRAPHS OF ASBESTOS MATERIALS

Photo A1 Check out bldg Floor tile	
Photo A2 Window Glazing	

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LEAD PAINT SAMPLING DATA XRF

Site: St Marys ODNR
 Location: 834 Edgewater Drive St Marys Ohio 45885
 Building: Park Office
 Inspector: Sam Ansara Brett Brumbaugh
 Date: 1/17/2025
 XRF Mfg.: Viken Detection
 Model: Pb200i
 Type: XRF Lead Paint Analyzer
 Serial #: 2757

Reading #	Room/Area	Component	Substrate	Paint Color	Pb Conc. mg/cm ²	Result
1	outdoors	porch rail	Metal	black	0.1	Negative
2	outdoors	door casing	Metal	green	0.2	Negative
3	outdoors	door	Metal	brown	0.0	Negative
4	outdoors	siding	plastic	beige	0.2	Negative
5	outdoors	porch roof	metal	beige	0.2	Negative
6	outdoors	siding	Metal	beige	0.2	Negative
7	outdoors	downspout	Metal	green	0.2	Positive
8	outdoors	door trim	wood	green	0.0	Negative
9	outdoors	door (side door)	Metal	beige	0.0	Negative
10	outdoors	porch column	wood	green	0.8	Negative
11	outdoors	corner trim	Metal	green	0.1	Negative
12	lobby	door trim	wood	beige	0.1	Negative
13	lobby	wall	wood	beige	0.1	Negative
14	lobby	door	wood	beige	0.1	Negative
15	front right office	wall	wood	brown	0.0	Negative
16	back right office	door trim	wood	black	0.1	Negative
17	in safe room	door trim	wood	white	0.0	Negative
18	in safe room	electric panel	metal	beige	0.0	Negative
19	lobby	ceiling	drywall	white	0.1	Negative

NOTE: Any XRF reading equal to or greater than 1.0 mg/cm² is considered to be lead-based paint.

Site: St Marys ODNR
 Location: 834 Edgewater Drive St Marys Ohio 45885
 Building: Check Out Bldg
 Inspector: Sam Ansara Brett Brumbaugh
 Date: 1/17/2025
 XRF Mfg.: Viken Detection
 Model: Pb200i
 Type: XRF Lead Paint Analyzer
 Serial #: 2757

Reading #	Room/Area	Component	Substrate	Paint Color	Pb Conc. mg/cm ²	Result
1	outdoors	wall	wood	beige	0.0	Negative
2	outdoors	trim	wood	green	0.1	Negative
3	outdoors	door	Metal	beige	0.0	Negative
4	outdoors	wall	cmu	beige	0.2	Negative
5	outdoors	window	wood	green	0.0	Negative
6	outdoors	window trim	wood	green	0.0	Negative
7	outdoors	porch column	wood	green	1.3	Positive
8	outdoors	fascia	wood	green	0.0	Negative
9	outdoors	door	Metal	white	0.1	Negative
10	outdoors	porch column	wood	green	1.3	Positive
11	outdoors	hand rail	Metal	black	0.1	Negative
12	storage room	wall	wood	white	0.0	Negative
13	storage room	wall	wood	black	0.1	Negative
14	office	door trim	wood	beige	0.0	Negative
15	lobby	wall	cmu	white	0.1	Negative
16	lobby	entrance door	metal	white	0.0	Negative
17	lobby	wall slats	wood	white	0.0	Negative

NOTE: Any XRF reading equal to or greater than 1.0 mg/cm2 is considered to be lead-based paint.

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LABORATORY ANALYTICAL REPORTS

ASBESTOS AND TCLP

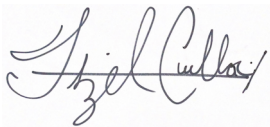
Report for:

Mr. Brett Brumbaugh, REPA
Castle Hill Associates
PO Box 283
Waterville, OH 43566

Regarding: Eurofins Built Environment Testing Central, LLC
Project: ODNR Park Office; ACM Survey
EML ID: 3919575

Approved by:

Dates of Analysis:
Asbestos PLM: 01-22-2025



Laboratory Manager
Itzel Cuellar

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)
NVLAP Lab Code 600194-0

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received and tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

Eurofins Built Environment Testing Central, LLC ("the Company"), a member of the Eurofins Built Environment Testing group of companies, shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Total Samples Submitted: 19

Total Samples Analyzed: 19

Total Samples with Layer Asbestos Content > 1%: 0

Location: PO-1

Lab ID-Version‡: 19441126-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Black Pebbles	ND
Composite Non-Asbestos Content:	15% Glass Fibers
Sample Composite Homogeneity:	Good

Location: PO-2

Lab ID-Version‡: 19441127-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Black Pebbles	ND
Composite Non-Asbestos Content:	15% Glass Fibers
Sample Composite Homogeneity:	Good

Location: PO-3

Lab ID-Version‡: 19441128-1

Sample Layers	Asbestos Content
Black Tar Paper	ND
Composite Non-Asbestos Content:	55% Cellulose
Sample Composite Homogeneity:	Good

Location: PO-4

Lab ID-Version‡: 19441129-1

Sample Layers	Asbestos Content
Black Tar Paper	ND
Composite Non-Asbestos Content:	55% Cellulose
Sample Composite Homogeneity:	Good

The test report shall not be reproduced except in full, without written approval of the laboratory. The report must not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the federal government. The Company reserves the right to dispose of all samples after a period of thirty (30) days, according to all state and federal guidelines, unless otherwise specified.

All components not quantified as asbestos content and non-asbestos content are considered to be non-fibrous matrix components. Matrix components may include, but are not limited to, gypsum, paint, silicate minerals, vinyl, binder, calcium carbonate, tar, and foam.

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: PO-5

Lab ID-Version‡: 19441130-1

Sample Layers	Asbestos Content
Black Fibrous Material	ND
Composite Non-Asbestos Content:	55% Cellulose
Sample Composite Homogeneity:	Good

Location: PO-6

Lab ID-Version‡: 19441131-1

Sample Layers	Asbestos Content
Black Fibrous Material	ND
Composite Non-Asbestos Content:	55% Cellulose
Sample Composite Homogeneity:	Good

Location: PO-7

Lab ID-Version‡: 19441132-1

Sample Layers	Asbestos Content
Gray Caulk	ND
Sample Composite Homogeneity:	Good

Location: PO-8

Lab ID-Version‡: 19441133-1

Sample Layers	Asbestos Content
Gray Caulk	ND
Sample Composite Homogeneity:	Good

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: PO-9

Lab ID-Version‡: 19441134-1

Sample Layers	Asbestos Content
White Floor Tile	ND
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: PO-10

Lab ID-Version‡: 19441135-1

Sample Layers	Asbestos Content
White Floor Tile	ND
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: PO-11

Lab ID-Version‡: 19441136-1

Sample Layers	Asbestos Content
Brown Sheet Flooring	ND
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: PO-12

Lab ID-Version‡: 19441137-1

Sample Layers	Asbestos Content
Brown Sheet Flooring	ND
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: PO-13

Lab ID-Version‡: 19441138-1

Sample Layers	Asbestos Content
Beige Ceiling Tile with White Surface	ND
Composite Non-Asbestos Content:	40% Cellulose 20% Glass Fibers
Sample Composite Homogeneity:	Good

Location: PO-14

Lab ID-Version‡: 19441139-1

Sample Layers	Asbestos Content
Beige Ceiling Tile with White Surface	ND
Composite Non-Asbestos Content:	40% Cellulose 20% Glass Fibers
Sample Composite Homogeneity:	Good

Location: PO-15

Lab ID-Version‡: 19441140-1

Sample Layers	Asbestos Content
White Drywall with Brown Paper and Paint	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Good

Location: PO-16

Lab ID-Version‡: 19441141-1

Sample Layers	Asbestos Content
White Drywall with Brown Paper and Paint	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Good

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: PO-17

Lab ID-Version‡: 19441142-1

Sample Layers	Asbestos Content
White Drywall with Brown Paper and Paint	ND
Composite Non-Asbestos Content:	10% Cellulose
Sample Composite Homogeneity:	Good

Location: PO-18

Lab ID-Version‡: 19441143-1

Sample Layers	Asbestos Content
Beige Floor Tile	ND
Yellow Mastic	ND
Sample Composite Homogeneity:	Moderate

Location: PO-19

Lab ID-Version‡: 19441144-1

Sample Layers	Asbestos Content
Beige Floor Tile	ND
Yellow Mastic	ND
Sample Composite Homogeneity:	Moderate

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Park Office; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

PROJECT ANALYST AND SIGNATORY REPORT

Project Analyst



Analyst: Amber Rutter

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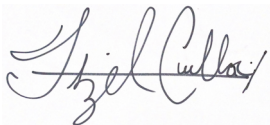
Report for:

Mr. Brett Brumbaugh, REPA
Castle Hill Associates
PO Box 283
Waterville, OH 43566

Regarding: Eurofins Built Environment Testing Central, LLC
Project: ODNR Check Our Building; ACM Survey
EML ID: 3919572

Approved by:

Dates of Analysis:
Asbestos PLM: 01-22-2025



Laboratory Manager
Itzel Cuellar

Service SOPs: Asbestos PLM (EPA 40CFR App E to Sub E of Part 763 & EPA METHOD 600/R-93-116, SOP EM-AS-S-1267)
NVLAP Lab Code 600194-0

All samples were received in acceptable condition unless noted in the Report Comments portion in the body of the report. The results relate only to the samples as received and tested. The results include an inherent uncertainty of measurement associated with estimating percentages by polarized light microscopy. Measurement uncertainty data for sample results with >1% asbestos concentration can be provided when requested.

Eurofins Built Environment Testing Central, LLC ("the Company"), a member of the Eurofins Built Environment Testing group of companies, shall have no liability to the client or the client's customer with respect to decisions or recommendations made, actions taken or courses of conduct implemented by either the client or the client's customer as a result of or based upon the Test Results. In no event shall the Company be liable to the client with respect to the Test Results except for the Company's own willful misconduct or gross negligence nor shall the Company be liable for incidental or consequential damages or lost profits or revenues to the fullest extent such liability may be disclaimed by law, even if the Company has been advised of the possibility of such damages, lost profits or lost revenues. In no event shall the Company's liability with respect to the Test Results exceed the amount paid to the Company by the client therefor.

Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Check Our Building; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Total Samples Submitted:	10
Total Samples Analyzed:	10
Total Samples with Layer Asbestos Content > 1%:	4

Location: CO-1

Lab ID-Version‡: 19441157-1

Sample Layers	Asbestos Content
Brown Floor Tile	8% Chrysotile
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: CO-2

Lab ID-Version‡: 19441158-1

Sample Layers	Asbestos Content
Brown Floor Tile	8% Chrysotile
Yellow Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: CO-3

Lab ID-Version‡: 19441159-1

Sample Layers	Asbestos Content
Gray Window Glazing	6% Chrysotile
Sample Composite Homogeneity: Good	

Location: CO-4

Lab ID-Version‡: 19441160-1

Sample Layers	Asbestos Content
Gray Window Glazing	4% Chrysotile
Sample Composite Homogeneity: Good	

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Check Our Building; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: CO-5

Lab ID-Version‡: 19441161-1

Sample Layers	Asbestos Content
Brown Baseboard	ND
Brown Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: CO-6

Lab ID-Version‡: 19441162-1

Sample Layers	Asbestos Content
Brown Baseboard	ND
Brown Mastic	ND
Sample Composite Homogeneity: Moderate	

Location: CO-7

Lab ID-Version‡: 19441163-1

Sample Layers	Asbestos Content
White Caulk with Paint	ND
Sample Composite Homogeneity: Good	

Location: CO-8

Lab ID-Version‡: 19441164-1

Sample Layers	Asbestos Content
White Caulk with Paint	ND
Sample Composite Homogeneity: Good	

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Check Our Building; ACM Survey

Date of Receipt: 01-21-2025
Date of Report: 01-24-2025

ASBESTOS PLM REPORT

Location: CO-9

Lab ID-Version‡: 19441165-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Black Pebbles	ND
Black Roofing Tar	ND
Black Roofing Felt	ND
Transparent Non-Fibrous Material	ND
Composite Non-Asbestos Content:	15% Glass Fibers 10% Cellulose
Sample Composite Homogeneity:	Poor

Location: CO-10

Lab ID-Version‡: 19441166-1

Sample Layers	Asbestos Content
Black Roofing Shingle with Black Pebbles	ND
Black Roofing Felt	ND
Composite Non-Asbestos Content:	15% Glass Fibers 10% Cellulose
Sample Composite Homogeneity:	Moderate

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Client: Castle Hill Associates
C/O: Mr. Brett Brumbaugh, REPA
Re: ODNR Check Our Building; ACM Survey

Date of Receipt: 01-21-2025
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ASBESTOS PLM REPORT

PROJECT ANALYST AND SIGNATORY REPORT

Project Analyst



Analyst: Amber Rutter

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**EMSL Analytical, Inc.**

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax: 317.803.3047
IndianapolisLab@emsl.com / www.Emsl.com

EMSL Order ID: 162550939
LIMS Reference ID: CD50939
EMSL Customer ID: CHAS42

Attention: Brett Brumbaugh
Castle Hill Associates, LLC [CHAS42]
1197 Farnsworth Rd, Suite E
Waterville, OH 43566
(567) 952-0212
bbrumbaugh@castlehillassociates.com

Project Name: ODNR Grand Lake

Customer PO: ODNR
EMSL Sales Rep: Anthony DeRosa
Received: 01/22/2025 11:36
Reported: 01/29/2025 09:11

Analytical Results

Analyte	Results	RL	Prep Date & Tech	Prep Method	Analysis Date & Analyst	Analytical Method	Q	DF
Client Sample ID: COB-01/CHECK OUT BLDG						Date Sampled: 01/17/25		
Matrix: Solid						LIMS Reference ID: CD50939-01		
Lead	1.1 mg/L	0.40 mg/L	01/28/25 CG	TCLP Extraction	01/28/25 CG	SW 846-7000B		1
Sample Comments:								
Client Sample ID: COB-02/PARK OFFICE BLDG						Date Sampled: 01/17/25		
Matrix: Solid						LIMS Reference ID: CD50939-02		
Lead	0.67 mg/L	0.40 mg/L	01/28/25 CG	TCLP Extraction	01/28/25 CG	SW 846-7000B		1
Sample Comments:								

**EMSL Analytical, Inc.**

6340 Castleplace Drive, Indianapolis, IN, 46250
Telephone: 317.803.2997 Fax: 317.803.3047
IndianapolisLab@emsl.com / www.Emsl.com

EMSL Order ID: 162550939**LIMS Reference ID:** CD50939**EMSL Customer ID:** CHAS42

Attention: Brett Brumbaugh
Castle Hill Associates, LLC [CHAS42]
1197 Farnsworth Rd, Suite E
Waterville, OH 43566
(567) 952-0212
bbrumbaugh@castlehillassociates.com

Project Name: ODNR Grand Lake

Customer PO: ODNR
EMSL Sales Rep: Anthony DeRosa

Received: 01/22/2025 11:36
Reported: 01/29/2025 09:11

Notes and Definitions

Item	Definition
(Dig)	For metals analysis, sample was digested.
[2C]	Reported from the second channel in dual column analysis.
DF	Dilution Factor
MDL	Method Detection Limit.
ND	Analyte was NOT DETECTED at or above the detection limit.
NR	Spike/Surrogate showed no recovery.
Q	Qualifier
RL	Reporting Limit
Wet	Sample is not dry weight corrected.

Measurement of uncertainty and any applicable definitions of method modifications are available upon request. Per EPA NLLAP policy, sample results are not blank corrected.

Aleks Kuchenbrod Laboratory Manager or other approved signatory

EMSL maintains liability limited to cost of analysis. Interpretation and use of test results are the responsibility of the client. This report relates only to the samples reported above and may not be reproduced, except in full, without written approval by EMSL. EMSL bears no responsibility for sample collection activities or analytical method limitations. The report reflects the samples as received. Results are generated from the field sampling data (sampling volumes and areas, locations, etc.) provided by the client on the Chain of Custody. QC sample results are within quality control criteria and met method specifications unless otherwise noted. All results for soil samples are reported on a dry weight basis, unless otherwise noted.

INSPECTOR CERTIFICATIONS



Mike DeWine, Governor
Jon Husted, Lt. Governor
Anne M. Vogel, Director

10/24/2024

Samuel Ansara
1248 Applegate
Waterville, OH 43566

RE: Evaluation Specialist
Certification Number: ES31689
Expiration Date: 11/21/2025

Dear Samuel Ansara:

This letter and enclosed certification card approves your request to be certified as an asbestos Evaluation Specialist. You must present your card upon request at any project site while performing duties. Copies of cards are not acceptable as proof of certification.

This certification may be revoked by the Director of the Ohio Environmental Protection Agency (EPA) for violation of any of the requirements of 3745-22 or 3745-20 of the Ohio Administrative Code.

If you have any questions, please contact the Asbestos Program at 614-644-0226 or by email at asbestoslicensing@epa.ohio.gov.

Sincerely,

Brandon M. Schwendeman

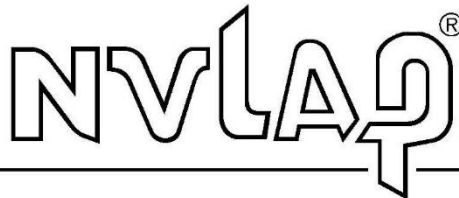
Brandon Schwendeman
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control



P.O. Box 1049 • Columbus, OH 43216-1049
44-3020 • (614) 644-3184 (fax)

LABORATORY CERTIFICATION

United States Department of Commerce
National Institute of Standards and Technology



Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 600194-0

Eurofins EMLab P&K
Naperville, IL

*is accredited by the National Voluntary Laboratory Accreditation Program for specific services,
listed on the Scope of Accreditation, for:*

Asbestos Fiber Analysis

*This laboratory is accredited in accordance with the recognized International Standard ISO/IEC 17025:2017.
This accreditation demonstrates technical competence for a defined scope and the operation of a laboratory quality
management system (refer to joint ISO-ILAC-IAF Communiqué dated January 2009).*

2023-07-01 through 2024-06-30
Effective Dates




For the National Voluntary Laboratory Accreditation Program

ACM LBP HAZMAT INSPECTION REPORT
ODNR ST. MARYS OHIO
JANUARY 30, 2025

National Voluntary
Laboratory Accreditation Program



SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Eurofins EMLab P&K
1815 W. Diehl Rd.
Suite 800
Naperville, IL 60563
Claudia Palermo
Phone: 856-334-1001
Email: claudia.palermo@et.eurofinsus.com
<https://www.eurofinsus.com/Built>

ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 600194-0

Bulk Asbestos Analysis

Code

Description

18/A01

EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples

18/A03

EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

A handwritten signature in blue ink, appearing to read 'Claudia Palermo', is written over a horizontal line.

For the National Voluntary Laboratory Accreditation Program

Effective 2023-07-01 through 2024-06-30

Page 1 of 1

Document 00 41 13 - Bid Form (General Contract / Electronic Bid)

State of Ohio Standard Requirements for Public Facility Construction

THIS SAMPLE BID FORM IS PROVIDED WITH THE PROJECT MANUAL AS A PLACEHOLDER ONLY – SUBMIT YOUR BID USING THE ELECTRONIC BID FORM ON [HTTPS://BIDEXPRESS.COM](https://bidexpress.com)

General Info

Number

DNR-250013

Description

The work consists of the necessary labor, equipment, tools and materials for a new park office for Grand Lake St Marys State Park.

Deadline

11/6/25 2:00 P.M.

Advertised

10/9/25, 10/16/25, 10/23/25

Business Name

Ohio Department of Natural Resources

Project Documents

→ Public Bid Advertisement

→ Notice to Bidders

→ Procurement & Contracting Requirements and Specifications

→ Plans, elevations, sections, details, and schedules

4 Attachments

Contract Times and Addenda

Contract Times

The time for Substantial Completion of all Work is 501 calendar days

Acknowledgement of receipt of Addenda

Date Addendum
#1 Received

Date Addendum
#2 Received

Date Addendum
#3 Received

Date Addendum
#4 Received

Instructions for Entering Bid Amounts

Allowances

Allowance amounts are fixed and no entry of data is required by the Bidder. The Bidder's Fee (overhead and profit) and costs for unloading and handling on the Site, labor, installation costs, and other expenses contemplated for the Allowance must be included in the Lump Sum below. Allowances will automatically be reflected in the Bid Total.

Unit Prices

Include the Unit Price, broken out by Labor and Material, for each and every Line Item in the schedule below. Unit Prices will automatically be reflected in the Bid Total.

Lump Sum

Enter the amount for each Lump Sum item in the Bid Schedule below. Lump Sum prices will automatically be reflected in the Bid Total. Allowances and Unit Prices should not be included in the Lump Sum items as Bid Express will automatically include Allowance and Unit Prices in the Bid Total.

Alternates

Enter the amount of each and every Alternate to ADD TO or DEDUCT FROM the Bid Total for the associated Bid Package. Indicate amounts to DEDUCT FROM the Bid Total by entering a minus sign (-) before the amount entered. Alternates are not reflected in the Bid Total.

Note: ODNR may reject any or all bids as best serves its interests.

Allowances

Order	Item No.	Description	Quantity	Alternate	Optional	Fixed (Unit Price)	Unit Price
1	Allowance 1	Utility Fees	1			30,000.00	
2	Allowance 2	FFE	1			60,000.00	

Lump Sum

Order	Item No.	Description	Item Type	Quantity	Unit	Alternate	Optional	Fixed (Unit Price)	Unit Price
1	1	Base Bid	Labor & Material	1	LS				
TOTAL									

Alternates

Order	Item No.	Description	Item Type	Quantity	Unit	Alternate	Optional	Fixed (Unit Price)	Unit Price
1	1	Ceramic Tile	Labor & Material	1	LS				
2	2	Standing Seam Metal Roof Instead of Shingle Roof	Labor & Material	1	LS				
3	3	Additional Casework and Casework Upgrades	Labor & Material	1	LS				

4	4	Pedestrian Lighting and Additional Lighting	Labor & Material	1	LS
TOTAL					

■ Bidder Affirmation and Disclosure

The Bidder acknowledges that by submitting its Bid, the Bidder has read and understands the applicable Executive Orders regarding the prohibitions of performance of offshore services, locating State data offshore in any way, or purchasing from Russian institutions or companies. If awarded a Contract, the Bidder will become the Contractor and affirms that both the Contractor and its Subcontractors shall perform no services requested under this Contract outside of the United States.

The Bidder shall provide the locations where services under this Contract will be performed in the spaces provided below or by attachment. Failure to provide this information as part of its Bid may cause the Bidder to be deemed non-responsive and no further consideration will be given to its Bid. If the Bidder will not be using Subcontractors, indicate "Not Applicable" in the appropriate spaces.

1. Principal business location of Contractor

Address*

City*

State*

Zip*

2. Locations where services will be performed by Contractor and Subcontractor (Project Sites)

Address*

City*

State*

Zip*

3. Location where state data will be accessed, tested, maintained, or backed-up by Contractor

Address*

City*

State*

Zip*

Locations where state data will be accessed, tested, maintained, or backed-up by Subcontractors if known at time of Bid deadline

Address

City

State

Zip

Bidder also affirms, understands and agrees that the Contractor and its Subcontractors are under a duty to disclose to the State any change or shift in location of services performed by the Contractor or its Subcontractors before, during and after execution of any Contract with the State. Bidder agrees it shall so notify the State immediately of any such change or shift in location of its services. The State has the right to immediately terminate the contract, unless a duly signed waiver from the State has been attained by the Contractor to perform the services outside the United States.

On behalf of the Bidder, I acknowledge that I am duly authorized to execute this electronic Bid Form including this Bidder Affirmation and Disclosure form and have read and understand that this form is a part of any Contract that Bidder may enter into with the State and is incorporated therein.

■ EDGE Program Commitment to Participate

Option A

The Bidder commits to meet or exceed the advertised EDGE Participation Goal of the Contract award amount, calculated as a portion of the Base Bid plus all accepted Alternates, by using EDGE-certified Business(es).

The Bidder agrees that if selected for consideration of the Contract, it shall provide (if not provided with the Bidder's Bid) to the Contracting Authority, at the location required and within 3 business days after receiving notice from the Contracting Authority, its fully-completed Bidder's Qualification Form, including an EDGE Affidavit form for each EDGE-certified Business proposed for use by the Bidder if awarded the Contract for this Project.

Option B (indicate percentage of participation below)

The Bidder declares that it does not meet the advertised EDGE Participation Goal percentage, but, if awarded the Contract for this Project, commits to provide the percentage of the Contract award amount, indicated above, calculated as a portion of the Base Bid plus all accepted Alternates, by using EDGE-certified Business(es).

The Bidder acknowledges it understands the requirement for it to provide and agrees to provide to the Contracting Authority, if selected for consideration of the Contract, within 3 business days after notice from the Contracting Authority, a detailed Demonstration of Good Faith form describing its efforts undertaken prior to submitting its Bid to meet the advertised EDGE Participation Goal percentage for the Contract for this Project.

The Bidder commits to provide to the Contracting Authority at the location required, and within 3 days after receiving notice from the Contracting Authority, its fully-completed Bidder's Qualifications Form, including an EDGE Affidavit form for each EDGE-certified Business proposed for use by the Bidder if awarded the Contract for this Project.

Option C

The Bidder declares that the Bidder is an EDGE-certified Business and that if awarded this Contract, the EDGE Participation percentage will be 100 percent of the Contract award amount.

Select EDGE option above*

Choices...b

If option B selected, enter percentage

■ Certifications (State Prevailing Wages)

1. The Bidder has read and understands the proposed Contract Documents and agrees to comply with all requirements of the proposed Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder, which might indicate a contrary intention.
2. The Bidder represents that the Bid is based upon the Basis of Design and Acceptable Components specified by the proposed Contract Documents.
3. The Bidder has visited the Site, become familiar with local conditions, and has correlated personal observations about the requirements of the proposed Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the proposed Contract Documents.
4. The Bidder understands that the execution of the Project will require sequential, coordinated, and interrelated operations, which may involve interference, disruption, hindrance, or delay in the progress of the Bidder's Work. The Bidder agrees that the Contract Sum, as amended from time to time, shall cover all amounts due from the State resulting from interference, disruption, hindrance, or delay that is not caused by the State or its agents and employees. The Bidder agrees that any such interference, disruption, hindrance, or delay is within the contemplation of the Bidder and the State and that the Contractor's sole remedy from the State for any such interference, disruption, hindrance, or delay shall be an extension of time in accordance with the proposed Contract Documents.
5. During the performance of the Contract, the Bidder agrees to comply with Ohio Administrative Code ("OAC") Chapters 123:2-3 through 123:2-9 and agrees to incorporate the monthly reporting provisions of OAC Section 123:2-9-01 into all subcontracts on the Project, regardless of tier. The Bidder understands the State's Equal Opportunity Coordinator or the Ohio Department of Natural Resources may conduct pre-award and post-award compliance reviews to determine if the Bidder maintains nondiscriminatory employment practices, maintains an affirmative action program, and is exerting good faith efforts to accomplish the goals of the affirmative action program. For a full statement of the rules regarding Equal Employment Opportunity in the Construction Industry, see OAC Chapters 123:2-1 through 123:2-9.
6. The Bidder and each Person submitting a Bid on behalf of the Bidder certifies, and in the case of a Bid by a joint venture each member thereof certifies as to such member's entity, under penalty of perjury, that to the best of the undersigned's knowledge and belief: (a) the Base Bid, any Unit Prices, and any Alternate bid in the Bid have been arrived at independently without collusion, consultation, communication or agreement, for the purpose of restricting competition as to any matter relating to such Base Bid, Unit Prices or Alternate bid with any other Bidder; (b) unless otherwise required by law, the Base Bid, any Unit Prices and any Alternate bid in the Bid have not been knowingly disclosed by the Bidder and shall not knowingly be disclosed by the Bidder prior to the bid opening, directly or indirectly, to any other Bidder who would have any interest in the Base Bid, Unit Prices, or Alternate bid; (c) no attempt has been made or shall be made by the Bidder to induce any other Person to submit or not to submit a Bid for the purpose of restricting competition.

7. The Bidder shall execute the Agreement with the Contracting Authority, if a Contract is awarded on the basis of this Bid, and if the Bidder does not execute the Agreement for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the State as provided in Article 5 of the Instructions to Bidders.
8. The Bidder certifies that the upon the award of a Contract, as the Contractor it shall make a good faith effort to ensure that all of the Contractor's employees, while working on the Site, shall not purchase, transfer, use, or possess illegal drugs or alcohol or abuse prescription drugs in any way.
9. The Bidder acknowledges that it read all of the Instructions to Bidders, and in particular, Section 2.10 - Submittals With Bid Form, and by submitting its Bid certifies that it has read the Instructions to Bidders and it understands and agrees to the terms and conditions stated in them.
10. The Bidder agrees to furnish any information requested by the Contracting Authority or the Architect/Engineer to evaluate the responsibility of the Bidder.
11. The Bidder agrees to furnish the submittals required by Section 6.1 of the Instructions to Bidders for execution of the Agreement within 10 days of the date of the Notice of Intent to Award.
12. When the Bidder is a corporation, partnership or sole proprietorship, an officer, partner or principal of the Bidder, as applicable, shall enter the legal name of the Bidder and the name of the officer, partner or principal of the Bidder (in lieu of signing the Bid Form) in the data fields provided.
13. When the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall enter the legal name of the applicable member and the name of the officer, partner or principal (in lieu of signing the Bid Form) in the data fields provided.
14. The Bidder understands that the Contract is subject to all the provisions, duties, obligations, remedies and penalties of Ohio Revised Code Chapter 4115 and that the Bidder shall pay any wage increase in the locality during the term of the Contract.
15. The Bidder represents that the individual that is submitting and digitally signing the electronic Bid is legally authorized to do so.
16. Bidder acknowledges that by the act of submitting an electronic Bid that it is digitally signing the actual Bid, which shall serve as the Bidder's authorization for the further consideration and activity in the bidding and contract process.



The Bidder hereby acknowledges that the above representations in this Bid are material and not mere recitals.*

■ Instructions for Providing Bid Submittals

Submission of Electronic Facsimile of Bid Guaranty with Electronic Bid

The Bidder SHALL UPLOAD and ATTACH TO ITS BID an ELECTRONIC FACSIMILE (scanned PDF document) OF ITS BID GUARANTY, payable to the Contracting Authority, in the form of either: (1) the signed and sealed Document 00 43 13 - "Bid Security Form" contained in the Contract Documents (and provided for the Bidder's convenience in the block above) for the amount of the Base Bid plus all additive Alternates; or (2) a certified check, cashier's check, or letter of credit, for 10 percent of the Base Bid, plus all additive Alternates – a letter of credit shall expressly provide that it is revocable only by the Contracting Authority. Refer to Sections 2.10.1.1 and 5.1 of Document 00 21 13 - "Instructions to Bidders."

Submission of Original Bid Guaranty

In addition to the Electronic Facsimile above, the Bidder SHALL DELIVER ITS ORIGINAL UNALTERED BID GUARANTY to Julie Endicott, Ohio Department of Natural Resources, 2045 Morse Road, Bldg E3, Columbus, OH 43229 WITHIN 3 BUSINESS DAYS AFTER THE BID DEADLINE as provided in Ohio Administrative Code Section 153:1-8-01(H). THIS REQUIREMENT APPLIES TO ALL BIDDERS. Refer to Section 2.10.1.2 of the Instructions to Bidders.

Non-responsive Bid for Failure to Submit Bid Guaranty

Each Bidder MUST SUBMIT BOTH THE ELECTRONIC FACSIMILE AND THE ORIGINAL UNALTERED BID GUARANTY as described above. The Contracting Authority SHALL REJECT A BID AS NON-RESPONSIVE if the Bidder fails to submit BOTH elements of the Bid Guaranty. The checkboxes below are to identify that you have uploaded the other form of Bid Guaranty. DO NOT CHECK ALL BOXES. Refer to Section 2.10.1 of the Instructions to Bidders.

Submission of Bidder's Qualifications and EDGE Affidavit

The Bidder is encouraged to submit background information with its Bid using Document 00 45 13 - "Bidder's Qualifications" and Document 00 45 39 - "EDGE Affidavit" with the EDGE-certified Business(es) the Bidder proposes to use on the Project (forms provided for the Bidder's convenience in the block above). If the Bidder does not submit the Bidder's Qualifications form and/or the EDGE Affidavit form and related information attached to the electronic Bid Form, the Bidder shall provide it within 3 days of request. Refer to Sections 2.10.3 and 3.5.4 of the Instructions to Bidders.

■ Procurement Forms

Document 00 43 13 - Bid Security Form

→ Upload below and provide original document within 3 days

Document 00 45 13 - Bidder's Qualifications

→ Upload below or provide within 3 days of request

Document 00 45 39 - EDGE Affidavit

→ Upload below or provide within 3 days of request

3 Attachments

■ Required Bid Guaranty Upload

Name	File*
Document 00 43 13 - Bid Security Form → Upload a scan of the fully executed Bid Security Form AND submit the original document to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Bidder submitted a Cashier's check below)
Power of Attorney → Upload a scan of the fully executed Power of Attorney AND submit the original document to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Bidder submitted a Cashier's check below OR included with the Bid Security Form above)
Cashier's Check for 10% of the Bid → Upload a scan of the Cashier's Check AND submit the original check to the Contracting Authority within 3 days of the bid deadline	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Bidder submitted the Bid Security Form AND Power of Attorney above)

3 Required Documents

■ Bidder's Qualifications and EDGE Affidavit Upload

Name	File*
Document 00 45 13 - Bidder's Qualifications → Upload fully completed form and attachments	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Must be submitted to the Contracting Authority within 3 days of request)
Document 00 45 39 - EDGE Affidavit → Upload a completed form for each EDGE business	Select file... no file selected ☐ I am NOT enclosing this document because the omission terms have been met. (Must be submitted to the Contracting Authority within 3 days of request)

2 Required Documents

■ Bidder Signatory Information

Name of Bidder's Authorized Signatory*

Title*	Company Name*	
Mailing Address*		
Telephone Number*	Facsimile Number	E-Mail Address*
Where Incorporated*	Federal Tax Identification Number*	
Date enrolled in an OBWC-approved DFSP (month/date/year)		
Contact person for Contract processing*		
President or Chief Executive Officer's Name / Title*		

Joint Venture Bidder Signatory Information**Optional Component:** I am NOT bidding on Joint Venture Bidder Signatory Information ☐

Name of Bidder's Authorized Signatory*		
Title*	Company Name*	
Mailing Address*		
Telephone Number*	Facsimile Number	E-Mail Address*
Where Incorporated*	Federal Tax Identification Number*	
Date enrolled in an OBWC-approved DFSP (month/date/year)		
Contact person for Contract processing*		
President or Chief Executive Officer's Name / Title*		

END OF DOCUMENT

Document 00 43 13 - Bid Security Form

State of Ohio Standard Requirements for Public Facility Construction

(Form of combined Bid Guaranty and Bond prescribed by Ohio Revised Code Section 153.571)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____,
_____, as Principal,
and _____ as Sureties,
are hereby held and firmly bound unto _____
_____ as Obligee(s), in the penal sum of the dollar amount of the Bid submitted by the Principal
to the Obligee on _____ (date) to undertake the Project known as:

Project Number: _____

Project Name: _____

Contract Description: _____
(e.g., General Contractor/Trades, Plumbing, HVAC, Electrical)

The penal sum, referred to herein, shall be the dollar amount of the Principal's Bid to the Obligee, incorporating any additive alternate Bids made by the Principal on the date referred to above to the Obligee, which are accepted by the Obligee. In no case shall the penal sum exceed the amount of dollars (\$ _____). (If the preceding line is left blank, the penal sum will be the full amount of the Principal's Bid, including add alternates. Alternatively, if completed, the amount stated shall not be less than the full amount of the Bid, including Alternates, in dollars and cents. A percentage is not acceptable.) For the payment of the penal sum well and truly to be made, we hereby jointly and severally bind ourselves, our heirs, executors, administrators, successors and assigns.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named Principal has submitted a Bid for the above referenced Project;

NOW, THEREFORE, if the Obligee accepts the Bid of the Principal, and the Principal fails to enter into a proper contract in accordance with the Bid, Plans, Specifications, details, and bills of material; and in the event the Principal pays to the Obligee the difference, not to exceed ten percent of the penal sum hereof between the amount specified in the Bid and such larger amount for which the Obligee may in good faith contract with the Bidder determined by the Obligee to be the next lowest responsive and responsible to perform the Work covered by the Bid; or in the event the Obligee does not award the Contract to such next lowest responsive and responsible Bidder and resubmits the Project for bidding, the Principal pays to the Obligee the difference not to exceed ten percent of the penal sum hereof between the amount specified in the Bid, or the costs, in connection with the resubmission, of printing new Contract Documents, required advertising and printing and mailing notices to prospective Bidders, whichever is less, then this obligation shall be null and void, otherwise to remain in full force and effect. If the Obligee accepts the Bid of the Principal, and the Principal, within 10 days after the awarding of the Contract, enters into a proper contract and executes the Agreement Form in accordance with the Contract Documents, including without limitation the Bid, Plans, Specifications, details, and bills of material, which said Contract is made a part of this Bond the same as though set forth herein; and

NOW ALSO, IF THE SAID Principal shall well and faithfully perform each and every condition of such Contract; and indemnify the Obligee against all damage suffered by failure to perform such Contract according to the provisions thereof and in accordance with the Contract Documents, including without limitation Plans, Specifications, details, and bills of material therefore; and shall pay all lawful claims of Subcontractors, Material Suppliers and laborers for labor performed and materials furnished in the carrying forward, performing or completing of said Contract; we, agreeing and assenting that this undertaking shall be for the benefit of any Subcontractor, Material Suppliers or laborer having a just claim, as well as for the Obligee herein; then this obligation shall be void; otherwise the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Surety for any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions or additions, in or to the terms of said Contract, the Work thereunder or the Contract Documents, including without limitation the Plans and Specifications, therefore, shall in any way affect the obligations of said Surety on its bond, and it does hereby waive notice of any such modifications, omissions or additions in or to the terms of the Contract, the Work, or the Contract Documents, including without limitation the Plans and Specifications.

SIGNED AND SEALED this _____ day of _____, _____.

PRINCIPAL:

Signature

By: _____
Name

Title

SURETY:

Signature

By: _____
Attorney-in-Fact

SURETY INFORMATION:

Name

Address 1

Address 2

City State Zip

Telephone

Email

SURETY AGENT'S INFORMATION:

Name

Address 1

Address 2

City State Zip

Telephone

Email

END OF DOCUMENT

Document 00 45 13 - Bidder's Qualifications

State of Ohio Standard Requirements for Public Facility Construction

Project Number: _____

Project Name: _____

1. Company Name: _____

Physical Address: _____
Street, Building, Unit

City, State, Zip

Mailing Address (if different): _____
P.O. Box

City, State, Zip

Telephone Number (w/ Area Code): (_____) _____

Fax Number (w/ Area Code): (_____) _____

Email address: _____

2. **Overall Experience.** Indicate Bidder's overall experience performing the trades bid, including the years in business performing the trade under present and former business names.

3. **Financial.** The apparent low Bidder shall submit, upon request of the Contracting Authority, either:

- a) An annual financial statement prepared within the 12 months prior to the bid opening by an independent licensed accounting firm; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking; or,
- b) A financial report generated within 30 days prior to the bid opening from Standard and Poor, Dun and Bradstreet or a similar company acceptable to the Contracting Authority documenting the financial condition of the Bidder; and the name, address, contact person and phone number of the bank normally used by the Bidder for its primary banking;

This information is not a public record under Ohio Revised Code Section 149.43; and shall remain confidential, except under proper order of a court.

- 4. Facilities & Equipment.** Indicate Bidder's relevant facilities and major equipment (leased or owned).
- 5. Ongoing & Relevant Projects.** List all ongoing projects and projects completed in the last 5 years, which are similar in cost and type to the Project. Include scope of Work, Contract value, a description of EDGE participation and performance, and project name/contact person/address/phone number for each owner and the architect or engineer for each project.
- 6. Regulatory / Contractual.** Indicate all occurrences of the following in the last 5 years (indicate if none). For verification, attach documentation, and/or provide sufficient and appropriate detail information such as: project name, owner, contact person and phone number, amount of contract, etc.
- a) State or federal Prevailing Wage violations or judgments
 - b) Affirmative Action and EDGE program violations (Attach Certificate of Compliance with Affirmative Action Programs, issued pursuant to Ohio Revised Code Section 9.47)
 - c) Contract abandonment, contract termination, as either a prime- or sub-contractor, or Surety takeover
 - d) Debarment by state, federal, or local jurisdictions

e) EPA/OSHA violations

f) Liquidated damages and Statutory Delay Forfeiture assessed

g) Drug-Free Safety Program and Drug Free Workplace Program violations

7. Management. Identify individuals assigned to this Project.

Principal _____ Years with firm _____ Total Exp. _____

Project Manager _____ Years with firm _____ Total Exp. _____

Field Superintendent _____ Years with firm _____ Total Exp. _____

8. EDGE Participation. Identify EDGE-certified Business Enterprises proposed as Subcontractors and Material Suppliers for this Project. Attach a fully completed Document 00 45 39 - "EDGE Affidavit" for each EDGE-certified Business Enterprise.

9. Certification. I hereby certify that the information in this entire Bidder's Qualifications form, including all attachments and referenced information, is factual and complete.

Company Name _____

Authorized Official (please print or type) _____

Signature of Authorized Official _____ Date _____

END OF DOCUMENT

Document 00 45 39 - EDGE Affidavit

State of Ohio Standard Requirements for Public Facility Construction

EDGE PARTICIPATION

Certified Statement of Intent to Contract and Perform

Bidder or Proposer: Submit one fully completed form for each EDGE-certified Business

Project: _____

Project Name: _____

A. Bidder or Proposer's Company Name: _____

Mark all that apply:

☐ Multi-Prime Contract ☐ General Contract ☐ CM at Risk Contract ☐ Design-Build Contract

B. EDGE-certified Business information (for contract at ANY tier)

Mark all that apply:

☐ Subcontractor ☐ Material Supplier ☐ Professional Services ☐ Goods & Services

EDGE Business Name: _____

EDGE Business Address: _____

EDGE Certification Number: _____ E-mail: _____

Contact Person: _____ Phone: _____

Insert detailed description of materials, labor, services, supplies, etc. (may use industry codes – continue on separate page):

C. Certification of Intent

By signing below, the Bidder or Proposer certifies that it intends to contract with the EDGE-certified Business for the portion of the contract described above related to its Contract for this Project and for the estimated cost shown below. By signing below, the EDGE-certified Business certifies that it intends to contract with the Bidder or Proposer and intends to provide the portion of the contract described above related to the Contract for this Project for the estimated cost of:

_____ and _____ /100 dollars (\$ _____).

In the event the named Bidder or Proposer is NOT awarded a Contract, this Statement shall be null and void.

EDGE-certified Business

Bidder or Proposer

Authorized Signature

Authorized Signature

Name and Title

Name and Title

Date Signed

Date Signed

END OF DOCUMENT

Document 00 52 00 - Agreement Form

State of Ohio Standard Requirements for Public Facility Construction

This Agreement is made as of the date set forth below between the State of Ohio, acting by and through the Contracting Authority, and the Contractor in connection with the Project.

Project Number: DNR-250013
Project Name: Grand Lake St. Marys Park Office
Site Address: 834 Edgewater Dr
St Marys, OH 45885

Owner: Ohio Department of Natural Resources
Owner's Representative: Eric Moser
Address: 2045 Morse Rd, E-3
Columbus, OH 43229

Contracting Authority: Ohio Department of Natural Resources
Division of Engineering
Project Manager: Eric Moser
Address: 2045 Morse Rd, E-3
Columbus, OH 43229

Contractor: «insert name»
Contractor's Principal Contact: «insert name»
Address: «insert street address»
«insert city, state zip code»

Architect/Engineer ("A/E"): Buehrer Group Architecture & Engineering, Inc.
A/E's Principal Contact: Michael Rowe
Address: 314 Conant Street
Maumee, OH 43537

ARTICLE 1 - SCOPE OF WORK; EDGE COMMITMENT

- 1.1** The Contractor shall perform and provide all the Work described in the Contract.
- 1.2** The project delivery method for this Project shall be General Contracting.
- 1.3** The Contractor shall contract with EDGE-certified Business(es) for not less than «insert Contractor's EDGE commitment» percent of the Contract Sum.

ARTICLE 2 - COMPENSATION

2.1 The Owner shall pay the Contractor the Contract Sum for the Contractor's proper, timely, and complete performance of the Contract. The Contract Sum is \$«insert amount», subject to Modifications as provided in the Contract Documents. The Contract Sum is comprised of the following:

- 2.1.1** Base Bid:\$«Insert Base Bid Amount»
- 2.1.2** Alternate «Insert Alternates Awarded»:\$«Insert Alternate Amount»
- 2.1.3** Alternate «Insert Alternates Awarded»:\$«Insert Alternate Amount»
- 2.1.4** Alternate «Insert Alternates Awarded»:\$«Insert Alternate Amount»

ARTICLE 3 - CONTRACT TIMES

3.1 The Contract Times are the periods established in the following table for the achievement of the associated Milestones:

Construction Stage Milestone(s) to which Liquidated Damages apply	Contract Time	Projected Date (as of the date of this Agreement)
Construction Completion	411 days	April 2, 2027
Substantial Completion of all Work	501 days	May 31, 2027

3.1.1 The projected dates listed under “Projected Date (as of the date of this Agreement)” are provided only for convenient reference during consideration of the Agreement. The durations listed under “Contract Time” define the Contract Times and take precedence over the projected dates.

3.1.2 See specification 01 32 16-5 for additional detail on milestones.

ARTICLE 4 - KEY PERSONNEL

4.1 The Contractor’s key personnel for the Project are:

- 4.1.1** «insert name», Project Manager;
- 4.1.2** «insert name», Lead Scheduling Engineer;
- 4.1.3** «insert name», General Superintendent.

4.2 The Contractor’s key personnel are authorized to act on the Contractor’s behalf with respect to the Project and all matters concerning the Project.

ARTICLE 5 - GENERAL PROVISIONS

5.1 Effectiveness.

5.1.1 It is expressly understood by the Contractor that none of the rights, duties, and obligations described in the Contract Documents shall be valid and enforceable unless the Director of the Office of Budget and Management first certifies that there is a balance in the Owner’s appropriation not already encumbered to pay existing obligations and until all relevant statutory provisions of the Ohio Revised Code, including ORC Section 126.07, have been complied with, and until such time as all necessary funds are available or encumbered and, when required, such expenditure of such funds is approved by the State Controlling Board, or other applicable approving body.

5.1.2 In addition, if federal funds are to be used to pay fees and expenses under this Agreement, none of the rights, duties, and obligations contained in this Agreement shall be binding on any party until the Owner gives the Contractor written notice that such funds are available from the Owner’s funding source.

5.1.3 Subject to **Section 5.1.1**, the Contract shall become binding and effective upon execution by the Contracting Authority, Owner, Contractor, and Ohio Attorney General.

5.1.3.1 If the Contractor is a joint venture, **(1)** each individual joint venturer shall **(a)** sign the Agreement in its own name and **(b)** be a party to the Contract, and **(2)** the Contract and the Performance and Payment Bond shall be binding on and apply to all joint venturers jointly and severally.

5.1.3.2 If the Contractor is a limited liability company, which the Contracting Authority reasonably believes to be a special purpose or similar entity, the Contracting Authority may in its discretion require the limited liability company and each member of the limited liability company to **(1)** sign the Agreement in its own name and **(2)** be a party to the Contract. In that case, the Contract and the Performance and Payment Bond shall be binding on and apply to the limited liability company and to all its members jointly and severally.

5.1.4 This Agreement may be executed in several counterparts, each of which shall constitute a complete original Agreement, which may be introduced in evidence or used for any other purpose without production of any other counterparts.

5.2 Representations.

5.2.1 The Contractor represents and warrants that it is not subject to an unresolved finding for recovery under ORC Section 9.24. If this representation and warranty is found to be false, the Contract is void, and the Contractor shall immediately repay to the Owner any funds paid under this Contract.

5.2.2 The Contractor hereby certifies that neither the Contractor nor any of the Contractor's partners, officers, directors, shareholders nor the spouses of any such person have made contributions in excess of the limitations specified in ORC Section 3517.13.

5.2.3 The Contractor, by signature on this Agreement, certifies that it is currently in compliance with, and will continue to adhere to, the requirements of Ohio ethics laws and conflict of interest laws and will take no action inconsistent with those laws.

5.2.4 The Contractor affirms to have read and understands Executive Order 2019-12D and shall abide by those requirements in the performance of this Contract. Notwithstanding any other terms of this Contract, the State reserves the right to recover any funds paid for services the Contractor performs outside of the United States for which it did not receive a waiver. The State does not waive any other rights and remedies provided the State in this Contract.

5.2.5 The Contractor affirms to have read and understands Executive Order 2022-02D regarding the prohibition of purchases from or investment in a Russian institution or company and shall abide by those requirements in the performance of this Contract. Notwithstanding any other terms of this Contract, the State reserves the right to recover any funds paid to the Contractor for purchases or investments in a Russian institution or company in violation of this paragraph. The provisions of this paragraph will expire when the applicable Executive Order is no longer effective.

5.2.6 During the performance of this Contract, if the Contractor changes the location(s) disclosed on the **Affirmation and Disclosure Form** (a page in its **Bid Form**), the Contractor must complete and submit a revised **Affirmation and Disclosure Form**.

5.2.7 Pursuant to ORC Section 9.76(B), the Contractor warrants that it is not boycotting any jurisdiction with whom the State of Ohio can enjoy open trade, including Israel, and will not do so during the term of this Contract.

ARTICLE 6 - Enumeration of Documents

6.1 The Contract Documents constitute the substance of the Contract, and include this Agreement, Drawings, Specifications, Addenda if any, **Contracting Definitions**, **General Conditions**, Supplementary Conditions if any, **Bid Form**, **Wage Rate Requirements**, **Bid Guaranty and Contract Bond** or **Performance and Payment Bond**, and Change Orders if any.

SIGNATURES

IN WITNESS WHEREOF, the parties hereto have executed this Agreement as of the date set forth below:

«INSERT CONTRACTOR'S NAME»

STATE OF OHIO
Department of Natural Resources

Signature

Signature

Printed Name

Printed Name

Title

Title

Date

OHIO ATTORNEY GENERAL
Approval as to Form

Signature

Printed Name

Title

Date

END OF DOCUMENT



**Department of
Natural Resources**
ohiodnr.gov

Mike DeWine, Governor
Jim Tressel, Lt. Governor
Mary Mertz, Director

Division of Engineering
Jeremy Wenner, Chief
2045 Morse Road, Building E3
Columbus, OH 43229
(614) 265-

[Date]

[Contractor Point of Contact]

[Contractor name and address]

RE: Escrow Waiver
Project Number and Name

Dear [Point of Contact]:

This correspondence regards [Project number and name]. The General Conditions for the Project require establishment of an escrow account for certain payments. The Ohio Department of Natural Resources, Division of Engineering, inquires whether [Contractor name] is interested in waiving this requirement and proceeding without the escrow account. You may be interested in such waiver for the following reason[s]:

[Include one or more of the following reasons and delete any that are inapplicable]

- (1) Every escrow account that is created with the escrow bank is charged a fee of \$150 and, for the subject Project, the fee may exceed the amount of any interest that may be earned from the escrowed retainage.
- (2) The duration of the Project is so brief that any amount of interest earned from the escrowed retainage will be de minimus after subtracting the \$150 fee.
- (3) Because the Project is anticipated to reach substantial completion within a few months and the Contract is 50 percent complete, the \$150 fee for opening the escrow account will exceed any interest earned from the escrowed retainage.

Please note that the decision whether to waive the escrow requirement for this Project is within the discretion of [Contractor name]. If [Contractor name] would like to waive the escrow requirement for this Project, please acknowledge the waiver by signing and dating below and returning a copy of this signed letter by email to [provide ODNR point of contact and email address].

I, _____ name _____ the _____ title _____ for _____ name of contractor _____ hereby waive the requirement under the General Conditions of the Contract Documents for Project [Number] for retainage to be deposited in an escrow account.

Signature _____

Date _____

Sincerely,

[NAME]
Project Manager
Ohio Department of Natural Resources
(614) 265-xxxx
First.Last@dnr.ohio.gov

Document 00 52 14 - State of Ohio Subcontract Form
State of Ohio Standard Requirements for Public Facility Construction

This Agreement is made as of the date set forth below between the Contractor and the Subcontractor in connection with the Project.

Project Number: DNR-250013
Project Name: Grand Lake St. Marys Park Office
Site Address: 834 Edgewater Dr
St Marys, OH 45885

Contractor: «insert name»
Contractor's Principal Contact: «insert name»
Address: «insert street address»
«insert city, state zip code»

Subcontractor: «insert name»
Subcontractor's Principal Contact: «insert name»
Address: «insert street address»
«insert city, state zip code»

Public Authority: Ohio Department of Natural Resources
Division of Engineering
Public Authority Contact: Eric Moser
Address: 2045 Morse Road, E-3
Columbus, OH 43229

ARTICLE 1 - NATURE OF SUBCONTRACT

1.1 The Subcontractor shall perform the entire Subcontract Work as specified in Exhibit «N» and described in the Contract Documents for the Project.

ARTICLE 2 - COMPENSATION

2.1 The Contractor agrees to pay for the performance of this Subcontract, subject to additions and deductions as provided in the Contract Documents, the Subcontract Sum of «insert Subcontract Sum», comprised of the following:

«insert Subcontract Sum component».....\$«insert amount»
«insert Subcontract Sum component».....\$«insert amount»
«insert Subcontract Sum component».....\$«insert amount»
«insert Subcontract Sum component».....\$«insert amount»

ARTICLE 3 - TIME OF PERFORMANCE

3.1 Time is of the essence. The Subcontractor shall diligently prosecute and complete all Subcontract Work in accordance with the construction progress schedule agreed between the parties.

ARTICLE 4 - CONTRACT DOCUMENTS

- 4.1** To the extent that the contract between the Public Authority and the Contractor applies to the Subcontract Work:
- 4.1.1** The Contractor and the Subcontractor agree to be mutually bound by the terms of the Contract Documents;
 - 4.1.2** The Contractor assumes toward the Subcontractor the rights, remedies, obligations, and responsibilities that the Public Authority has and assumes toward the Contractor;

4.1.3 The Subcontractor assumes toward the Contractor the rights, remedies, obligations, and responsibilities that the Contractor assumes toward the Public Authority; and

4.1.4 The Subcontractor agrees to perform its portion of the Work in accordance with the Contract Documents.

4.2 The Subcontract and any modifications, amendments, or alterations thereto shall be governed, construed, and enforced by and under the laws of the State of Ohio.

4.3 If any term or provision of the Subcontract, or the application thereof to any Person or circumstance, is finally determined, to be invalid or unenforceable by a court of competent jurisdiction, the remainder of the Subcontract or the application of such term or provision to other Persons or circumstances, shall not be affected thereby, and each term and provision of the Subcontract shall be valid and enforced to the fullest extent permitted by law.

4.4 The Subcontract shall be binding on the Contractor and Subcontractor, their successors and assigns, in respect to all respective covenants and obligations contained in the Contract Documents, but the Subcontractor may not assign the Subcontract without the prior written consent of the Contractor and the Public Authority.

ARTICLE 5 - EFFECTIVENESS

5.1 The Subcontract shall become binding and effective upon execution by the Contractor.

5.2 This Subcontract has been executed in several counterparts, each of which shall constitute a complete original Subcontract, which may be introduced in evidence or used for any other purpose without production of any other counterparts.

5.3 Any signatory may deliver a copy of its counterpart signature page to this Subcontract via fax or e-mail. Each signatory shall be entitled to rely upon a signature of any other signatory delivered in such a manner as if such signature were an original.

ARTICLE 6 - REPRESENTATIONS

6.1 Contingent Assignment. The Contractor's contingent assignment of this Subcontract to the Public Authority, as provided in the Contract, is effective after termination of the Contractor by the Public Authority and the Public Authority's acceptance of the assignment in writing to the Subcontractor. The Subcontractor consents to the assignment and shall be bound at the same price and terms as in the Subcontract to the Public Authority. Unless the Public Authority takes assignment of the Subcontract, the Subcontractor will not have any contractual rights against the Public Authority.

6.2 Intended Third-Party Beneficiary. The Public Authority is an intended third party beneficiary of the Subcontract, entitled to enforce any rights thereunder for its benefit.

6.3 Insurance. The Subcontractor shall maintain insurance in accordance with the Contract Documents. Exhibit «N» sets forth the minimum limits of liability for the insurance required in the Contract Documents.

6.4 Right to Audit. The Subcontractor agrees that the Public Authority or any agents designated by the Public Authority have access to and the right to audit and the right to copy at the Public Authority's cost all of the Subcontractor's books, records, contracts, correspondence, instructions, drawings, receipts, vouchers, purchase orders, and memoranda relating to the Work for a period of not less than 3 years following completion of the Work consistent with Ohio Revised Code ("ORC") Section 149.43 with regard to the Public Authority's obligation to maintain confidentiality of trade secrets.

6.5 Indemnity. To the fullest extent permitted by law, the Subcontractor shall indemnify, defend, and hold harmless the Public Authority, the Contractor, their consultants and employees from all claims and expenses for bodily injury and property damage other than to the Work itself that may arise from the performance of the Subcontract Work, including reasonable attorneys' fees, costs and expenses, but only to the extent caused by the negligent acts or omissions of the Subcontractor or a person or entity for whom the Subcontractor may be liable. This Subcontract does not require a Subcontractor to waive its immunity under the Workers Compensation laws of Ohio from claims brought against the Subcontractor by the Subcontractor's employees.

6.6 Prompt Pay. The Contractor shall at a minimum make payments to the Subcontractor in accordance with Applicable Law, including ORC Section 4113.61. Progress payments to the Subcontractor for satisfactory performance of Subcontract Work shall be made no later than 10 days after receipt by the Contractor of payment from the Public Authority for Subcontract Work.

6.7 Retainage. Subcontractor retainage shall be at a rate equal to the percentage retained from the Contractor's payment by the Public Authority for the Subcontract Work, unless a lesser percentage is otherwise specified.

6.7.1 Labor Payments.

6.7.1.1 Partial payments to the Subcontractor for labor performed shall be made at the rate of 92 percent of the amount invoiced through the Subcontractor's request for payment that shows the Work of the Subcontractor is 50 percent complete.

6.7.1.2 After the Work of the Subcontractor is 50 percent complete, as evidenced by payments of at least 50 percent of the total amount due under the Subcontract, no additional funds shall be retained from payments for labor.

6.7.2 Material Payments.

6.7.2.1 The Contractor shall pay the Subcontractor at the rate of 100 percent of the scheduled value for materials incorporated into the Project.

6.7.2.2 The Contractor shall pay the Subcontractor at the rate of 92 percent of the invoice cost, not to exceed the scheduled value, for materials delivered to the Site, or other off-site storage location approved by the A/E, provided the Subcontractor provides the following information with its request for payment:

- .1** a list of the fabricated materials consigned to the Project, giving the place of storage, together with copies of invoices, in order to verify quantity and cost; and
- .2** a certification of materials stored off-site, prepared by the Subcontractor and signed by the A/E to evidence that the materials are in conformity with the Specifications and have been tagged with the Project name and number for delivery to the Project. The Subcontractor shall reimburse the A/E, through the Contractor, for all costs incurred to visit a storage site, other than the areas adjacent to the Project.
- .3** The Contractor shall pay the balance of the scheduled value when the materials are incorporated into and become a part of the Project.

6.8 Warranty. The Subcontractor fully warrants, for the benefit of the Public Authority, that all materials and equipment shall be new unless otherwise specified, of good quality, in conformance with the Contract Documents and free from defective workmanship or materials.

6.9 Non-Waiver of Lien Rights or Payment Bond Rights. This Subcontract shall not prohibit a Subcontractor from exercising its rights under ORC Chapter 1311 or under any Contractor-provided payment bond.

6.10 Non-Discrimination. The Subcontractor agrees to fully comply with Applicable Law regarding equal opportunity, including ORC Section 153.59 and, to the extent applicable, all Executive Orders issued by the Governor of the state of Ohio.

6.11 Dispute Resolution. The supplemental conditions to this Subcontract shall provide for a dispute resolution process comparable to the Contract's dispute resolution process in terms of timing, notice, substantiation, and informal dispute resolution efforts. The dispute resolution process provided in the supplemental conditions shall result in prompt access to the ultimate dispute resolution mechanism selected by the parties.

6.12 In the event that any supplemental conditions or other Subcontract terms conflict with the **State of Ohio Subcontract Form**, the **State of Ohio Subcontract Form** takes precedence and this Subcontract shall be read and enforced to include the provisions of the **State of Ohio Subcontract Form**.

6.13 The following exhibits are attached to and are a part of this Subcontract:

6.13.1 Exhibit A:

6.13.2 Exhibit B:

6.13.3 Exhibit C:

6.13.4 Exhibit D:

SIGNATURES

IN WITNESS WHEREOF, the parties have executed this Subcontract Form.

«INSERT SUBCONTRACTOR'S NAME»

«INSERT CONTRACTOR'S NAME»

Signature

Signature

Printed Name

Printed Name

Title

Title

Date

END OF DOCUMENT

Document 00 61 13 - Performance and Payment Bond Form

State of Ohio Standard Requirements for Public Facility Construction

(Form of Bond prescribed by Ohio Revised Code Section 153.57 - Not to be used as Bid Guaranty)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____, as Principal,
and _____ as Sureties,
are hereby held and firmly bound unto _____
_____ as Oblige(e)s, in the penal sum of _____ dollars,
for the payment of which well and truly to be made, we jointly and severally bind ourselves, our heirs, executors,
administrators, successors, and assigns.

SIGNED AND SEALED this _____ day of _____, _____.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH, that whereas the above-named Principal did on the
_____ day of _____, _____, enter into a Contract with the Oblige(e), which said Contract is
made a part of this Bond the same as though set forth herein and which is more fully described as:

Project Number: _____

Project Name: _____

Contract Description: _____
(e.g., General Trades, Plumbing, HVAC, Electrical)

NOW, THEREFORE, if the above-named Principal shall well and faithfully do and perform the things agreed by the
Oblige(e) to be done and performed according to the terms of said Contract; and shall pay all lawful claims of Subcontractors,
Material Suppliers, and laborers, for labor performed and materials furnished in the carrying forward, performing, or
completing of said Contract; we agreeing and assenting that this undertaking shall be for the benefit of any Subcontractor,
Material Supplier or laborer having a just claim as well as for the Oblige(e) herein; then this obligation shall be void; otherwise
the same shall remain in full force and effect; it being expressly understood and agreed that the liability of the Sureties for
any and all claims hereunder shall in no event exceed the penal amount of this obligation as herein stated.

THE SAID Surety hereby stipulates and agrees that no modifications, omissions, or additions, in or to the terms of
the said Contract or in or to the Plans and Specifications therefor shall in any wise affect the obligations of said Surety on its
bond, and it does hereby waive notice of any such modifications, omissions or additions in or to the terms of the Contract, the
Work or the Contract Documents, including without limitation the Plans and Specifications.

PRINCIPAL:

Principal SignatureBy:

Title:

SURETY:

Surety SignatureBy:

Attorney-in-Fact**SURETY INFORMATION:**

Street

City State Zip

Telephone Number**SURETY AGENT'S INFORMATION:**

Agency Name

Street

City State Zip

Telephone Number

Email Address**END OF DOCUMENT**

Document 00 61 13.19 - Acknowledgement of Surety (General Contracting)
State of Ohio Standard Requirements for Public Facility Construction

Project Number: _____

Project Name: _____

Owner: _____

Contracting Authority: _____

Contractor: _____

Surety Name: _____

Performance & Payment Bond No.: _____

Original Penal Sum: _____

As required under the Contract between the State of Ohio, acting by and through the Contracting Authority, and the Contractor in connection with the Project, the Surety hereby acknowledges that the Penal Sum of the above-mentioned Bond has been increased to \$_____ (*must be not less than 100% of the Contract Sum*).

SURETY:

SURETY INFORMATION:

Surety Signature

Street

By: _____
Attorney-in-Fact

City State Zip

Date

Telephone Number

SURETY AGENT'S INFORMATION:

Agency Name

Street

City State Zip

Telephone Number

END OF DOCUMENT

Certified Payroll Report (Prevailing Wage)

☐ CHECK IF CORRECTED

State of Ohio Standard Forms for Public Facility Construction

EMPLOYER NAME AND ADDRESS			NAME OF GENERAL / PRIME CONTRACTOR			PROJECT NAME AND LOCATION (COUNTY)			CONTRACTING PUBLIC AUTHORITY / OWNER						
CHECK IF SUBCONTRACTOR ¹ ☐			WEEK ENDING _____			PAYROLL NUMBER _____ PAGE ² _____ of _____			PROJECT / CONTRACT NUMBER _____						
1. NAME, CURRENT ADDRESS, ³ AND LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER		2. WORK ⁴ CLASSIFI- CATION	3. RACE AND SEX	4. HOURS WORKED - DAY AND DATE		5. TOTAL PROJ HRS	6. BASE WAGE RATE	7. PROJ GROSS WAGES	8. FRINGES: CASH ☐ APPROVED PLANS ☐ CASH AND APPROVED PLANS ☐		9. TTL HRS ALL JOBS	10. TOTAL GROSS ALL JOBS	11. TAXES WITH- HELD	12. OTHER DEDUC- TIONS	13. NET WAGES PAID
									H&W	PENS	VAC	APP	OTHER		
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My signature on this form signifies that (1) I pay, or supervise the payment of the employees shown above; (2) during the pay period reported on this form, all hours worked on this Project have been paid at the appropriate prevailing wage rate for the class of work done; (3) the fringe benefits have been paid as indicated above; (4) no rebates or deductions have been or will be made, directly or indirectly from the total wages earned, other than permissible deductions as defined in Ohio Revised Code Chapter 4115; and (5) apprentices are registered with the U.S. Department of Labor, Bureau of Apprenticeship and Training. I understand that the willful falsification of any of the above statements may subject the Contractor or Subcontractor to civil action or possible criminal prosecution.

Type or Print Name and Title: _____ Signature: _____ Date: _____

Document 00 71 00 - Contracting Definitions (General Contracting Project)

State of Ohio Standard Requirements for Public Facility Construction

Acceptable Component	A component listed in the Specifications after the Basis of Design Component.
Addenda or Addendum	Written or graphic instrument issued prior to the bid opening which modifies or interprets the proposed Contract Documents by additions, deletions, clarifications, or corrections. Addenda become part of the Contract Documents when the Agreement is executed.
ADR	See “Alternative Dispute Resolution.”
A/E	See “Architect/Engineer.”
Agreement	The form furnished by the Contracting Authority (including all of its exhibits) that, when completed and signed by the Contractor and Contracting Authority evidences entry into the Contract.
Allowance	A sum stipulated in the Contract Documents for a defined scope of the Work that may not be completely defined at the time of bidding. Allowance amounts do not include the Contractor’s Fee on account of the associated Work.
Alternate	A change in the proposed Project scope, which may include but is not limited to alternate materials or methods of construction, and an amount stated on the Bid form to be added to or deducted from the Base Bid if the corresponding Alternate is incorporated into the Contract.
Alternative Dispute Resolution	A voluntary and non-binding process for the administrative review, consideration, and attempted settlement of a dispute, without resort to judicial process, including but not limited to partnering, negotiation, mediation, impartial fact-finding, dispute review board, and mini-trials, but shall not include arbitration.
Applicable Law	All federal, state, and local codes, statutes, ordinances, and regulations that apply to the performance of the Work or the A/E’s Services on the Project.
Architect/Engineer	The Person responsible for providing professional design services and construction contract administration for the Project as provided in the Contract Documents. The A/E shall be a (1) registered architect holding a license and certificate of authorization issued by the Ohio Architects Board pursuant to ORC Chapter 4703, (2) landscape architect holding a license and certificate of authorization issued by the Ohio Landscape Architects Board pursuant to ORC Chapter 4703, or (3) professional engineer or professional surveyor holding a license and certificate of authorization issued by the Ohio Engineers and Surveyors Board pursuant to ORC Chapter 4733.
As-Built Documents	Documents, including but not limited to Drawings, Addenda, Specifications, Modifications, and other elements of the Contract Documents which the Contractor annotates and otherwise modifies to indicate changes made during the construction process, the location of concealed and buried items, and other information useful to the Owner throughout the life of the completed Project.
Base Bid	The amount stated in a Bid as the sum for which the Bidder offers to perform the Work in a particular trade or other category, which is described in the Contract Documents, excluding Alternates.
Basis of Design	A document that records the concepts, calculations, decisions, and product selections used to meet the Owner’s Project Requirements and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
Basis of Design Component	A component listed first in the Specifications.

Bid	A written proposal to perform a Contract, submitted on a completed Bid Form, accompanied by other required documents. The term Bid includes a proposal that has been digitally signed, encrypted, and submitted through the State's electronic bidding application pursuant to OAC Section 153:1-8-01.
Bidder	A Person that submitted a Bid.
BIM	See "Building Information Model."
Bid Form	A form furnished by the Contracting Authority with the proposed Contract Documents that is to be completed, signed, and submitted containing the Bidder's Bid.
Bid Guaranty	A bid bond or other instrument of security authorized by ORC Section 153.54 submitted with the Bid to provide assurance that the Bidder will execute the Agreement.
Bond	A performance and payment bond in the format specified by ORC Section 153.57 submitted by the Contractor to provide assurance that the Contractor will perform the Work of the Contract, including making required payments to Subcontractors and Materials Suppliers.
Building Information Model	A digital representation of physical and functional characteristics of a facility; a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life-cycle, which is defined as existing from earliest conception to demolition; electronic files used to design and coordinate the Project; and may be used to describe a single model or multiple models used in the aggregate.
Certificate of Contract Completion	A form used to document that the Contractor's achievement of Contract Completion. This form may also be used to document partial Contract Completion.
Certificate of Substantial Completion	A form used to document (1) that the Contractor has achieved Substantial Completion of the Work or a designated portion of the Work for which the Contracting Authority and the Owner have agreed to take Partial Occupancy, and (2) the date on which the associated Substantial Completion of the Work was achieved.
Change Directive	A written document prepared by the A/E and executed by the Contracting Authority that directs a change in the Work.
Change Order	A document recommended by the A/E and executed by the Contracting Authority and the Contractor that modifies the Contract.
Claim	A demand or assertion, initiated by written notice, certified by one of the parties to the Contract seeking, as a matter of right, adjustment or interpretation of Contract terms, payment of money, extension of time, or other relief with respect to the terms of the Contract.
Commission	See "Ohio Facilities Construction Commission."
Commissioning Agent	The Person identified by the Contracting Authority who leads, plans, schedules, and coordinates the commissioning team to implement the Commissioning Process for the Project.
Commissioning Plan	A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the Commissioning Process.
Commissioning Process	A quality-focused process for enhancing the delivery of a project. The process focuses on verifying and documenting that the facility and all of its systems are planned, designed, installed, tested, operated, and maintained to meet the Owner's Project Requirements.

Commissioning Report	A document that records the activities and results of the Commissioning Process. The Commissioning Report is developed from the final Commissioning Plan with its attached appendices.
Conformed Documents	Contract Documents with all Addenda items and accepted Alternates incorporated by the A/E, published, and issued to a successful Bidder for its use during performance of the Contract. The Conformed Documents are furnished solely for the Contractor's convenience. In the event of any conflict between the Contract Documents modified by Addenda and the Conformed Documents, the Contract Documents take precedence.
Construction Budget	The amount identified in the Agreement as adjusted by the Owner and Contracting Authority.
Construction Cost	The sum of the Contract Cost amounts for a phase of the Project.
Construction Progress Schedule	The critical path schedule for performance of the Contract; showing the time for completing the Work within the Contract Times; the planned sequence for performing the various components of the Work; the interrelationship between the activities of the Contractor, A/E, Contracting Authority, and Owner; and the Contractor's resource and cost loading information; as periodically updated during the performance of the Work.
Contract	The state of legal obligation entered into by the State and the Contractor, whereby they have agreed to an exchange of certain acts, materials, equipment, and services for certain monetary consideration, under all terms and conditions specified in the Contract Documents, which shall remain in full force and effect until such time as all obligations under the Contract have been lawfully and completely discharged, or the Contract is terminated under other conditions specified in the Contract Documents.
Contract Completion	The schedule Milestone in the progress of any Phase when the Work is completed in accordance with the terms of the Contract Documents and Contractor has satisfied all of its other obligations under the Contract Documents, including but not limited to (1) all governmental authorities have given final, written approval of the Work, (2) a final unconditional certificate of occupancy has been granted and issued to the Owner by the appropriate governmental authorities, (3) the Contractor's Work is 100 percent complete, and (4) all Punch List items have been completed or corrected, and (5) the Contractor has complied with conditions precedent to final payment and release of retained funds.
Contract Documents	Collectively, the documents that constitute the substance of the Contract including Drawings, Specifications, Addenda if any, General Conditions, Supplementary Conditions if any, Bid Form, Wage Rates; and the executed Agreement, Bid Guaranty and Contract Bond, and Modifications if any.
Contract Sum	The Contract Sum is the Contractor's entire compensation for the Contractor's proper, timely, and complete performance of the Work and is subject to adjustment as provided in the Contract.
Contract Times	The periods stipulated in the Agreement for the achievement of associated Milestones, in consecutive days, beginning on the date established by the Notice to Proceed, including adjustments authorized by executed Change Orders.
Contracting Authority	The party identified as such in the Agreement, which may be the Ohio Facilities Construction Commission; an agency of the state of Ohio; an Institution of Higher Education or division thereof; a School District Board; or the legislative body of a political subdivision.
Contractor	A firm, which is party to the Contract for the performance of Work on the Project in accordance with the Contract Documents.
Contractor's Documents	All Project-related documents, including those in electronic form, prepared by the Contractor and its Subcontractors.

Contractor's Fee	The portion of the Contract Sum attributable to the aggregate of the Contractor's profit and home-office overhead related to the Contractor's proper, timely, and complete performance of the Work.
Contractor Payment Request	The form furnished by the Commission that is to be used by the Contractor in requesting payments and which, when signed by the Contractor, shall serve as an affidavit that payments requested are in proportion to the Work completed as shown on the Schedule of Values.
Contractor's Punch List	A document prepared by the Contractor that consists of a list of items of Work to be completed or corrected by the Contractor as a condition precedent to Contract Completion.
Coordination Drawings	Drawings and Electronic Files prepared by the Contractor to demonstrate how multiple-system and interdisciplinary work will be coordinated. Clash reports generated by BIM authoring software may be included in the Coordination Drawing submittals if applicable.
Correction Period	A period of one year commencing on the date of Substantial Completion of the Work or a designated portion of the Work which the Contracting Authority and Owner have agreed to take Partial Occupancy.
CxA	See "Commissioning Agent."
Date of Commencement	The date established in a Notice to Proceed issued by the Contracting Authority to the Contractor to mark the start of the Work and the beginning of the running of the Contract Times.
day	A calendar day of 24 hours measured from midnight to midnight, unless otherwise expressly specified to mean a business day.
Defective Work	Work that does not conform to the Contract Documents; or does not meet the requirements of any applicable statute, rule or regulation, inspection, reference standard, test or approval; or has been damaged prior to the A/E's recommendation of final payment, unless responsibility for the protection thereof has been expressly assumed by the Owner; or that is not free from defects in workmanship, materials, or equipment during the period of any warranty or guarantee.
Differing Site Condition	Either (1) a subsurface or otherwise concealed physical condition encountered at the Site that differs materially from the conditions indicated in the Contract Documents or (2) an unknown physical condition of an unusual nature encountered at the Site that differs materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents.
Dispute Review Board	A form of Alternative Dispute Resolution that is typically comprised of three members, selected jointly by the Contractor and the Contracting Authority, to monitor the progress of construction and provide recommended resolutions to disputes that are brought before them.
Drawings	Graphic portions of the Contract Documents, showing the design, type of construction, location, dimension, and character of the Work to be provided by the Contractor, which generally includes plans, elevations, sections, details, schedules, diagrams, notes, and text.
Electronic File	Information maintained in a computer system or format that is intended to facilitate a Person's use and manipulation of the information including but not limited to Word, Excel, PDF, Primavera, CAD, and BIM files all in their native format.
Enclosure, Permanent	The condition in which the permanent exterior walls and roofs are in place, insulated and weathertight, and permanent windows and entrances are in place.
Enclosure, Temporary	The condition in which the permanent exterior walls and roofs are in place, insulated and weathertight, and windows and entrances are provided with suitable temporary enclosures.

Estimated Construction Cost	The sum of the Estimated Contract Cost amounts published in the Solicitation, as modified by Addenda, for a phase of the Project.
Estimated Contract Cost	The estimated amount for the Contract published in the Solicitation, including the Base Bid estimate and the estimates of selected Alternates, if any, as modified by Addenda.
Extra Materials	Materials required by the Contract Documents that are not incorporated into the Project but are given to the Owner to be used for future maintenance or repairs.
Fee	See "Contractor's Fee."
Final Inspection	The final review of the Work of the Contractor by the A/E to determine whether issuance of the Certificate of Contract Completion is appropriate.
furnish	Supply and deliver to the Site, or other specified location, ready for installation.
General Conditions	The State's Standard General Conditions in effect as of the date of the Agreement.
General Conditions Costs	General Conditions Costs include only the Contractor's costs to provide the general conditions Work including without limitation the costs of all of the following Site-related items: scheduling and coordinating the Work, telephone, telephone charges, facsimile, telegrams, postage, photos, photocopying, hand tools, simple scaffolds (one level high), tool breakage, tool repairs, tool replacement, tool blades, tool bits, and pre-approved travel, lodging, and parking costs. General Conditions Costs also include (1) Bond premiums and (2) premiums for builder's risk insurance if the Contractor purchases the builder's risk policy for the Project.
Hazardous Materials	Any material, substance, pollutant, or contaminant that is defined, regulated, referenced, or classified in the Comprehensive Environmental Response, Compensation and Liability Act, Federal Water Pollution Control Act, the Resource Conservation and Recovery Act, Clean Air Act, Hazardous Materials Transportation Uniform Safety Act, Toxic Substances Control Act, or any other Applicable Law relating to any hazardous, toxic, or dangerous waste, substance, or material. Any substance or material that, after release into the environment or upon exposure, ingestion, inhalation, or assimilation, either directly from the environment or directly by ingestion through food chains, will, or may reasonably be anticipated to, cause death, disease, behavior abnormalities, cancer or genetic abnormalities and specifically includes but is not limited to asbestos, polychlorinated biphenyls ("PCBs"), radioactive materials, including radon and naturally occurring radio nuclides, natural gas, natural gas liquids, liquefied natural gas, synthetic gas, oil, petroleum and petroleum-based derivatives and urea formaldehyde.
Indemnified Parties	The State, Contracting Authority, Owner, A/E, other Separate Consultants, and their respective officials, officers, consultants, agents, representatives, and employees, in both individual and official capacities.
install	Put into use or place in final position, complete and ready for intended service or use.
Institutional Designee	The party identified in the Agreement empowered with a level of authority similar to the Executive Director of the Commission, which may be the university architect or engineer, director of capital facilities, or an institution vice president.
Institution of Higher Education	Any state of Ohio university or college, community college, state of Ohio community college, technical college, university branch, community college district, technical college district, university branch district, and the applicable board of trustees or, in the case of a university branch district, any other managing authority.
Liquidated Damages	A sum established in the Contract Documents, pursuant to the statutory delay forfeiture authorized under ORC Section 153.19, to be paid to the Owner due to the Contractor's failure to complete the Work within the Contract Time for achievement of Substantial Completion, or any applicable portion of the Work on or prior to any Milestone date stated on the Agreement.

Material Supplier	A Person under a contract with the Contractor to furnish materials or supplies in furtherance of the Work, including all such Persons in any tier. Material Supplier does not include any Separate Contractor unless expressly assigned in writing to the Contractor by the Owner and accepted by the Contractor.
mediation	A voluntary process in which a neutral third party meets with the parties who have a disagreement or dispute and attempts to facilitate a mutually satisfactory resolution.
Milestone	A principal event specified in the Contract relating to a completion date or time.
Modification	A (1) written amendment to the Contract signed by both parties, (2) Change Order, (3) Change Directive, or (4) an order for a minor change in the Work.
negotiation	A form of Alternative Dispute Resolution in which all parties involved are represented by those invested with the authority to agree to a determination of an adjustment in the Contract Sum, Contract Times, or both.
Neutral Facilitator	A nonpartisan third-party without decision-making authority who is engaged to assist the Project's key stakeholders in developing cooperative relationships, achieving project objectives, avoiding or minimizing disputes, and nurturing a more-collaborative ethic characterized by trust, cooperation, and teamwork.
Notice of Commencement	A notice prepared by the Contracting Authority identifying the Project, the Contractors, the Surety for each Contractor, and the name of the Contracting Authority's representative upon whom a claim affidavit may be served.
Notice of Intent to Award	A written notice provided by the Contracting Authority to the apparent successful Bidder stating that upon satisfactory compliance with all conditions precedent for execution of a Contract within the time specified, the Contracting Authority intends to execute a Contract with the Bidder.
Notice to Proceed	A written notice provided by the Contracting Authority authorizing the Contractor to proceed with the Work and establishing the dates for commencement and completion of the Work.
OAC	Ohio Administrative Code
Ohio Facilities Construction Commission	The authorized contracting agent for public improvement projects in accordance with ORC Chapters 123 and 153, acting by and through its Executive Director.
ORC	Ohio Revised Code
Owner	The state of Ohio agency, Institution of Higher Education or division thereof, School District Board, or other instrumentality for whom the Project is being constructed.
Owner's Project Requirements	A written document that details the functional requirements of the Project and the expectations of how it will be used and operated. These requirements include project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
Partial Occupancy	The condition that occurs when the Owner occupies or uses a portion of the Project prior to Contract Completion, partial occupancy is approved by authorities with jurisdiction over the Project and the insurer(s) providing the builders risk insurance, and items of Work cannot be completed until a subsequent date.
partnering	A voluntary dispute prevention process involving team building activities to help define common goals, improve communication, and foster a problem-solving attitude among a group of contracting parties that must work together throughout Contract performance to be less adversarial and more cooperative.
Payment Request	See "Contractor Payment Request."
Person	An individual, corporation, business trust, estate, partnership, association, or other public or private entity.

Phase	A separation in the Work of the Project by sequence or time intervals, which may include separate contractors for each Phase.
Plan Holder	A prospective Bidder that received a set of Contract Documents prior to the bid opening.
Product Data	Manufacturer's standard illustrations, schedules, diagrams, performance charts, instructions, and brochures that illustrate physical appearance, size, and other characteristics of materials and equipment.
Project	The public improvement, of which the Work performed under the Contract Documents may be the whole or a part.
Project Manager	A permanent employee of the Contracting Authority assigned to the Project and authorized to perform specific responsibilities.
Project Manual	That part of Construction Documents which consists of bound volume(s) of primarily written material which generally contain Division 00 - "Procurement and Contracting Requirements," and Divisions 01 through 49 - "Specifications," and other documents pertaining to the Project.
Proposal	The offer of a Contractor to perform the Work set forth in a Proposal Request.
Proposal Request	A document issued after execution of the Contract requesting a Proposal from the Contractor(s), which may initiate a Change Order to modify the Contract.
provide	Furnish and install, complete and ready for intended use.
Punch List	A document listing items of Work requiring correction or completion by the Contractor as a condition precedent to Contract Completion.
Punch List Milestone	The date 30 days after the achievement of Substantial Completion of all or a portion of the Work.
Record Documents	Electronic files and printed documents of all nature prepared by the A/E, which incorporate the information shown on the Contractor's As-Built Documents. They consist of the "Record Drawings" and "Record Project Manual," Certificate of Substantial Completion, Certificate of Contract Completion (as complete), Contractor's Warranty, Manufacturers' Warranties, certificate(s) of occupancy, approved shop drawings and other action submittals, responses to Requests for Information, Addenda, Modifications, Balancing Reports, and the final version of the approved Construction Progress Schedule.
Record Drawings	The Drawings, which have been revised by the A/E to show the changes made during the construction process, conformed to represent the Work as executed by the Contractor.
Record Model	The Building Information Model, which has been revised by the A/E to show the changes made during the construction process, conformed to represent the Work as executed by the Contractor.
Record Project Manual	The Project Manual of the Contract Documents, which has been revised by the A/E to show the changes made during the construction process, based on the As-Built Project Manual furnished by the Contractor.
Request for Change Order	A written notice from the Contractor accompanied by a Proposal for a change in the Work.
Request for Information	A written request to the A/E seeking an interpretation or clarification of the Contract Documents.
RFI	See "Request for Information."
Samples	Physical examples, color selection items, field samples, and mock-ups furnished by the Contractor to illustrate functional and aesthetic characteristics of products, materials, equipment, or workmanship and establish criteria by which the Work shall be judged.

Schedule of Values	A full, accurate, and detailed statement furnished by the Contractor reflecting a defined breakdown of the Contract Sum.
School District	A local, exempted village, or city school district as defined in ORC Chapter 3311, or a joint vocational school established pursuant to ORC Section 3311.18, performing essential governmental functions of state government pursuant to ORC Sections 3318.01 to 3318.20.
School District Board	The board of education of a School District.
Separate Consultant	A Person engaged by the Owner or Contracting Authority to provide Project-related professional services other than the services under this Contract. The term includes the Separate Consultant's authorized representatives, successors, assigns, and subconsultants regardless of tier.
Separate Contract	The contract between the Owner or Contracting Authority and a Separate Consultant or a Separate Contractor.
Separate Contractor	A Person under contract with the Owner or Contracting Authority to provide Project-related work other than the Work under this Contract. The term includes the Separate Contractor's authorized representatives, successors, assigns, and subcontractors regardless of tier.
Shop Drawings	Drawings, diagrams, illustrations, and schedules specifically prepared for the Project provided by the Contractor or a Subcontractor to illustrate some portion of the Work. Shop Drawings are not Contract Documents. Shop Drawings on equipment shall include a written statement from the manufacturer of the equipment certifying the equipment is in compliance with the Contract Documents.
Site	The location designated for the Project.
Specifications	Those portions of the Contract Documents consisting of detailed written administrative, procedural, and technical requirements, included in Divisions 01 through 49, for the construction of the Work, whether physically on the Drawings or bound in separate volumes, including identification of acceptable materials, methods, equipment, quality, and workmanship.
Stage	A distinct period in the life cycle of a facility from concept through construction, to use and deconstruction or demolition. Typical Stages include Program Verification, Schematic Design, Design Development, Construction Documents, Bidding and Award stages; and the Construction Stage, which includes Construction and Closeout activities.
Standard Requirements	The brief name of the "State of Ohio Standard Requirements for Public Facility Construction," including but not limited to General Conditions, and other Division 00 Documents and Division 01 Sections; in effect as of date of the Agreement.
State	The government of Ohio, including any organized body, office, or agency established by the laws of this state for the exercise of any function of state government, or any state institution of higher education as defined in ORC Section 3345.011.
Subcontract	Any contract or agreement between the Contractor and a Subcontractor for performance of a portion of the Work.
Subcontract Form	The State of Ohio Subcontract Form prescribed by OAC Section 153:1-3-02 and required for use with the General Contracting method of project delivery.
Subcontractor	A Person who undertakes to perform any part of the Work on the Project under a contract with a Contractor or with any Person other than the State, including all such Persons in any tier. The term "Subcontractor" includes Material Suppliers, but does not include any Separate Contractor unless expressly assigned in writing to the Contractor by the Owner and accepted by the Contractor.

Substantial Completion	The stage in the progress of the Work when the Work (or designated portion of the Work for which the Contracting Authority and Owner have agreed to take Partial Occupancy) is sufficiently complete in accordance with the Contract that the Owner can utilize the Work for its intended use, as determined by the A/E. The issuance of a certificate of occupancy or partial certificate of occupancy (if applicable) is a condition precedent to the achievement of Substantial Completion.
Substantially Complete	See "Substantial Completion."
Substitution	An article, device, material, equipment, form of construction, or other item, proposed by a prospective Bidder prior to the bid opening and approved by the A/E by Addendum, for incorporation or use in the Work as being functionally and qualitatively equivalent to essential attributes of a Basis of Design or Acceptable Component specified in the proposed Contract Documents.
Supplementary Conditions	Amendments to the General Conditions, issued as a separate document, which describe conditions of the Contract unique to a particular Owner or Project, which may include provisions regarding the assignment of responsibility for refuse removal, safety and security precautions and programs, temporary Project facilities and utilities, weather and fire protection, scaffolding and equipment, materials and services to be used commonly by the Contractor and Subcontractors and requiring the Contractor to provide assistance in the utilization of any applicable equipment system, preparation of operation and maintenance manuals, and training of Owner personnel for operation and maintenance of the Project. The General Conditions shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Conditions prepared by the Contracting Authority and approved by the Commission.
Supplementary Instructions	Amendments to the Instructions to Bidders, issued as a separate document, which describe instructions unique to a particular Owner or Project. The Instructions to Bidders shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Instructions prepared by the Contracting Authority and approved by the Commission.
Surety	A Person providing a Bid Guaranty or a Bond to a Bidder or a Contractor, as applicable, to indemnify the State against all direct and consequential damages suffered by failure of the Bidder to execute the Contract, or of the Contractor to perform the Contract and to pay all lawful claims of Subcontractors, Material Suppliers and laborers, as applicable.
Systems Manual	A system focused composite document that includes the operation manual, maintenance manual, and additional information of use to the Owner after they begin using the facility.
Unit Price	The cost of providing a unit of Work including labor, materials, services, and associated expenses. Unit Prices do not include the Contractor's Fee on account of the associated Unit Price Work.
Work	The labor, materials, equipment, and services, individually or collectively which are required by the Contract Documents, to be performed or provided by the Contractor for the Project. The furnishing of all material, labor, detailing, layout, supplies, plants, tools, scaffolding, transportation, temporary construction, superintendence, demolition, and all other services, facilities and items reasonably necessary for the full and proper performance and completion of the requirements of the Project as set forth in the Contract Documents, and items reasonably inferable therefrom and consistent therewith for the proper execution and completion of the construction and other services required by the Contract Documents, whether provided or to be provided by the Contractor or a Subcontractor, or any other entity for whom the Contractor is responsible, and whether or not performed or located on or off of the Site.

END OF DOCUMENT

Document 00 72 13 - General Conditions (General Contracting Project)

State of Ohio Standard Requirements for Public Facility Construction

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ARTICLE 1 - CONTRACTOR'S RESPONSIBILITIES

1.1 Nondiscrimination

1.1.1 The Contractor shall comply with Applicable Law regarding equal employment opportunity, including ORC Section 153.59 and all Executive Orders issued by the Governor of the state of Ohio.

1.1.1.1 As required under ORC Section 153.59, the Contractor agrees to both of the following:

- .1** "in the hiring of employees for the performance of work under the contract or any subcontract, no contractor, subcontractor, or any person acting on a contractor's or subcontractor's behalf, by reason of race, creed, sex, disability or military status as defined in section 4112.01 of the Revised Code, or color, shall discriminate against any citizen of the state in the employment of labor or workers who is qualified and available to perform the work to which the employment relates;" and
- .2** "no contractor, subcontractor, or any person on a contractor's or subcontractor's behalf, in any manner, shall discriminate against or intimidate any employee hired for the performance of work under the contract on account of race, creed, sex, disability or military status as defined in section 4112.01 of the Revised Code, or color."

1.1.1.2 The Contractor shall cooperate fully with the State's Equal Opportunity Coordinator ("EOC"), with any other official or agency of the state or federal government that seeks to eliminate unlawful employment discrimination, and with all other state and federal efforts to assure equal employment practices under the Contract.

1.1.1.3 In the event the Contractor fails to comply with these nondiscrimination clauses, the Contracting Authority shall deduct from the amount payable to the Contractor a forfeiture of the statutory penalty pursuant to ORC 153.60 for each person who is discriminated against or intimidated in violation of this **Section 1.1.1**.

1.1.1.4 The Contract may be terminated or suspended in whole or in part by the Contracting Authority and all money to become due hereunder may be forfeited in the event of a subsequent violation of this **Section 1.1.1**.

1.1.2 Hiring Under State Public Improvement Contracts.

1.1.2.1 Any provision of a hiring hall contract or agreement which obligates the Contractor to hire, if available, only employees referred to the Contractor by a labor organization shall be void as against public policy and unenforceable with respect to employment under any public improvement contract unless at the date of execution of the hiring hall contract or agreement, or within 30 days thereafter, the labor organization has procedures in effect for referring qualified employees for hire without regard to race, color, religion, national origin, military status as defined in ORC Section 4112.01, or ancestry and unless the labor organization includes in its apprentice and

journeyman's membership, or otherwise has available for job referral without discrimination, qualified employees, both whites and non-whites (including African-Americans).

1.1.3 Affirmative Action.

1.1.3.1 The Contractor and Subcontractors shall comply with the State's Equal Employment Opportunity requirements described under OAC Sections 123:2-3 through 123:2-9 that include, without limitation, the requirements described under this **Section 1.1.3**.

1.1.3.2 The Contractor shall demonstrate its good-faith efforts to comply with the utilization goals currently established for minority and women employees and submit documentation to the EOC.

1.1.3.3 By the tenth day of each month, the Contractor and Subcontractors shall submit to the EOC via the internet a completed Ohio Construction Contract Information Report - Input Form 29 (I-29) for the preceding month. The form shall be submitted through the Ohio Business Gateway: <http://business.ohio.gov/efiling/>.

1.2 Prevailing Wages

1.2.1 The Contractor shall comply with the prevailing wage requirements described under ORC Chapter 4115 that include, without limitation, the requirements described under this **Section 1.2**.

1.2.2 If the Project is subject to payment of prevailing wage rates, the Contractor shall:

1.2.2.1 pay to laborers and mechanics performing Work on the Project the prevailing wage rates of the Project locality, as determined by the Ohio Department of Commerce, Wage and Hour Bureau;

1.2.2.2 post in a prominent place readily accessible by all workers on the Site, a legible listing of the current classifications of laborers, workers, and mechanics employed under this Contract;

1.2.2.3 ensure that the rates posted are current and remain posted in legible condition during the period of the Contract; and

1.2.2.4 not be entitled to an increase in the Contract Sum on account of an increase in prevailing wage rates, except as otherwise provided by Applicable Law.

1.2.3 The Contractor may access the Ohio Department of Commerce, Wage & Hour Bureau at its website, <http://198.234.41.198/w3/webwh.nsf/pages/PrevailingWageBid>, to obtain the current wage rates.

1.3 Royalties and Patents

1.3.1 The Contractor shall pay all royalties and license fees and assume all costs incident to the use, in the performance of the Work or the incorporation in the Work, of any invention, design, process, product, or device that is the subject of patent rights or copyrights held by others.

1.3.2 If the Contractor has reason to believe that use of the specified item is subject to patent or copyright protection, the Contractor shall immediately notify the Contracting Authority.

1.4 Assignment of Antitrust Claims

1.4.1 By signing the Agreement, the Contractor assigns, conveys and transfers to the Contracting Authority any right, title, and interest to any claims or causes of action it may have or acquire under state or federal antitrust laws relating to any goods, products, or services purchased, procured, or rendered to the State pursuant to the Contract.

1.5 Use of Domestic Steel

1.5.1 The Contractor is required by law to supply domestically produced steel products used for load bearing structural purposes on all projects funded in whole or in part with State funds.

1.5.2 The Contractor and Subcontractors shall comply with ORC Section 153.011 regarding the use of domestically produced steel products, and furnish the certifications required by **Section 6.19.8**. Copies of ORC Section 153.011 may be obtained from the Ohio Facilities Construction Commission or downloaded at <http://codes.ohio.gov/orc/153.011v1>.

1.6 Drug Free Safety Program Participation

1.6.1 Throughout the performance of the Work, the Contractor shall be enrolled in and remain in good standing in the Ohio Bureau of Workers' Compensation ("OBWC") Drug-Free Safety Program ("DFSP") or a comparable program approved by the OBWC that meets the requirements specified in ORC Section 153.03 ("OBWC-approved DFSP").

1.6.2 As required under ORC Section 153.03(E):

1.6.2.1 “Each contractor shall require all subcontractors with whom the contractor is in contract for the public improvement to be enrolled in and be in good standing in the Bureau of Workers’ Compensation’s Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to a subcontractor providing labor at the project site of the public improvement.”

1.6.2.2 “Each subcontractor shall require all lower-tier subcontractors with whom the subcontractor is in contract for the public improvement to be enrolled in and be in good standing in the Bureau of Workers’ Compensation’s Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to a lower-tier subcontractor providing labor at the project site of the public improvement.”

1.6.2.3 “Failure of a contractor to require a subcontractor to be enrolled in and be in good standing in the Bureau of Workers’ Compensation’s Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to the time that the subcontractor provides labor at the project site will result in the contractor being found in breach of the contract and that breach shall be used in the responsibility analysis of that contractor or the subcontractor who was not enrolled in a program for future contracts with the State for five years after the date of the breach.”

1.6.2.4 “Failure of a subcontractor to require a lower-tier subcontractor to be enrolled in and be in good standing in the Bureau of Workers’ Compensation’s Drug-Free Workplace Program or a comparable program approved by the Bureau that meets the requirements specified in section 153.03 of the Revised Code prior to the time that the lower-tier subcontractor provides labor at the project site will result in the subcontractor being found in breach of the contract and that breach shall be used in the responsibility analysis of that subcontractor or the lower-tier subcontractor who was not enrolled in a program for future contracts with the State for five years after the date of the breach.”

1.6.3 Prior to authorizing a Subcontractor to commence Work on the Site, the Contractor shall obtain the Contracting Authority’s approval, and shall also submit to the A/E written confirmation of the Subcontractor’s enrollment on the **Subcontractor and Material Supplier Declaration** form.

1.6.4 In addition to OBWC-approved DFSP Basic requirements, the Contractor, each Subcontractor, and each Separate Contractor that provides labor on the Site shall participate in a pool that performs random drug testing of at least five percent of its employees who perform labor on the Site. The random drug testing percentage shall also include the on-site supervisors of the Contractor, Subcontractors, and Separate Contractors. Basic random drug testing shall otherwise comply with the same testing guidelines and criteria as required for OBWC-approved advanced testing. The Contractor and Subcontractor shall provide evidence of required testing to the Contracting Authority upon request.

1.7 Use of the State’s Web-based Project Management Software

1.7.1 If the Contracting Authority decides, in its sole discretion, to utilize the State’s web-based project management software for the Project, the Contractor shall use such software for all compatible services required under this Contract.

1.7.2 All costs for the Contractor’s use of the State’s web-based project management software for the Project shall be included in the Contract Sum. If the Contractor is unfamiliar with the proper use of such software, the Contractor shall provide its employees for training without additional compensation.

1.8 EDGE Participation and Reporting

1.8.1 The Contractor shall participate in the “Encouraging Diversity, Growth and Equity” (“EDGE”) Program by subcontracting with, and using one or more, businesses certified as an EDGE Business Enterprise (“EDGE-certified Business”) by the EOC.

1.8.1.1 If the Contractor is an EDGE-certified Business, the Contractor may include its own compensation under this Contract in the reporting.

1.8.1.2 The amount of EDGE participation cannot exceed 100 percent of the Contract Sum.

1.8.1.3 The Contractor shall include in the reporting only those expenditures to EDGE-certified Businesses that perform a commercially useful function as described in OAC Section 123:2-16-15.

1.8.2 The Contractor shall provide an EDGE Participation Report with each Contractor Payment Request.

1.8.2.1 The Contractor shall provide status reports, produced by the Contractor and each applicable EDGE-certified Business for the Contract, indicating:

- .1 the name of each EDGE-certified Business;
- .2 the federal tax identification number of each EDGE-certified Business;
- .3 the date of the EDGE-certified Business contract, Subcontract, or purchase order;
- .4 the projected and actual start and end dates of the EDGE-certified Business contract, Subcontract, or purchase order;
- .5 the original amount of the EDGE-certified Business contract, Subcontract, or purchase order with the Contractor;
- .6 the current amount of the EDGE-certified Business contract, Subcontract, or purchase order;
- .7 the amount invoiced to date;
- .8 the amount paid to date;
- .9 the status of the EDGE-certified Business contract, Subcontract, or purchase order (active, complete, or void); and
- .10 a statement describing any substantive product or performance deficiencies.

1.8.2.2 The Contractor shall provide reports for each EDGE-certified Business; however, the reports may be consolidated and submitted as one document.

1.8.3 The Contractor shall provide an EDGE Participation Final Report simultaneously with its final Contractor Payment Request.

1.8.3.1 The Contractor and each EDGE-certified Business shall provide in the report certification that the submitted document is a true and accurate accounting of the original contract amount paid to and, received by each EDGE-certified Business.

1.8.4 The Contractor shall provide the EDGE Participation Reports in detail and form acceptable to the Contracting Authority.

1.8.4.1 Failure to timely submit EDGE Participation Reports may result in withholding payment in accordance with **Section 9.8**.

1.8.5 The Contractor shall cooperate fully with requests for additional EDGE information and documentation from the EOC or Contracting Authority.

1.9 Owner Work Rules

1.9.1 The Contractor shall consult with the Owner to obtain full knowledge of the Owner's rules, regulations, or requirements affecting the Project.

1.10 Emergency

1.10.1 In the event of an emergency affecting the safety of the Project, other property, or individuals, the Contractor, without special instruction or authorization, shall act to prevent the threatened damage, injury, or loss.

1.10.2 If the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of its actions in response to an emergency, the Contractor may request a Modification by giving written notice under **Section 7.3.2**.

1.11 Contractor's Standard of Care

1.11.1 The Contractor shall perform the Work in a workmanlike manner, consistent with the standards of skill and care exercised by entities licensed to perform (where required under Applicable Law) and regularly performing comparable work in the same or similar locality under the same or similar circumstances.

1.12 Limit of Contractor's Responsibility

1.12.1 The Contractor is not responsible for the A/E's negligence or the A/E's failure to properly perform the A/E's contract.

1.13 Sustainability Requirements

1.13.1 This Project shall be designed and constructed in accordance with the requirements of Am. Sub. H.B. 251 of the 126th General Assembly and the resulting rules, policies, and procedures adopted by the Ohio Facilities Construction

Commission establishing Sustainability Requirements for Capital Improvements Projects, including but not limited to the applicable provisions of OAC 3318-3.

1.13.2 If the Project is designed and constructed under the Leadership in Energy and Environmental Design (“LEED”) Rating System developed by the U.S. Green Building Council or another rigorous rating system used to facilitate achievement of sustainability goals for the Project, the Contractor shall provide submittals certifying achievement of sustainable design rating system criteria for verification by the Green Building Certification Institute or other third party in accordance with the Contract Documents.

ARTICLE 2 - STATE’S RIGHTS AND RESPONSIBILITIES

2.1 Contracting Authority

2.1.1 The Contracting Authority shall designate a Project Manager for the Project. The Project Manager is authorized to act on behalf of the Contracting Authority to perform specific responsibilities under the Contract.

2.1.2 The Contracting Authority shall furnish information and services required of it in a timely manner.

2.1.3 The Contracting Authority shall have access to the Work at all times, whenever the Project is in preparation or progress.

2.1.4 The Ohio Facilities Construction Commission requires use of its forms where indicated in the Contract Documents. The party responsible for initiating forms shall utilize the latest edition obtained from the Commission’s website: <http://ofcc.ohio.gov>. The Commission may make modifications to its forms at any time.

2.1.4.1 The Contractor shall not modify any form provided by the Commission or Contracting Authority.

2.1.4.2 If the Project is administered using the State’s web-based project management software, the Contractor shall utilize the web-based forms and reports within the applicable business process. The State’s web-based project management software is sponsored by the Commission, and such web-based forms and reports are acceptable to the Commission in lieu of its paper forms.

2.1.5 The Contracting Authority is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor’s failure to carry out the Work in conformity with the Contract Documents.

2.2 Owner

2.2.1 The Owner shall designate a representative authorized to act on behalf of the Owner during the Project.

2.2.2 The Owner shall furnish information and services required of it in a timely manner.

2.2.3 The Owner shall have access to the Work at all times whenever the Project is in preparation or progress.

2.2.4 Upon issuance of the Notice to Proceed, the Owner shall provide the Site to the Contractor in a condition to permit the Contractor to perform the Work.

2.2.5 The Owner may request a change in the Work if the A/E recommends and the Contracting Authority approves the change.

2.2.6 The Owner shall communicate with the Contractor through the Contracting Authority.

2.2.7 The Owner is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor’s failure to carry out the Work in conformity with the Contract Documents.

2.3 Approval of Owner, Contracting Authority, and State

2.3.1 The Owner, Contracting Authority, or State’s review and approval of the Work and any information the Contractor submits to them is for the sole purpose of determining whether the Work and information are generally consistent with the Contract’s intent, and will not relieve the Contractor of its sole responsibility for the performance, preparation, completeness, and accuracy of the Work and information.

2.4 Neutral Facilitation

2.4.1 The Contracting Authority or Owner may engage a Neutral Facilitator for the purposes of (1) building cooperative relationships among the Project participants to achieve discrete objectives; (2) encouraging educated, productive, and

expedited attempts to avoid, minimize, and resolve disputes; and **(3)** maximizing the effectiveness of each participant's resources.

2.4.1.1 For example, a Neutral Facilitator may facilitate the organizational meeting, partnering session(s), and efforts to resolve disputes throughout the Project.

2.4.2 The Contracting Authority, Owner, and Contractor are entitled to interact with the Neutral Facilitator with the full expectation that **(1)** they may act, speak, and disclose information with complete candor and **(2)** all communication, whether oral or written, made in the course of facilitated sessions is confidential.

2.4.3 At any hearing or proceeding regarding any dispute arising out of or related to the Project **(1)** the Neutral Facilitator will not be competent to testify and shall not be called as a witness and **(2)** the Neutral Facilitator's testimony and work product will not be admissible.

2.4.4 The Neutral Facilitator will not **(1)** perform any services with respect to or bear any responsibility for any legal services, design-professional services, construction, or construction management associated with the Project or **(2)** have any liability whatsoever for any claims related to any legal services, design-professional services, construction, or construction management associated with the Project, including without limitation, claims for legal or design-professional errors or omissions, delays, cost overruns, faulty construction, or increased costs.

2.4.5 The Neutral Facilitator's participation in the Project will not relieve the Contracting Authority, Owner, and Contractor of any of their respective rights or obligations under the Contract.

2.5 Contractor Performance Evaluation

2.5.1 The Contracting Authority may evaluate the Contractor's performance during the progress of the Work, at completion of a phase of the Project, completion of the Project, or any of the foregoing. The Contracting Authority shall retain the evaluation(s).

2.5.1.1 The Contractor may request a copy of the completed evaluation(s). If the Contractor wishes to comment or take exception to any rating or remark, the Contractor must send a response in writing to the Contracting Authority within 30 days of receiving the evaluation(s).

2.5.1.2 The Contracting Authority may use the evaluation(s) in determining the responsibility of the Contractor for award of future contracts.

2.5.1.3 The Contracting Authority may request information from the Contractor for use in evaluating the A/E's performance. If information is requested, the Contractor must comply in a timely and responsive manner.

2.5.1.4 If a breach of the Contract is committed by the Contractor or is attributable to a Subcontractor, that breach will be used in the responsibility analysis of the Contractor and Subcontractor (where applicable) for future contracts with the State or subcontracts on State projects for five years after the date of the breach.

ARTICLE 3 - A/E'S RESPONSIBILITIES

3.1 The A/E's Contract Administration Duties

3.1.1 The A/E shall administer the Contract as provided in the Contract Documents and Architect/Engineer Agreement, including, but not limited to, performance of the functions described as follows:

3.1.1.1 The A/E shall attend and conduct progress meetings. The A/E shall prepare an agenda and produce a written report of each progress meeting, and distribute the report to the Contracting Authority, Owner, and Contractor within three business days after the meeting. The A/E shall not delegate the duty to prepare the agenda and written reports of any progress meeting.

3.1.1.2 The A/E may authorize minor changes or alterations in the Work that are consistent with the intent of the Contract Documents and do not involve adjustment of the Contract Sum or Contract Times, or both. The A/E has no authority to authorize the Contractor to perform additional or extra Work for which the Contractor may seek adjustment of the Contract Sum or Contract Times, or both.

3.1.1.3 The A/E shall review and recommend, certify, or approve applicable forms required under the Contract Documents.

3.1.1.4 The A/E shall render decisions in connection with the Contractor's responsibilities under the Contract Documents, and submit recommendations to the Contracting Authority for enforcement of the Contract as necessary.

3.1.2 The A/E is the initial interpreter of all requirements of the Contract Documents. All decisions of the A/E are subject to final determination by the Contracting Authority.

3.2 Site Visits and Observation

3.2.1 The A/E shall notify, advise, and consult with the Contracting Authority and Owner and protect the State against Defective Work throughout completion of the Project, which includes the Correction Period.

3.2.1.1 The A/E shall designate a field representative, subject to the Contracting Authority's approval, to attend to the Project, to observe and check the progress and quality of the Work, and to take action as necessary or appropriate to achieve conformity with the Contract Documents.

3.2.1.2 The A/E shall have its consultants attend to the Project at intervals required by its agreement or the Contracting Authority.

3.2.2 The A/E is authorized to disapprove or reject Defective Work. The A/E shall immediately notify the Contracting Authority any time the A/E disapproves or rejects an item of Work.

3.2.3 The A/E is not responsible for construction means, methods, manners, techniques, sequences, procedures, or for safety precautions and programs in connection with the Work, or for the Contractor's failure to carry out the Work in conformity with the Contract Documents.

3.3 Testing and Inspection Services

3.3.1 Unless otherwise specified in the Contract Documents, the A/E shall apply for, secure, and pay for the costs of structural testing and special inspections under Chapter 17 of the Ohio Building Code; testing including geotechnical analysis, environmental testing and analysis, concrete, masonry, structural steel, reinforcing steel, welding, bolts, steel connections, HVAC systems and controls, plumbing and piping, air and water balancing and testing, or other testing; or approval required by Applicable Law.

3.4 Approval of A/E

3.4.1 The A/E's review and approval of the Work and any information the Contractor submits to the A/E is for the sole purpose of determining whether the Work and information are generally consistent with the Contract's intent, and will not relieve the Contractor of its sole responsibility for the performance, preparation, completeness, and accuracy of the Work and information.

3.5 Limitation of A/E's Authority

3.5.1 Under no circumstances is the A/E authorized to:

3.5.1.1 bind the Owner or Contracting Authority to any authorizations under, modifications of, or amendments to any contract other than as expressly described under **Section 3.1.1.2**;

3.5.1.2 accept any defective or non-conforming services, Work, or vendor-furnished items;

3.5.1.3 make any settlements on behalf of the Owner or Contracting Authority; or

3.5.1.4 assume any responsibilities of the Contractor or Subcontractors.

ARTICLE 4 - SUBCONTRACTORS

4.1 Evaluation and Approval

4.1.1 Within ten days after the Notice to Proceed, or other period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the A/E a **Subcontractor and Material Supplier Declaration** form through which the Contractor identifies its Subcontractors.

4.1.2 The Contractor's failure to timely submit the information regarding a proposed Subcontractor may result in withholding payment in accordance with **Section 9.8**.

4.1.3 After receiving the **Subcontractor and Material Supplier Declaration** form, the A/E shall verify that it is complete and deliver it to the Contracting Authority and Owner. If the A/E finds the form incomplete, the A/E shall return it to the Contractor and identify the incomplete information.

4.1.4 If the Contracting Authority rejects any proposed Subcontractor, the Contractor shall propose a replacement Subcontractor with no adjustment of the Contract Sum. The proposed replacement Subcontractor will be evaluated as described above.

4.1.5 No less than ten days before Work is to be performed by the Subcontractor, or within a shorter period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the Contracting Authority a complete copy of the executed Subcontract between the Contractor and Subcontractor.

4.2 Form of Subcontract

4.2.1 All Subcontracts shall be on the **State of Ohio Subcontract Form** prescribed by OAC Section 153:1-03-02.

4.2.2 No less than ten days before Work is to be performed by a Subcontractor, or within a shorter period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the Contracting Authority and A/E a complete copy of the executed Subcontract between the Contractor and Subcontractor. After receiving the Subcontract, the A/E shall verify that it is complete and deliver it to the Contracting Authority. If the A/E finds the Subcontract incomplete, the A/E shall return it to the Contractor and identify the incomplete information.

4.3 Replacement of Subcontractors

4.3.1 The Contractor shall not replace any Subcontractor after execution of the Subcontract without the prior written approval of the Contracting Authority.

4.4 Contractor's Responsibility

4.4.1 The Contractor is fully responsible for all acts and omissions of its Subcontractors and is responsible for scheduling and coordinating the Work of its Subcontractors.

4.4.1.1 The Contractor is fully responsible for any delay, interference, disruption, or hindrance attributable to the Contractor's Subcontractors.

4.4.1.2 The Contractor shall require that each of its Subcontractors have a competent supervisor at the Site whenever the Subcontractor is performing Work.

4.4.1.3 The Contractor shall bind its Subcontractors to the terms of the Contract Documents, so far as applicable to the Work of the Subcontractor.

4.4.1.4 The Contractor shall not agree to any provision, which seeks to bind the State to terms inconsistent with or at variance from the Contract Documents.

4.4.2 The Contractor will not be relieved of its full responsibility for Subcontractors and their performance of the Work by **(1)** the participation of the Owner, Contracting Authority, and A/E in the processes described under this **Article 4** or other related provisions of the Contract Documents or **(2)** the Contracting Authority's rejection of a Subcontractor or failure to reject a Subcontractor under **Section 4.1**.

4.5 Contingent Assignment of Subcontracts

4.5.1 The Contractor hereby assigns its agreement with each Subcontractor to the Contracting Authority provided that the assignment is effective only after termination of the Contract in whole or in part by the Contracting Authority and only for those agreements that the Contracting Authority accepts by notifying the Contractor and applicable Subcontractors in writing. The Contracting Authority may re-assign accepted agreements.

4.5.1.1 If the Contracting Authority terminates the Contract in part, the Contracting Authority may **(1)** take assignment of any entire Subcontract affected by the termination or **(2)** take partial assignment of only the portion of any Subcontract associated with the terminated part of the Contract.

4.6 Prompt Payment

4.6.1 The Contractor shall make payments to Subcontractors in accordance with Applicable Law, including ORC Section 4113.61.

4.6.2 The Contractor may reduce the amount paid to a Subcontractor pursuant to **Section 4.6.1** at a rate equal to the percentage retained from the Contractor and may withhold amounts necessary to **(1)** resolve disputed liens or claims involving the Work of the Subcontractor or **(2)** account for the failure of the Subcontractor to perform its obligations under its agreement with the Contractor.

ARTICLE 5 - PRECONSTRUCTION ACTIVITIES

5.1 Partnering

5.1.1 The formation of a cohesive, mutually beneficial partnering arrangement among the Contractor, Contracting Authority, A/E, and Owner will accomplish the construction of the Project most effectively and efficiently. This arrangement draws on their collective strengths, skills, and knowledge to achieve a Project of the intended quality, within budget, and on schedule. To achieve that objective, participation in a partnering session is required for the following key stakeholders:

5.1.1.1 Contracting Authority: Project Manager

5.1.1.2 Owner: Primary representative

5.1.1.3 A/E: Principal-in-charge, project manager, field representative, major consultants

5.1.1.4 Contractor: Principal-in-charge, project manager, and superintendent

5.1.1.5 Major Subcontractors (e.g., plumbing, HVAC, electrical): Principal-in-charge, project manager or superintendent

5.1.1.6 CxA, if applicable

5.1.2 The purpose of the partnering arrangement is to build cooperative relationships between the Project's key stakeholders, avoid or minimize disputes, and nurture a more collaborative ethic characterized by trust, cooperation and teamwork. This arrangement is intended to produce a voluntary, non-binding, but formally structured agreement among the Project's key stakeholders, leading to an attitude that fosters risk sharing.

5.1.3 To create and implement the partnering arrangement, the Project's key stakeholders shall meet prior to the construction of the Project for developing a partnering agreement. The agreement should be comprehensive and focus on all issues necessary for successful completion of the Project, and shall identify common goals and objectives, develop a problem solution process, an Alternative Dispute Resolution ("ADR") strategy in accordance with **Section 8.13**, and an implementation plan for the partnering arrangement.

5.1.4 Formal contractual relations, responsibilities, and liabilities are not affected by any partnering arrangement. The cost associated with establishing this partnership, including but not limited to engaging the services of a Neutral Facilitator, shall be included in an allowance in the Contractor's bid. The Contractor shall include in its base bid the resources necessary to participate in the partnering session.

5.1.5 Partnering services may extend over the entire period of performance of the Contract and may include intervention or project realignment services to be utilized if serious disputes arise. The Project's key stakeholders should agree, during the initial partnering session, to the types of situations and circumstances in which intervention or realignment services shall be utilized.

5.2 Building and Trade Permits and Licenses

5.2.1 Plan Approval.

5.2.1.1 The A/E shall secure the required structural, plumbing, HVAC, and electrical plan approvals.

5.2.1.2 The Contractor shall schedule and attend all intermediate and final inspections required for any permit applicable to the Work. The Contractor shall schedule the State Fire Marshal or local fire authority for the life safety inspection for occupancy permits. The Contractor shall give the A/E, Contracting Authority, and Owner reasonable notice of the dates and times arranged for inspections.

- .1** The Contractor shall pay for any reinspections required as a result of the Contractor's failure to receive approval of its Work.

5.2.2 Trade Permits and Licenses.

5.2.2.1 The Contractor shall obtain, maintain, and pay for any permit, inspection, or license applicable to the Contractor's particular trade.

5.2.3 Local Permits.

5.2.3.1 The Contractor shall secure and pay the fees for any permits, inspections, licenses, capacity charges, or tap fees required by local authorities having jurisdiction over the Project. The Contractor shall give the A/E, Contracting Authority, and Owner reasonable notice of the date arranged for inspections.

5.2.4 National Pollutant Discharge Elimination System (“NPDES”) Storm Water General Permit.

5.2.4.1 The A/E shall secure the NPDES general permit by submitting a Notice of Intent (“NOI”) application form to the Ohio Environmental Protection Agency at least 45 days prior to the start of construction. The Contractor shall be a “co-permittee” if required under Applicable Law.

5.2.4.2 The A/E shall prepare and certify a storm water pollution prevention plan to provide sedimentation and erosion controls at the Project.

5.2.4.3 The A/E shall prepare and process the required Notice of Termination (“NOT”) prior to Contract Completion.

ARTICLE 6 - CONSTRUCTION AND CLOSEOUT

6.1 Commencement of Work on the Site

6.1.1 Unless the Contracting Authority agrees otherwise in writing, the Construction Stage will commence with the Contracting Authority’s issuance of the Notice to Proceed and will terminate upon Contract Completion.

6.2 Responsibility of the Contractor

6.2.1 The Contractor shall complete portions of the Work in the sequence and time in the Construction Progress Schedule.

6.2.2 The Contractor shall supervise the Work.

6.2.3 The Contractor must perform the Work so as not to interfere with, disturb, hinder, or delay the services of Separate Consultants or the work of Separate Contractors. The Contractor must cooperate and coordinate fully with all Separate Consultants and Separate Contractors and must freely share all of the Contractor’s Project-related information with them to facilitate the timely and proper performance of the Work and of the services and work of the Separate Consultants and Separate Contractors.

6.2.4 The Contractor must afford every Separate Consultant and Separate Contractor proper and safe access to the Site and a reasonable opportunity for the introduction and storage of materials and equipment and the execution of their services and work.

6.2.5 If the Contractor damages the property or work of any Separate Consultant or Separate Contractor, or by failure to perform the Work with due diligence, delays, interferes with, hinders, or disrupts the services of any Separate Consultant or the work of any Separate Contractor who suffers additional expense and damage as a result, the Contractor is responsible for that damage, injury, or expense.

6.2.6 The intent of **Sections 6.2.3 through 6.2.5** is to benefit the Separate Consultants and Separate Contractors, and to demonstrate that the Separate Consultants and Separate Contractors are intended third-party beneficiaries of the Contractor’s obligations under the Contract.

6.2.7 If the proper execution or results of any part of the Work depends upon work performed or services provided by the Owner, a Separate Consultant, or a Separate Contractor, the Contractor must inspect that other work and appropriate instruments of service, and promptly report to the Contracting Authority in writing any defects or deficiencies in that other work or services that render it unavailable or unsuitable for the proper execution and results of the Work. The Contractor’s failure to report before starting the affected part of its Work will constitute an acceptance of the other work and services as fit and proper for integration with the Contractor’s Work except for defects and deficiencies in the other work or services that were not reasonably discoverable at the time of the Contractor’s inspection.

6.2.8 The Contractor shall not delay the Work on account of any claim, dispute, or action between the Contractor and a Separate Consultant or Separate Contractor.

6.2.9 The Contractor shall develop and keep current the Construction Progress Schedule in accordance with **Section 6.5**, and prepare and keep current a schedule of submittals that is coordinated with the Construction Progress Schedule, for the A/E and Contracting Authority’s acceptance.

6.2.10 The Construction Progress Schedule shall not exceed the time limits current under the Contract Documents, shall provide for reasonable, efficient, and economical execution of the Project, and shall relate to the entire Project to the extent required by the Contract Documents.

6.2.11 The Contractor shall use the Construction Progress Schedule to plan, organize, and execute the Project, record and report actual performance and progress, and show how it plans to coordinate and complete all remaining work by Contract Completion.

6.2.12 The Contractor shall monitor the progress of the Work for conformance with the Construction Progress Schedule and shall initiate revisions as required by **Section 6.5.14**.

6.2.13 The Contractor shall establish the Project's regular working hours, subject to approval by the A/E and the Owner.

6.2.14 The Contractor shall coordinate the Work with the activities and responsibilities of the A/E, Owner, and Contracting Authority to complete the Project in accordance with the Contract Documents.

6.2.15 In the event of default of the Contractor, the Contractor shall cooperate with the A/E, Contracting Authority, and Contractor's Surety to achieve the Substantial Completion date and Contract Completion.

6.2.16 The Contractor shall remove all snow and ice as may be required for reasonably safe access to the Project including, but not limited to, building entries, driveways, parking lots, and sidewalks.

6.2.17 The Contractor shall keep a daily log containing a record of weather, number of workers on Site, identification of equipment, Work accomplished, problems encountered, and other similar relevant data.

6.3 Construction Procedures

6.3.1 The Contractor is solely responsible for and has control over all construction means, methods, manners, techniques, sequences, and procedures, for safety precautions and programs in connection with the Work, and for coordinating all portions of the Work.

6.3.1.1 If the Contract Documents give instructions that affect construction means, methods, manners, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety of them and, except as stated below, shall be fully and solely responsible for the jobsite safety of the means, methods, manners, techniques, sequences, or procedures.

6.3.1.2 If the Contractor determines that the means, methods, manners, techniques, sequences, or procedures specified in the Contract Documents may not be safe, the Contractor shall give timely written notice to the A/E, Owner, and Contracting Authority. The Contractor shall not proceed with that portion of the Work without further written instructions from the A/E. Any modification of the Contract shall be in accordance with **Article 7**.

6.3.2 The Contractor shall lay out and coordinate all lines, levels, elevations, and measurements for all of the Work, coordinate and verify existing conditions, and notify the A/E of discrepancies and conflicts before proceeding with installation or excavation.

6.3.3 The Contractor shall perform all cutting, fitting, or patching required for the Work and shall not endanger the Project by cutting, excavating, or otherwise altering the Project, or any part of it.

6.3.3.1 If the Contractor requires sleeves for the Work, the Contractor shall furnish and install the sleeves. The Contractor is responsible for the exact location and size of all holes and openings required to be formed or built for the Work.

6.3.3.2 The Contractor's patching shall match and blend with the existing or adjacent surface(s).

6.3.4 The Contractor shall comply with ORC Sections 3781.25 through 3781.32. In addition, before starting excavation or trenching, the Contractor shall determine the location of any underground utilities and notify any public authority or utility having jurisdiction over the Project and secure any required approval.

6.3.5 The Contractor shall install all Work in accordance with the Contract Documents and any installation recommendations of the manufacturer, including required temperature and humidity limits for installation of the various materials.

6.3.6 The Contractor shall comply with all requirements and conditions of the NPDES general permit, including, but not limited to, implementing and maintaining the sedimentation and erosion control measures specified in the storm water pollution prevention plan prepared by the A/E pursuant to **Section 5.2.4**, which are related to the Work, maintaining records of its construction activities, removing materials no longer required, and taking proper action if there is a reportable quantity spill.

6.3.7 The Contractor shall communicate with the Contracting Authority and Owner through the A/E.

6.4 Construction Supervision

6.4.1 Unless waived by the Contracting Authority in writing, the Contractor shall provide continuous supervision at the Site by a competent superintendent when any Work is being performed, and the Contractor's superintendent shall not be involved with any work other than the Project.

6.4.2 The Contractor's project manager and superintendent shall each have the responsibility and authority to act on behalf of the Contractor. All communications to the Contractor's project manager or superintendent shall be binding as if given directly to the Contractor.

6.4.3 The Contractor shall submit an outline of the qualifications and experience of the Contractor's proposed project manager and proposed superintendent, including references, to the Contracting Authority no less than ten days of the Notice to Proceed. For all Subcontracts in excess of \$200,000, and for all other Subcontracts on request from the Contracting Authority, the Contractor shall submit an outline of the qualifications and experience of the Subcontractor's proposed project manager and proposed superintendent, including references, to the Contracting Authority no less than ten days before the Subcontractor is scheduled to begin Work on the Site.

6.4.3.1 The Contracting Authority may reject the Contractor or Subcontractor's proposed project manager or proposed superintendent. If the Contracting Authority does not notify the Contractor of the rejection within 30 days after receiving the required information, it shall indicate that the Contracting Authority has no objection, but does not affect the Contracting Authority's rights under **Section 6.11.2** or any other provision relative to that project manager or superintendent.

6.4.3.2 If the Contracting Authority rejects the Contractor or Subcontractor's proposed project manager or proposed superintendent, the Contractor shall replace, or cause the Subcontractor to replace the project manager or superintendent (as appropriate) with someone acceptable to the Contracting Authority at no additional cost.

6.4.4 The Contractor and its Subcontractors shall not replace their respective project managers or superintendents without prior written approval of the Contracting Authority.

6.4.4.1 If the Contractor or a Subcontractor proposes to change its project manager or superintendent, the Contractor shall submit written justification to the Contracting Authority, along with the name and qualifications of the proposed replacement.

6.4.4.2 The procedure provided in **Section 6.4.3** shall be conducted to evaluate the Contractor or Subcontractor's (as applicable) proposed replacement project manager or superintendent.

6.5 Construction Progress Schedule

6.5.1 If the Estimated Construction Cost is less than \$500,000, the Contractor may provide a bar chart schedule with a logical sequence of events and sufficient detail to properly anticipate and monitor construction progress. If the Estimated Construction Cost for the Project is \$500,000 or more, the Contractor shall prepare and maintain a resource-loaded Construction Progress Schedule using the critical-path method of scheduling that provides the following information:

6.5.1.1 a graphic presentation of the sequence of the Work for the Project in the media and format required for the Project;

6.5.1.2 identification of each stage of the Work and any Milestone dates;

6.5.1.3 identification of activities and durations for review and approval of Shop Drawings and other action submittals, fabrication and review of mock-up Work, product review and procurement, fabrication, shop inspection, and delivery, including, but not limited to, lead time, coordination drawing delivery, Substantial Completion, Punch List, Punch List Correction, Project close-out requirements, occupancy requirements, and Contract Completion;

6.5.1.4 identification of disruptions and shutdowns due to other operations;

6.5.1.5 identification of the critical path of the Work;

6.5.1.6 identification of the crew size and total resource hours for each activity in the schedule; and

6.5.1.7 the Contractor's signature and date indicating approval.

6.5.2 The Contractor shall develop the Construction Progress Schedule using commercially available, personal computer software acceptable to the Contracting Authority and shall submit all baseline and updated schedules to the A/E in the schedules' native electronic format.

6.5.3 The Construction Progress Schedule shall not exceed the time limits current under the Contract Documents, shall provide for reasonable, efficient, and economical execution of the Project, and shall relate to the entire Project to the extent required by the Contract Documents.

6.5.4 The Contractor shall use the Construction Progress Schedule to plan, organize, and execute the Project, record and report actual performance and progress, and show how it plans to coordinate and complete all remaining Work within applicable Milestones. The Project participants shall use the Construction Progress Schedule as a tool for scheduling and reporting sequenced progress of the Work. The Contractor shall provide a clear graphics legend and other data including, but not limited to, Milestone dates, constraints, and other items required by the Project, A/E, Contracting Authority, and Owner. Each submission shall show the Contracting Authority's Project number and Project name, and provide a signature approval and date line for the Contractor.

6.5.5 The Contractor shall provide in each schedule: Activity identification and description for each activity broken down to a maximum duration that is appropriate for the activity, responsibility of the Contractor, Contractor's resources and crew size for each activity, provide early start, early finish, late start, late finish dates. Each schedule shall show predecessor activities and successor activities for each activity, entry free float, total float, and percentage of completion, and identify the appropriate predecessors and successors for all related activities.

6.5.6 The Construction Progress Schedule shall show all submittal dates, review and approval durations for coordination drawings, Shop Drawings, other action submittals, and mock-up Work.

6.5.7 Within 30 days of the date of the Notice to Proceed, the Contractor shall submit to the A/E a proposed Construction Progress Schedule approved by the Contractor. If the Project is \$4 million total construction cost or more, the Contractor may submit an intermediate Bar Chart Schedule for the first 120 days to the A/E within 30 days of the date of the Notice to Proceed; followed by the complete resource-loaded precedence or arrow diagram schedule within 90 days of the date of the Notice to Proceed.

6.5.7.1 The Contractor shall submit the initial and all updates of the Construction Progress Schedule in graphic and tabular form to the A/E. With each monthly schedule update, the Contractor shall include a list of all changes to the previously approved baseline schedule or monthly updated schedule.

6.5.7.2 After receiving the Construction Progress Schedule, the A/E shall review and submit a copy of the Construction Progress Schedule to the Contracting Authority and Owner for review and acceptance, or reject and return it to the Contractor with recommendations for revisions.

6.5.8 The Construction Progress Schedule shall be managed using early start dates and early finish dates. The Contractor must exhaust existing float before claiming additional time for a Change Order, or show that it is not possible to use float to cover the time requirements of the Change Order.

6.5.9 The Contractor's failure to timely submit and properly maintain an approved Construction Progress Schedule may result in withholding payment in accordance with **Section 9.8**.

6.5.10 For each progress meeting, the Contractor shall provide a two- to six-week look-ahead schedule, as appropriate for the Project.

6.5.11 On a weekly basis, the Contractor shall prepare and submit to the A/E a written report describing:

6.5.11.1 activities begun or finished during the preceding week;

6.5.11.2 activities in progress and expected completion;

6.5.11.3 activities to be started or finished in the upcoming two weeks, including but not limited to, the Contractor's workforce size and total resource hours associated with those activities; and

6.5.11.4 other information requested by the A/E.

6.5.12 The A/E shall attach the above information to the minutes of the weekly progress meetings.

6.5.13 The Contractor shall provide monthly Progress Status Reports to the Contracting Authority, A/E, and Owner, which shall include recommendations for adjusting the Construction Progress Schedule to meet Milestone dates and the Substantial Completion date.

6.5.13.1 If it is apparent to the A/E that the Contractor may be unable to meet critical path activities, Milestone completion dates, or the Substantial Completion date, the A/E shall direct the Contractor to submit within three days a recovery plan to avoid or minimize delay to the Project.

6.5.13.2 A recovery plan shall include, but is not limited to, adjustments to one or more of the following:

- .1** workforce;
- .2** hours per shift;
- .3** shifts per workday;
- .4** workdays per week;

- .5 equipment;
- .6 activity logic.

6.5.13.3 If the A/E approves the recovery plan, the Contractor shall prepare a revised Construction Progress Schedule approved in accordance with **Section 6.5.7**. If the A/E does not approve the recovery plan, the Contractor shall submit within three days an alternate recovery plan to the A/E in writing for review and approval in accordance with **Section 6.5.7**.

6.5.14 The Contractor shall update the Construction Progress Schedule on a monthly basis, or other interval approved by the Contracting Authority, in accordance with **Section 6.5.7**.

6.5.14.1 The updated Construction Progress Schedule approved by the Contractor shall serve as an affirmation that the Contractor can meet the requirements of the updated Construction Progress Schedule.

6.5.14.2 The Contractor shall submit a tabular copy showing all changes to the previously approved schedule including, but not limited to, logic, float, and actual start date of activities. The original or initially approved Construction Progress Schedule and all subsequent Construction Progress Schedules submitted by the Contractor, and accepted by the A/E, shall serve as an affirmation that the Contractor agrees to and can meet the applicable requirements of the updated Construction Progress Schedule.

6.5.14.3 The Contractor's failure to timely submit an approved, updated Construction Progress Schedule may result in withholding payment in accordance with **Section 9.8**.

6.6 Progress Meetings

6.6.1 The A/E shall schedule a weekly progress meeting for the Contractor and other Persons involved in the Project. The purpose of the progress meeting is to review progress on the Project during the previous week, discuss anticipated progress during the following weeks, review critical operations, and discuss critical problems.

6.6.2 The Contractor shall be represented at every progress meeting by a Person authorized with signature authority to make decisions regarding possible modification of the Contract Documents or Construction Progress Schedule.

6.6.2.1 The A/E shall notify the Contractor and other Persons involved in the Project of the time and place of the progress meeting that shall thereafter be the same day and hour of the week for the duration of the Project, unless the A/E notifies the Contractor and other Persons involved in the Project of a different day and hour at least two days in advance.

6.6.2.2 The Contractor shall have any of its Subcontractors attend the progress meeting as determined advisable by the Contractor, or as requested by the A/E.

6.6.3 The A/E shall prepare a written report of each progress meeting and distribute the report to the Contracting Authority, Owner, and Contractor. The A/E shall not delegate the duty to prepare a written report of any progress meeting.

6.6.3.1 If any Person in attendance objects to anything in a report of a progress meeting, the Person shall notify the A/E, Contracting Authority, and any other affected Person in writing explaining the objection within five days.

6.6.3.2 The report of each progress meeting shall reflect any objection made to the report of the previous progress meeting and any response.

6.7 Project Coordination

6.7.1 The Contractor shall prepare drawings ("Coordination Drawings") after the Contractor and appropriate Subcontractors ("Coordination Participants") **(1)** determine the sequence of the Project, **(2)** identify the areas requiring special attention ("Coordination Areas"), and **(3)** determine the need for a coordination drawing for any Coordination Area. The Contractor shall prepare the Coordination Drawings with Computer-Aided Design ("CAD") or Building Information Modeling ("BIM") software acceptable to the Contracting Authority. The Coordination Drawings shall show the sheet metal work with plan and elevation dimensions, which specifically locate all HVAC ductwork, HVAC equipment, and HVAC piping for each Coordination Area based upon the information, discussion, and resulting consensus of the Coordination Participants during the coordination meetings.

6.7.1.1 After the Contractor completes the Coordination Drawings, the Contractor shall forward a copy of the Coordination Drawings to the A/E, Contracting Authority, and Owner.

6.7.1.2 The A/E shall review the Coordination Drawings to determine whether the Coordination Participants achieved the goals listed in **Section 6.7.1**. The A/E shall report any concerns, in writing, to the Coordination Participants within 14 days after receiving the drawings.

6.8 Review of Contract Documents and Field Conditions

6.8.1 Before starting each portion of the Work, the Contractor shall carefully study and compare the various Contract Documents relative to that portion of the Work, 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.

6.8.2 If the Contractor finds any perceived ambiguity, conflict, error, omission, or discrepancy on or between any of the Contract Documents, or between any of the Contract Documents and any Applicable Law, the Contractor, before proceeding with the Work, shall promptly submit a Request for Information ("RFI") to the A/E for an interpretation or clarification.

6.8.2.1 Before submitting any RFI to the A/E, the Contractor shall carefully review the Contract Documents to ensure that the Contract Documents do not answer the RFI.

6.8.2.2 The A/E shall respond to an RFI within three days of receiving the RFI.

6.8.2.3 Any interpretation or clarification of the Contract Documents made by any Person other than the A/E, or in any manner other than writing, shall not be binding and the Contractor shall not rely upon it.

6.8.3 If the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of clarifications or instructions issued by the A/E in response to a RFI, the Contractor may request a Change Order by giving written notice under **Section 7.3.2** within seven days of receiving the A/E's RFI response.

6.8.4 If the Contractor does not notify the A/E per **Section 6.8.3**, the Contractor will have accepted the RFI response without an adjustment to the Contract Sum or Contract Times.

6.9 Protection of the Project

6.9.1 The Contractor shall protect the Work from weather and maintain the Work and all materials, apparatus, and fixtures free from injury or damage until Substantial Completion of the Work.

6.9.1.1 The Contractor shall at all times cover or protect the Work.

6.9.1.2 The Contractor, at its expense, shall remove, and replace with new, any Work damaged as a result of the Contractor's failure to provide coverage or protection.

6.9.1.3 The Contractor, at its expense, shall repair or replace any adjacent property, including, but not limited to, roads, walks, shrubbery, plants, trees, or turf, damaged during performance of the Contract.

6.9.1.4 After the date of Substantial Completion of the Work, the Owner is responsible for protecting and maintaining all materials, apparatus, and fixtures for the occupied portion of the Project free from injury or damage.

6.9.2 The Contractor shall protect the Project and existing or adjacent property from damage at all times and shall erect and maintain necessary barriers, furnish and keep lighted necessary danger signals at night, and take reasonable precautions to prevent injury or damage to individuals or property.

6.9.3 The Contractor shall not load, or permit any part of the Project to be loaded, in any manner that endangers the Project, or any portion thereof. The Contractor shall not subject any part of the Project or existing or adjacent property to stress or pressure that endangers the Project or property.

6.9.4 The Contractor shall provide all temporary bracing, shoring, and other structural support required for safety and proper execution of the Work.

6.9.5 Vibration, Noise, and Dust Control.

6.9.5.1 The Contractor shall provide controls/barriers for vibrations, noise, and dust control in occupied buildings as required by the construction operations.

6.9.5.2 The Contractor will not be permitted to exhaust or release unfiltered air, dust, construction debris, or other undesirable products into the exterior atmosphere or into occupied areas of the building outside the Site. The Project Manager may limit or stop the Work if the Contractor does not maintain proper air-quality standards.

6.9.5.3 In certain occupied buildings, tasks might be of such a nature that noise and vibration cannot be tolerated. In such spaces, Work shall be scheduled for other than normal working hours. The Contractor is cautioned that weekend or overtime work, if required, shall be performed at no additional cost. The Contractor shall obtain the Contracting Authority's written permission before working other than standard hours. Weekend and overtime Work shall be reflected in the Construction Progress Schedule.

6.9.5.4 The Contractor is responsible for vibration control and control of transmission of noise arising from the Work. Principal considerations that shall be given to noise and vibration control are:

- .1** Noise control in compliance with Occupational Safety and Health Administration (“OSHA”) requirements for the health and safety of building occupants; control shall be for all areas of the facility, including equipment rooms, boiler rooms, and fan rooms.
- .2** Vibration control to limit sound produced by construction equipment, and for protection of the equipment existing in a building and the building structure.
- .3** Vibration control to provide for maximum usefulness of the facility by keeping levels of vibration within ranges conducive to study and work or other uses for which the facility is designed.

6.10 Materials and Equipment

6.10.1 The Contractor shall provide new materials and equipment of the quality specified in the Contract Documents.

6.10.2 The Contractor shall bring to or store at the Site only the materials and equipment required in the Work. If possible, materials and equipment should be installed in their final positions when brought to the Site.

6.10.2.1 The Contractor shall properly store and protect all materials and equipment it provides to the Project.

6.10.2.2 The Contractor shall timely remove from the Site any materials or equipment no longer required for the Work.

6.10.3 The Contractor shall not allow materials or equipment to damage the Project or adjacent property, or to endanger any individual at or near the Site.

6.10.4 If the Contractor provides an Acceptable Component, the Contractor shall be solely responsible for the costs of coordination and modification required.

6.10.5 If the Contractor provides approved Substitutions that require changes to the Contract Documents, the Contractor shall be solely responsible for the additional costs incurred as a result, including, but not limited to, changes to the design by the A/E.

6.10.6 The A/E shall consider Requests for Substitutions after the bid opening only when the Contractor can conclusively demonstrate to the A/E the following conditions:

6.10.6.1 the specified Basis of Design Components, Acceptable Components, or previously-approved Substitutions, through no fault of the Contractor or a Subcontractor, are not available; or

6.10.6.2 the specified Basis of Design Components, Acceptable Components, or previously-approved Substitutions will not perform as designed or intended.

6.10.7 The Contractor’s incorporation of unapproved Substitutions in the Work is Defective Work.

6.11 Labor

6.11.1 The Contractor shall maintain a sufficient workforce and enforce good discipline and order among its employees and the employees of its Subcontractors. The Contractor shall not permit employment of individuals not skilled in tasks assigned to them.

6.11.2 The Contractor shall dismiss from the Project any individual employed by the Contractor, or a Subcontractor, who the Contracting Authority finds, in its sole discretion, to be incompetent, guilty of misconduct, or detrimental to the Project.

6.11.3 The Contractor shall employ all legal efforts to minimize the likelihood or effect of any strike, Work stoppage, or other labor disturbance. Informational pickets shall not justify any Work stoppage.

6.12 Safety Precautions

6.12.1 The Contractor shall take reasonable precautions to ensure the safety of individuals on the Project.

6.12.1.1 The Contractor is responsible for designing and implementing its own safety program, including compliance with OSHA regulations. The Contractor’s safety plans, such as fall protection, hazards, communications, competent person, etc., shall meet or exceed the Owner’s safety plan (if any).

6.12.2 The Contractor shall pay any fine or cost incurred because of the Contractor’s violation, or alleged violation, of Applicable Law.

6.12.3 Before starting any Work, the Contractor shall submit to the Contracting Authority a copy of the Contractor's site-specific safety plan and safety manuals.

6.12.4 The Contractor shall not introduce Hazardous Materials to the Project (other than as specified in the Contract Documents or customary construction materials or equipment) or burn any fires on the Site.

6.12.4.1 If the Contractor brings Hazardous Materials to the Project, the Contractor must take reasonable precautions to prevent the Hazardous Materials from causing bodily injury or death, property damage, or environmental damage.

6.12.4.2 The Contractor shall notify the Project Manager 24 hours before the start of non-routine or non-recurring hot-work. Use of sources of fire, flame or sparks and flammable materials shall be kept to an absolute minimum. At the beginning of the Project, the Contractor shall inform the Project Manager of its intent to use blowtorches, welding apparatus or similar exposed flame and sparking devices. The Contractor shall give similar notice in regard to the use of flammable liquids, adhesives, and cleaners.

6.12.4.3 The Contractor shall furnish an appropriate number of fire extinguishers (minimum of one), which shall be within the immediate areas where work is being done at all times. The extinguisher(s) shall be adequate and suitable for the class of fire likely to be caused by the Contractor's operations.

6.12.5 Work Stoppage Due to Hazardous Materials.

6.12.5.1 If the Contractor encounters material the Contractor reasonably believes to be or contain, a Hazardous Material that has not been rendered harmless, the Contractor shall immediately stop Work in the affected area and verbally report the condition to the Contracting Authority and A/E, and within one business day deliver written notice of the condition to the Contracting Authority and A/E.

6.12.5.2 The Contracting Authority will promptly determine the necessity of the Owner retaining a qualified environmental consultant to evaluate the suspected Hazardous Material and to issue a related written report. Where appropriate, the Owner will engage a licensed abatement contractor to remove the material or render it harmless as directed.

6.12.5.3 The Contractor shall resume Work in the affected area upon written notice from the A/E that **(1)** the suspect material was evaluated and found not to be or contain a Hazardous Material, or **(2)** the suspect material has been removed or rendered harmless.

6.12.5.4 If the Contractor knowingly or negligently proceeds with the Work in an area where a Hazardous Material exists and has not been rendered harmless, the Contractor shall be solely responsible for all related claims, damages, losses, and expenses, including, but not limited to, attorneys' fees, arising out of or resulting from performing the Work in the affected area.

6.12.5.5 The term "rendered harmless" means that the level of exposure is less than any applicable exposure standards set forth in Applicable Law.

6.12.6 Safety Data Sheets.

6.12.6.1 The Contractor shall identify any material it uses at the Site with a Safety Data Sheet ("SDS") meeting the requirements of OSHA's Hazard Communication Standard.

6.12.6.2 The Contractor shall maintain a notebook containing all of its applicable SDSs. That notebook shall be kept at the Site for the duration of the Project.

6.13 Construction Facilities, Utilities, and Equipment

6.13.1 Facilities.

6.13.1.1 The Contractor shall provide and maintain clean and suitable temporary facilities, equipment, services, and enclosed storage for its use at the Site.

6.13.1.2 The Contractor shall provide and maintain in a clean condition:

- .1 suitable facilities, equipment, and services for use by the A/E and Contracting Authority;
- .2 adequate space, equipment, and furnishings to conduct progress meetings, and store approved documents and permits; and
- .3 adequate sanitary facilities for use by all Persons at the Site.

6.13.2 Environmental Controls.

6.13.2.1 The Contractor shall protect its Work and materials from weather and damage from heat, cold, and humidity.

6.13.2.2 Until the permanent HVAC system is complete and available for use:

- .1 the Contractor shall make arrangements and pay for installation and maintenance of temporary heating and ventilating systems; and
- .2 the Contractor shall pay the costs incurred in operating the temporary heating and ventilating systems.

6.13.2.3 When the permanent HVAC system is complete and available for use:

- .1 The Contractor shall start up and maintain operation of the permanent HVAC system, including filters, and promptly remove temporary heating and ventilating systems.
- .2 If the Project consists entirely of new construction, the Contractor shall pay the costs of energy consumed in operating the permanent HVAC system until Substantial Completion.
- .3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the costs of energy consumed in operating the permanent HVAC system.

6.13.2.4 From the date of Substantial Completion, the Owner shall pay the cost of operating the permanent HVAC system for the occupied portion of the Project.

6.13.2.5 If the permanent HVAC system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.13.3 Water and Drainage.

6.13.3.1 The Contractor shall provide water necessary for the Work until the permanent plumbing system is available for use.

6.13.3.2 The Contractor shall provide temporary drainage and dewatering necessary for the Work and shall employ pumps, trenches, drains, sumps, and other necessary elements required to provide satisfactory working conditions for the protection, execution, and completion of the Project.

6.13.3.3 The Contractor shall make arrangements and pay for installation and maintenance of temporary plumbing systems until the permanent plumbing system is available for use.

6.13.3.4 When the permanent plumbing system is complete and available for use:

- .1 The Contractor shall start up and maintain operation of the permanent plumbing systems, and make arrangements and pay for removal of temporary plumbing systems.
- .2 If the Project consists entirely of new construction, the Contractor shall pay the costs of water consumed and sewerage charges until Substantial Completion.
- .3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the costs of water consumed and sewerage charges.

6.13.3.5 From the date of Substantial Completion, the Owner shall pay the costs of water consumed and sewerage charges for the occupied portion of the Project.

6.13.3.6 If the permanent plumbing system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.13.4 Electric Service.

6.13.4.1 The Contractor shall provide temporary light and power; and pay the charges for temporary electric service installation, and removal if required.

6.13.4.2 If the Project consists entirely of new construction, the Contractor shall pay the cost of energy consumed until Substantial Completion.

6.13.4.3 If the Project is a renovation of an existing building or structure, addition(s) to an existing building or structure, or any combination of new construction and renovation work that does not allow separate metering of utilities, the Owner shall pay the cost of energy consumed.

6.13.4.4 From the date of Substantial Completion, the Owner shall pay the cost of energy consumed for the occupied portions of the Project.

6.13.4.5 If the permanent electrical system is used during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.13.5 Hoisting Facilities.

6.13.5.1 The Contractor shall erect and maintain any hoisting equipment required for its Work.

6.13.5.2 If the electric service requirements of hoisting facilities differ from that available at the Site, the Contractor shall provide and pay for all necessary connections.

6.13.5.3 If a permanent elevator is identified in the Contract Documents to be used for hoisting materials or personnel during construction, the Contractor shall furnish an extended warranty and service contract in effect until the expiration of the Correction Period.

6.14 Progress Cleaning

6.14.1 The Contractor shall remove all waste materials, rubbish, and mud attributable to the Work to an appropriate disposal location at, or near, the Site.

6.14.2 The Contractor shall perform weekly broom cleaning of hard flooring surfaces in the area of the Work.

6.14.3 The Contractor shall remove, once each working day or as appropriate for the Project, all waste materials and rubbish from the disposal location at, or near, the Site.

6.14.4 The Contractor shall remove, as appropriate for the Project or as the A/E or Owner directs, any waste materials or rubbish from areas adjacent to the Project.

6.14.4.1 The Contractor shall dispose of waste materials, rubbish, and construction debris in a lawful manner in approved recycling facilities or landfills.

6.14.5 If the Contractor fails to clean up during the progress of the Work, the Contracting Authority may clean up on behalf of the Contractor and at the Contractor's expense. If the Contractor fails to maintain the areas adjacent to the Project clean and free of waste materials and rubbish, the Contracting Authority may also direct the local jurisdiction responsible for the area to have the area cleaned to its satisfaction at the Contractor's expense.

6.14.5.1 The Contracting Authority may deduct the cleaning costs from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.14.6 The Contractor shall remove excavated material and spoil to a suitable off-site location approved by the Contracting Authority.

6.14.6.1 If the Owner designates a location on its property for disposal or storage of clean topsoil and/or subsoil in the Contract Documents, the Contractor shall remove such materials to the designated location.

6.15 Use of Premises

6.15.1 The Contractor shall use corridors, stairs, and elevators as designated by the Contracting Authority. The Contractor shall exercise extreme care to not exceed the carrying capacity of elevators or damage the cab interior in any way.

6.15.2 Loitering or wandering through the interior of buildings or exterior grounds outside the limits of the Work will not be permitted.

6.15.3 The Contractor shall confine its apparatus, materials, and the operations of its workers to the limits indicated by Applicable Law and the directions of the A/E or Project Manager.

6.15.4 No signs or advertising of any kind will be permitted on or about the Site, except those appearing on trucks and trailers.

6.15.5 Site Logistics Plan.

6.15.5.1 The Contractor shall prepare a plan of the Site indicating how the Contractor intends to use the Site. The plan should illustrate, as an example, areas to be used for lay down of material and equipment; office and storage trailer locations; vehicular access gates with ingress and egress routes; locations of wheel wash and concrete truck wash out activities; and offloading and hoisting locations.

6.15.6 Smoking and Tobacco Products.

6.15.6.1 All State buildings are smoke free. Smoking will not be permitted in any indoor area. The ban on tobacco products will be observed in all indoor and outdoor areas and parking areas on all State-owned and leased property. The Contractor shall enforce these restrictions on any individual employed by the Contractor, or a Subcontractor.

6.16 Interruption of Existing Services

6.16.1 Whenever it becomes necessary to interrupt existing services in use by the Owner or its tenants, including but not limited to sewer, water, gas, and steam lines, electric, telephone, and cable service, the Contractor shall continue the associated Work on a non-stop 24-hour per day basis until that Work is completed and the service restored, or at an alternate time required by the Contracting Authority.

6.16.2 Before beginning that Work, the Contractor shall apply in writing to, and receive approval in writing from, the Owner, through the A/E, to establish a time when interruption of the service will cause a minimum of interference with the activities of the Owner and its tenants.

6.17 Explosives and Blasting

6.17.1 The Contractor shall not conduct blasting on, or bring explosives to, the Site without the prior written approval of the Contracting Authority, Owner, and other authorities with jurisdiction.

6.17.2 The Contractor shall perform all blasting, storing, and handling of explosives as required under Applicable Law.

6.17.2.1 The Contractor shall carry appropriate liability insurance coverage, as required by the Contract Documents, for its blasting and explosives storage and handling operations. Immediately upon request, the Contractor shall deliver evidence of that insurance to the Contracting Authority.

6.18 Building Commissioning

6.18.1 If the Project scope includes building commissioning, the Contractor shall participate in the Commissioning Process, as prescribed in the Contract Documents.

6.18.2 The Contractor shall permit the A/E, or a third-party Commissioning Agent ("CxA") if applicable, access to commission performance based equipment, fixtures, and/or systems (e.g., HVAC, fire protection, smoke evacuation, fume hoods, emergency power, etc.), prior to Substantial Completion.

6.18.3 The A/E, or CxA if applicable, shall promptly notify the Contractor in writing of any deficiency identified during the Commissioning Process.

6.18.4 To facilitate the Commissioning Process, the Contractor shall submit four sets of Operation and Maintenance Manuals for dynamic and engineered systems to the A/E, and CxA if applicable, for approval. That submission shall occur within 30 days following approval of all related Contractor submittals required by the Contract Documents.

6.19 Action Submittals

6.19.1 Submittal Description. Shop Drawings, Product Data, Samples, and other submittals for the A/E's review and action shall be provided by the Contractor for any item required by the Contract Documents but not fully described in the Contract Documents, unless waived by the A/E, and include, but are not limited to:

6.19.1.1 construction of the various parts, method of joinery, type of materials, grade, quality and thickness of materials, alloy of materials, profiles of all sections, reinforcement, method of hanging doors or installing windows, anchorage, and type and grade of finish;

6.19.1.2 capacities, types of materials and performance charts that are pertinent to the materials, and performance charts that are pertinent to the equipment item; and

6.19.1.3 wiring diagrams, control diagrams, schematic diagrams, working and erection dimensions, arrangement and specifications.

6.19.2 Form of Submittals. The Contractor shall provide a transmittal letter, review and stamp its approval, and transmit the submittals to the A/E in accordance with the submittal schedule established by the A/E and Contractor.

6.19.2.1 The Contractor shall submit a minimum of one reproducible and three copies of Shop Drawings, and a minimum of four copies of any other submittal, except when using the State's web-based project management software.

6.19.2.2 The data shown on the Shop Drawings shall be complete with respect to quantities, dimensions, specified performance and design criteria, materials, and similar data to communicate to the A/E the materials and equipment that the Contractor proposes to provide.

6.19.2.3 Each Sample shall be identified clearly as to materials, supplier, pertinent data as catalog numbers, the intended use, and other uses as the A/E may require enabling the A/E to review the submittal.

6.19.3 Variation from Contract Documents. If the submittals show variations from the requirements of the Contract Documents, the Contractor shall specifically and clearly identify the variations in its letter of transmittal.

6.19.3.1 Variations that may affect the construction quality, cost or timeline shall be submitted by the A/E to the Contracting Authority for review, and if approved, shall be incorporated into the Work by Change Order.

6.19.3.2 The Contractor shall not be relieved of responsibility for deviations from the Contract Documents by the A/E's approval of submittals.

6.19.3.3 Submittals are not Contract Documents. In the event of conflicts between submittals and the Contract Documents, the Contract Documents take precedence and govern the Work.

6.19.4 Contractor's Submittal Review. The Contractor shall review and stamp "approved" all submittals before forwarding them to the A/E. If it is apparent to the A/E that the Contractor has not reviewed the submittals, or has conducted an incomplete review, the A/E may reject the submittals.

6.19.4.1 The Contractor shall field verify conditions as necessary and make corrections of dimensions, locations of various items, encroachments of work of Separate Contractors, or variations from the requirements of the Contract Documents.

6.19.4.2 If required by the Contract Documents or Applicable Law, the Contractor shall have Shop Drawings or other submittals prepared by Persons possessing expertise and experience in an appropriate trade or profession or by a registered architect, professional engineer, or other professional.

6.19.4.3 By approving and submitting submittals, the Contractor represents that the Contractor has determined and verified materials, field measurements, and field construction criteria related to the associated Work, or shall do so, and has checked and coordinated the information contained within the submittals with the requirements of the Work and of the Contract Documents.

6.19.5 A/E's Submittal Review. The A/E shall review submittals for conformity with design intent within 14 days after receiving them or in accordance with the approved submittal schedule, or other period as mutually agreed by the A/E and Contractor. The A/E's review of submittals is to determine if the items covered by the submittals will, after installation and incorporation into the Work, conform to the Contract Documents and be compatible with the design concept of the Project as a functioning whole.

6.19.5.1 The Contractor shall make corrections required by the A/E and resubmit the required number of corrected copies of submittals until approved, which resubmission shall be acted upon by the A/E within 14 days after receiving them, or other period mutually agreed by the A/E and Contractor.

6.19.5.2 When resubmitting corrected submittals, the Contractor shall direct the A/E's attention to revisions made by noting revisions on the resubmittal.

6.19.5.3 The Contractor shall pay all reasonable costs of the A/E, Owner, and Contracting Authority for attendant delay, interference, hindrance, or disruption of the Project due to excessive resubmittals without fault of the A/E, Owner, or Contracting Authority. Resubmittals in excess of two without fault of the A/E, Owner, or Contracting Authority may be determined excessive by the Contracting Authority.

6.19.5.4 The A/E may hold Samples and other submittals used to coordinate finishes, colors, patterns, textures, or other characteristics until submittals for adjacent materials are available. Within seven days after receiving the submittal, the A/E shall issue a written notice to the Contractor stating that the submittal is being held.

6.19.5.5 If coordinating submittals are not received within the period required for action on previously received submittals that are held in accordance with **Section 6.19.5.4**, review of the previously received submittals may be delayed.

6.19.5.6 The A/E's review shall not extend to means, methods, manners, techniques, sequences, or procedures of construction, or to safety precautions or incident programs.

6.19.5.7 The review and approval of a separate item shall not indicate approval of the assembly in which the item functions.

6.19.6 Risk of Nonpayment. The Contractor shall not commence any portion of the Work requiring Shop Drawings, Product Data, Samples, or other submittals until the submittal has been approved by the A/E. If the Contractor starts Work before the A/E's final approval of the submittal, the Contractor does so at its own risk that payment may not be approved by the Contracting Authority or made by the Owner for the related Work.

6.19.7 Equipment Statement. Shop Drawings on equipment shall include the following written statement from the manufacturer of the equipment:

6.19.7.1 “This equipment submitted for approval shall perform as specified when installed in the arrangement shown on this drawing and in the Contract Documents and in conjunction with all other accessories as flues, breechings, piping, controls, and equipment not furnished by this manufacturer, but required as an accessory or supplement to this equipment, providing that the accessory or supplementary items perform as specified and are installed as shown in the Contract Documents.”

- .1 The Contractor will be deemed to have included the above statement as required even if the associated Shop Drawing does not actually contain the statement.

6.19.7.2 This equipment statement shall not be required for Samples, Product Data, and other standard submittals that are not created specifically for this Project.

6.19.8 Domestic Steel Certifications. The Contractor shall include the following written certifications on the front cover or initial sheet of each structural steel fabrication Shop Drawing, signed and dated prior to fabrication:

6.19.8.1 “Steel Fabricator Certification: The steel fabricator identified below certifies that for this project all load-bearing structural steel has been fabricated or produced, to the best of its knowledge, only from steel made in the United States in accordance with Ohio Revised Code Section 153.011. Further, the steel fabricator hereby certifies that it has read and understands that a monetary penalty for violations may be imposed under the authority of Ohio Revised Code Section 153.99.” This certification shall be followed by the name of the fabrication company, name of the company official signing the certification, the signature of that company official, and the date of that signature.

- .1 The Contractor will be deemed to have included the above certification as required even if the associated Shop Drawing does not actually contain the certification.

6.19.8.2 “Contractor Certification: The contractor identified below certifies that it has required as a condition of purchase, that for this project all load-bearing structural steel shall be fabricated and produced using, to the best of its knowledge, only steel made in the United States in accordance with Ohio Revised Code Section 153.011. Further, the contractor hereby certifies that it has read and understands that a monetary penalty for violations may be imposed under the authority of Ohio Revised Code Section 153.99.” This certification shall be followed by the name of the Contractor company, name of the company official signing the certification, the signature of that company official, and the date of that signature.

- .1 The Contractor will be deemed to have included the above certification as required even if the associated Shop Drawing does not actually contain the certification.

6.20 Warranty

6.20.1 The Contractor warrants to the Contracting Authority and Owner that all materials and equipment furnished under the Contract shall be new and of good quality unless otherwise required or permitted by the Contract Documents, that the Work shall be free from defects not inherent in the quality required or permitted, and that the Work shall conform to the requirements of the Contract Documents. Work not conforming to those requirements, including Substitutions not properly approved and authorized is Defective Work. If required by the A/E, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

6.20.2 If the Contractor or a Subcontractor recommends a particular product, material, system, or item of equipment for incorporation into the Project and the Owner accepts that recommendation, the above warranty includes a warranty from the Contractor to the Owner that the recommended product, material, system, or item of equipment is fit and appropriate for the associated purpose.

6.21 Additional Tests and Inspections

6.21.1 If before or after Substantial Completion the A/E or the Contracting Authority determines that any portion of the Work requires special inspection, testing, or approval not otherwise required under the Contract Documents, the A/E shall order such inspection, testing, or approval.

6.21.1.1 If the special inspection, testing, or approval reveals Defective Work, the Contractor shall pay all associated costs and will not be entitled to any related adjustment of the Contract Times. Those costs may include, but are not limited to:

- .1 the cost of the special inspection, testing, or approval;
- .2 the cost of conducting the special inspection, testing, or approval on similar Work regardless of whether the similar Work is also revealed as Defective Work;
- .3 the cost of additional special inspections, testing, or approvals to evaluate remedial Work;

- .4 the cost of correcting the Defective Work; and
- .5 all related Owner-incurred fees and charges of contractors, engineers, architects, attorneys, and other professionals.

6.21.1.2 The Contracting Authority may deduct the costs described under **Section 6.21.1.1** from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.21.1.3 If the special inspection, testing, or approval reveals that the Work complies with the Contract Documents, and the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of the special inspection, testing, or approval, the Contractor may request a Change Order by giving written notice under **Section 7.3.2** within seven days after the special inspection, testing, or approval.

6.21.2 If the Contractor is aware of a need for inspection, testing, or approval, or of a need to have any inspection, testing, or approval completed by a particular time to avoid delay, then the Contractor shall timely communicate such information to the A/E and Contracting Authority.

6.21.3 Except as described under **Section 6.21.1**, the Owner shall pay for any inspection, testing, or approval that did not become a requirement until after it awarded the Contract.

6.21.4 The Contractor shall coordinate with and give the A/E, Contracting Authority, and Owner reasonable notice of the anticipated dates of all inspections, testing, or approvals.

6.21.5 Within five days after completion of an inspection, testing, or approval, the A/E shall provide an original report/certificate of the inspection, testing, or approval to the Contractor and Contracting Authority with a recommendation for or against acceptance of the results therein.

6.22 Uncovering the Work

6.22.1 If the Contractor covers Work contrary to the requirements of the Contract Documents or contrary to the written request of the Contracting Authority or A/E, the Contractor shall, if the Contracting Authority or A/E requests in writing, uncover that Work for observation, correct it if not in conformity with the Contract Documents, and recover it at the Contractor's expense without adjustment of the Contract Times.

6.22.2 If the Contractor covers Work in accordance with the Contract Documents and not contrary to a request from the A/E or Contracting Authority for an opportunity to observe the Work prior to covering, the Contractor shall, if the A/E requests in writing, uncover that Work.

6.22.2.1 If the uncovered Work is Defective Work, the Contractor shall pay the costs of uncovering, correcting, and recovering the Work and shall not be entitled to an adjustment of the Contract Times.

6.22.2.2 If the uncovered Work is not Defective Work and the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of the uncovering and recovering of the Work, the Contractor may request a Change Order by giving written notice under **Section 7.3.2** within seven days after the Contracting Authority or A/E observes the uncovered Work.

6.23 Correction of the Work

6.23.1 Before Substantial Completion.

6.23.1.1 If the Contractor provides Defective Work or fails or neglects to perform the Work in accordance with the Construction Progress Schedule, the Contracting Authority or A/E may issue a written notice to the Contractor and Contractor's Surety directing the Contractor to correct the Defective Work or recover schedule deficiencies. Unless otherwise specified in that written notice, the Contractor shall promptly commence and diligently pursue correction of the Defective Work and recovery of schedule deficiencies within no more than three days after the Contracting Authority issues the written notice ("72-Hour Notice").

6.23.1.2 If the Contractor fails to promptly commence and diligently pursue correction of the Defective Work and recovery of schedule deficiencies required under **Section 6.23.1.1**, the Owner may correct the Defective Work or take action to recover schedule deficiencies without giving further notice to the Contractor or Contractor's Surety.

6.23.2 After Substantial Completion.

6.23.2.1 In addition to the Contractor's other obligations under the Contract Documents, if any of the Work is found to be Defective Work after Substantial Completion, the Contractor shall correct it promptly after receipt of written notice from the A/E, Contracting Authority, or Owner to do so, unless the Contracting Authority and Owner have previously acknowledged and accepted the Defective Work in writing as described under **Section 6.24.1**. The A/E,

Contracting Authority, or Owner may send a copy of the written notice to the Contractor's Surety, but are not obligated to do so.

6.23.2.2 During the Correction Period. If the Contracting Authority or Owner issues a notice under **Section 6.23.2.1** during the Correction Period, the Owner may correct the Defective Work itself without giving further notice to the Contractor or Contractor's Surety if the Contractor fails to **(1)** notify the Owner in writing of the Contractor's intent to correct the Defective Work within seven days after the Contracting Authority or Owner issues the notice and **(2)** thereafter promptly commence and diligently pursue correction of Defective Work.

6.23.2.3 The Correction Period:

- .1 commences on the date of Substantial Completion of the Work or a designated portion of the Work which the Contracting Authority and Owner have agreed to take Partial Occupancy;
- .2 relates only to the Contractor's specific obligation and opportunity to correct the Work during the Correction Period;
- .3 does not establish a period of limitation with respect to any of the Contractor's other obligations under the Contract Documents;
- .4 has no relationship to the time within which the State or Owner may seek to enforce the Contract;
- .5 does not establish a period of limitation within respect to the commencement of litigation to establish the Contractor's liability under the Contract or otherwise; and
- .6 shall not be extended by corrective Work performed by the Contractor under this **Section 6.23.2**.

6.23.2.4 After the Correction Period. If the Owner issues notice under **Section 6.23.2.1** after expiration of the Correction Period, the Owner may correct the Defective Work without giving further notice to the Contractor or Contractor's Surety if the Contractor fails to **(1)** notify the Owner in writing of the Contractor's intent to correct the Defective Work within 14 days after the Owner issues the notice and **(2)** thereafter promptly commence and diligently pursue correction of Defective Work.

6.23.3 Emergency Correction of Defective Work.

6.23.3.1 Notwithstanding any other provision of the Contract to the contrary, if in the Contracting Authority's or Owner's opinion the Defective Work presents a threat of imminent harm or danger to people, property, or the environment, the Contracting Authority or Owner may order the Contractor to immediately correct Defective Work or the Owner may correct the Defective Work itself without any prior notice to the Contractor or Contractor's Surety.

6.23.4 Responsibility for Costs of Correction.

6.23.4.1 The Contractor shall pay all of the costs and damages associated with the correction of Defective Work and the recovery of schedule deficiencies under this **Section 6.23**. Those costs and damages may include, but are not limited to, the related fees and charges of contractors, engineers, architects, attorneys, and other professionals; and the cost of correcting or replacing adjacent work. The Contracting Authority may deduct those costs and damages from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.24 Acceptance of Defective Work

6.24.1 Before final Contract Completion, the Owner may accept any Defective Work instead of requiring its removal or correction, in which case the Contract Sum must be equitably reduced as described under **Article 7**.

6.24.1.1 The Owner may only accept Defective Work through a deduct Change Order that makes explicit reference to this **Section 6.24**.

6.24.1.2 After final Contract Completion, the Owner may only accept Defective Work by giving written notice to the Contractor that the Owner is accepting the associated Defective Work.

6.24.2 None of the following will constitute **(1)** acceptance of Defective Work, **(2)** a release of the Contractor's obligation to perform the Work in accordance with the Contract, or **(3)** a waiver of any rights set forth in the Contract or otherwise provided by Applicable Law:

- 6.24.2.1** observations or inspections by the Owner, Contracting Authority, or A/E;
- 6.24.2.2** the making of any payment;
- 6.24.2.3** Substantial Completion or the issuance of a Certificate of Substantial Completion;
- 6.24.2.4** Partial Occupancy and the Owner's use or occupancy of the Work or any part of it;

- 6.24.2.5 Contract Completion or the issuance of a partial or final Certificate of Contract Completion;
- 6.24.2.6 any review or approval of a submittal;
- 6.24.2.7 any inspection, test, or approval by other Persons; or
- 6.24.2.8 any correction of Defective Work by the Owner.

6.25 Project Document Maintenance and Submittal

6.25.1 During Construction.

6.25.1.1 The Contractor shall maintain in good order at a secure location on the Site:

- .1 a complete copy of all Contract Documents; Shop Drawings, Product Data, Samples and similar required submittals; manufacturer operating and maintenance instructions; certificates; warranties; RFIs and responses thereto; and other Project-related documents, all marked currently and accurately to record field changes and selections made during construction and to show actual installation where installation varies from Work as originally shown, including the exact location and depth of underground utility lines; and
- .2 a set of Drawings and Specifications, approved in accordance with **Section 5.2.1.1**, and the records required by **Section 6.2.17**.

6.25.1.2 Before submitting each Contractor Payment Request, the Contractor shall record all changes on the Contract Documents, neatly in a contrasting color, noting new information not shown on the original Contract Documents. Failure to record all changes may cause payment to be withheld or delayed by the Contracting Authority.

6.25.1.3 The Contractor shall keep a record of changes made to the Specifications, noting particularly any approved variation from manufacturers' installation instructions and recommendations.

6.25.1.4 If the Contractor uses Shop Drawings to indicate as-built conditions, the Contractor shall cross-reference the Shop Drawing sheet numbers to the corresponding sheet numbers on the Contract Documents. The Contractor shall note related numbers where applicable.

6.25.1.5 The Contractor shall at all times permit access to the documents described in this **Section 6.25.1** to authorized representatives of the State, local authorities having jurisdiction, Contracting Authority, Owner, and A/E.

6.25.2 Before Contract Completion.

6.25.2.1 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and final payment, shall organize the As-Built Documents into manageable sets, bind the sets with durable paper cover sheets, and deliver the As-Built Documents to the A/E.

6.25.2.2 The Contractor's As-Built Documents submission shall include, but is not limited to:

- .1 Certificate of Occupancy;
- .2 inspection certificates for pressure piping, elevator, boiler, electrical, plumbing or piping purification, etc.;
- .3 Letter of Approval from the local fire authority or State Fire Marshal for the fire suppression system;
- .4 Operation and Maintenance Manuals, organized into suitable sets of manageable size. Indexed data bound in individual binders, with pocket folders for folded sheet information and appropriate identification marked on the front and the spine of each binder;
- .5 neatly and accurately marked sets of As-Built Documents, and other Contract Documents reflecting the actual construction of the Project;
- .6 detailed Drawings reflecting the exact location of any concealed utilities, mechanical or electrical systems, and components;
- .7 assignment to the Owner of all warranties and guarantees, including the most-recent address and telephone number of any Subcontractors or manufacturers;
- .8 an affidavit to certify that all Subcontractors have been paid in full for all Work performed or materials furnished for the Project;
- .9 final certified payroll reports; and
- .10 an affidavit to certify that the Contractor and each of its Subcontractors, regardless of tier, have complied with all requirements of ORC Chapter 4115.

6.25.2.3 By submitting the As-Built Documents to the A/E, the Contractor certifies that its As-Built Documents are complete, correct, and accurate.

6.25.3 Record Documents.

6.25.3.1 The A/E shall revise the original Contract Documents and related electronic files with the information contained on the As-Built Documents. The A/E shall label the revised original Contract Documents and related electronic files as “Record Documents” and reflect the date of the A/E’s incorporation of the As-Built Documents.

6.25.3.2 The Owner may thereafter use the Record Documents for any purpose relating to the Project including, but not limited to, additions to or completion of the Project.

6.26 Final Cleaning

6.26.1 Before requesting the Substantial Completion inspection of the Work, the Contractor shall clean the Site, remove waste materials and rubbish attributable to the Project, and restore the property to its original condition so that upon Substantial Completion, the premises are ready for occupancy by the Owner.

6.26.2 If the Contractor performs any Work after final cleaning, the Contractor shall clean the affected area as provided above so that upon Substantial Completion, the premises are ready for occupancy by the Owner.

6.26.3 Final cleaning shall be done to the reasonable satisfaction of the A/E and Contracting Authority.

6.27 Substantial Completion**6.27.1 Contractor’s Punch List.**

6.27.1.1 When the Contractor considers the Work, or a designated portion thereof, Substantially Complete the Contractor shall inspect the Work and prepare a list of Defective Work and incomplete or unacceptable Work (“Contractor’s Punch List”). The Contractor shall list all items of Work not in compliance with the Contract Documents, including items the Contractor is requesting to be deferred.

- .1** The Contractor shall proceed to correct all items listed on the Contractor’s Punch List and certify that the incomplete items listed on the Contractor’s Punch List are to its knowledge an accurate and complete list by signing the Contractor’s Punch List.
- .2** The Contractor’s failure to include an item on the Contractor’s Punch List shall not alter the Contractor’s responsibility to complete the Work in accordance with the Contract Documents.
- .3** The Contractor shall submit the signed Contractor’s Punch List to the A/E, together with a request for the Substantial Completion inspection of the Work.

6.27.2 Substantial Completion Inspection.

6.27.2.1 Within three business days after receipt of the request for the Substantial Completion inspection of the Work, the A/E shall notify the Contractor of acceptance or rejection of the request, stating reasons for any rejection.

- .1** Within seven days after its acceptance of the Contractor’s request, the A/E shall conduct the Substantial Completion inspection to determine whether the Work, or designated portion, is in conformity with the Contract Documents and Substantially Complete. The A/E shall notify the Contractor, Contracting Authority, and Owner of the scheduled time of the inspection.
- .2** If the A/E determines that the Work is Substantially Complete, within three business days after the Substantial Completion inspection, the A/E shall prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion and include a list of Defective, incomplete, or unacceptable Work (“A/E’s Punch List”). The A/E’s Punch List shall include **(1)** the items on the Contractor’s Punch List that are not yet completed or corrected as of the date of the Substantial Completion inspection, and **(2)** comments from the Contracting Authority and Owner.
- .3** The A/E shall submit the Certificate of Substantial Completion to the Contracting Authority, Owner, and Contractor for their written acceptance. Upon their acceptance and consent of the Contractor’s Surety, and subject to the Owner’s right to withhold payment, the Owner shall release retainage as described under **Section 9.7.2.**
- .4** The A/E’s failure to include an item on the A/E’s Punch List shall not alter the Contractor’s responsibility to complete the Work in accordance with the Contract Documents.
- .5** If the A/E accepts the request and subsequently determines that the Work is not Substantially Complete, the A/E may request compensation for expenses related to excessive Punch List activities. The Contracting Authority may deduct that additional compensation to the A/E from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.27.3 Completion of Punch List Items.

6.27.3.1 Before expiration of the Punch List Milestone and before the date of Final Contract Completion, the Contractor shall complete all items on the A/E's Punch List. After completing all items on the A/E's Punch List, the Contractor shall provide a written request for Final Inspection of the Work to the A/E.

- .1** If Work on the A/E's Punch List cannot be timely completed, the Contractor shall justify in writing to the reasonable satisfaction of the Contracting Authority and A/E, the reasons the items cannot be completed, and the Contractor may propose, for the Contracting Authority and A/E's approval, an adjustment of the Punch List Milestone for the associated Punch List items to establish a time when the Contractor shall complete those items.
- .2** Within three business days after receipt of the request for the Final Inspection of the Work, the A/E shall complete a Final Inspection of the Work for compliance with the Contract Documents.
- .3** If multiple inspections of items on the A/E's Punch List are required due to the Contractor's failure to properly and timely complete them, the Contractor shall pay any additional costs incurred by the A/E, Owner, and Contracting Authority resulting from any attendant delay. The Contracting Authority may deduct those additional costs from payments then or thereafter due the Contractor. If payments then or thereafter due the Contractor are not sufficient to cover those amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

6.28 Partial Occupancy

6.28.1 The Owner may occupy or use a portion of the Project prior to Substantial Completion of all Work if:

6.28.1.1 the building authority with jurisdiction over the Project issues a partial certificate of occupancy for the portion of the Project the Owner intends to occupy;

6.28.1.2 the Owner with the Contractor's and A/E's assistance has provided written notice of the Partial Occupancy to the insurers providing builder's risk property insurance for the Project; and

6.28.1.3 the Contracting Authority has received notice of the Partial Occupancy from the A/E and has consented to it.

6.28.2 Before the Owner commences Partial Occupancy, the Owner, Contracting Authority, A/E, and Contractor shall proceed as described under **Section 6.27** for the area designated for Partial Occupancy.

6.28.3 The Contractor shall be relieved of the obligation to maintain the area accepted for Partial Occupancy, but shall remain obligated to complete and correct the Work and to carry the insurance required by the Contract Documents during performance of any such Work.

6.29 Demonstration and Training, Operating Appurtenances

6.29.1 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and final payment, shall perform demonstration and training of the Owner's maintenance personnel as specified in the Contract Documents.

6.29.2 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and final payment, shall organize and submit operating appurtenances and loose items related to operation and maintenance of the completed Project to the Owner, including, but not limited to:

6.29.2.1 keys to door and window hardware, panels, and other devices not directly provided to the Owner from the manufacturer;

6.29.2.2 operating handles, levers, cranks, specialized wrenches or drivers, remote controls, and similar items; and

6.29.2.3 extra materials (e.g., attic stock).

6.30 Contract Completion**6.30.1 Partial Contract Completion.**

6.30.1.1 When items of Work cannot be completed until a subsequent date, the A/E shall prepare a partial Certificate of Contract Completion that shall include a detailed list of the deferred Work and the date(s) by which the Contractor will complete that Work.

6.30.1.2 The A/E shall submit the partial Certificate of Contract Completion to the Contracting Authority, Owner, and Contractor for their written acceptance. Upon their acceptance of the partial Certificate of Contract Completion

and consent of the Contractor's Surety, the Contracting Authority may release payment to the Contractor, as determined in the sole discretion of the Contracting Authority.

6.30.2 Final Contract Completion.

6.30.2.1 When all items on the A/E's Punch List have been completed to the satisfaction of the A/E, all requirements of the Contract Documents have been completed, and the provisions of **Sections 6.25 through 6.29** have been fulfilled, the A/E shall prepare and recommend execution of a final Certificate of Contract Completion.

6.30.2.2 The date that the Contracting Authority executes the final Certificate of Contract Completion is the date of Contract Completion.

ARTICLE 7 - MODIFICATIONS

7.1 General

7.1.1 Changes in the Work.

7.1.1.1 The Contracting Authority may order changes in the Work without invalidating the Contract. Subject to the limitations stated in this **Article 7** and elsewhere in the Contract Documents, a change in the Work may be accomplished by a Change Order, Change Directive, or order for a minor change in the Work.

- .1** The Contractor shall proportionately increase the amount of the Bond whenever the Contract Sum is increased.
- .2** If notice of any change affecting the Contract is required by the provision of any Bond, notice is the Contractor's responsibility, and the amount of each applicable Bond shall be adjusted accordingly.

7.1.1.2 The Contractor shall not proceed with any change in the Work without the Contracting Authority's prior written authorization except as provided under **Sections 1.10 and 7.5**.

7.1.1.3 Except as provided in **Section 1.10**, the Contractor's failure to obtain prior written authorization for a change in the Work constitutes a waiver by the Contractor of an adjustment to the Contract Sum or Contract Times, or both, for the related Work.

7.1.1.4 The Contractor shall perform all changes in the Work under the applicable provisions of the Contract Documents, and the Contractor shall proceed promptly with the change unless otherwise provided in the Change Order, Change Directive, or order for a minor change in the Work

7.1.2 Paperwork Consolidation.

7.1.2.1 Related Modifications, with the same or similar justification (e.g., Owner Request or field resolution), may be consolidated into the same Change Order.

7.1.2.2 Add and deduct Modifications, with the same or similar justification, may be included on the same Change Order.

7.1.2.3 Modifications resulting from errors or omissions shall not be combined with other modifications for which the A/E will receive a fee.

7.1.3 Modification Numbering.

7.1.3.1 The A/E shall assign a number to each Modification, which shall uniquely identify it.

7.1.3.2 The A/E shall not duplicate or reuse any number throughout the Project or reuse assigned numbers for Proposal Requests that are initiated but cancelled in process.

7.1.3.3 The number for each Change Order shall be coordinated with any associated Proposal Request or Change Directive.

7.1.4 Modification Log.

7.1.4.1 The A/E shall create and maintain a Modification Log for the Project, which shall contain the following minimum information:

- .1** number of the Modification;
- .2** a brief description of the Modification;
- .3** cost of the Modification;
- .4** schedule impact of the Modification; and
- .5** dates sent to, and received from, the parties.

7.1.5 Reconciliation of Unit Price Items.

7.1.5.1 The Contracting Authority may increase, decrease, or delete entirely the scheduled quantities of Unit Price Work.

7.1.5.2 The A/E shall issue a Change Order to reconcile the difference between the scheduled and actual quantities of Unit Price Work performed and materials furnished.

7.1.5.3 If the actual quantity of a Unit Price item differs from the scheduled quantity by 20 percent or more, so that application of the Unit Price to the quantities of Work proposed would create an undue hardship on either the Owner or Contractor, the A/E shall issue a Proposal Request and subsequent Change Order to adjust the Unit Price.

- .1** If a Unit Price is adjusted as described under **Section 7.1.5.3**, the new Unit Price will only apply to the units of Work performed that are **(1)** less than the 20 percent threshold if the Unit Price is changed on account of an over-estimation of the scheduled quantity of a Unit Price item involved in the Work or **(2)** in excess of the 20 percent threshold if the Unit Price is changed on account of an under-estimation of the scheduled quantity of a Unit Price item involved in the Work.

7.1.5.4 If the actual quantity of a Unit Price item exceeds the scheduled quantity by 20 percent or more, the Contractor shall immediately notify the A/E, who shall issue a Change Directive and subsequent Change Order to authorize an adjustment in the scheduled quantity.

7.1.6 Notice of Credits and Schedule Reductions.

7.1.6.1 Notwithstanding any other provision of the Contract to the contrary, the Contractor shall promptly notify the Contracting Authority, Owner, and A/E in writing whenever any change in the Project (including without limitation through an order for a minor change in the Work) may entitle the Owner to a credit from the Contractor or a reduction of the time for completion of the Project.

7.2 Change Order Procedure

7.2.1 A Change Order is a written instrument prepared by the A/E and executed by the Contracting Authority and Contractor, stating their agreement upon all of the following:

7.2.1.1 a change in the Work;

7.2.1.2 the amount of the adjustment of the Contract Sum, if any; and

7.2.1.3 the extent of the adjustment of the Contract Times, if any.

7.2.2 Except with the Contracting Authority's written consent as explicitly provided under **Section 7.4.8**, the Contractor is not entitled to reserve any rights or take other similar action with respect to a Change Order if the effect or intent of the reservation or action would be to accommodate a further adjustment of the Contract Sum or Contract Times, or both, after the Contractor signs the Change Order. By signing a Change Order, the Contractor irrevocably certifies that the elements of a Change Order described in **Section 7.2.1** are completely and fully satisfied, and waives all rights, if any, to seek further adjustment of the Contract Sum or Contract Times, or both, at a later date with respect to the associated change in the Work including without limitation on account of **(1)** the "cumulative impact" of the associated change in the Work in combination with one or more other changes in the Work; **(2)** all direct and indirect costs, including interest on those costs; and **(3)** any delays, inefficiencies, disruptions, suspensions, extended overhead, and acceleration.

7.2.3 The A/E shall prepare each Change Order form, attach the supporting documentation, and issue the Change Order to the Contractor for signature.

7.2.4 If the Contractor is in agreement with the Change Order under **Section 7.2.1**, the Contractor shall sign and return the Change Order to the A/E within three days after receiving it.

7.2.5 When the A/E receives the Change Order signed by the Contractor, the A/E will recommend approval by signing the form and transmitting the Change Order and the revised Change Order Log to the Owner.

7.2.6 When the Owner receives the Change Order, the Owner may sign the form accepting the Change Order, attach certification of funding, and transmit the Change Order to the Contracting Authority; or, if the Owner does not accept the Change Order, the Owner will reject and return it to the A/E.

7.2.7 When the Contracting Authority receives the Change Order, the Contracting Authority may sign the form approving the Change Order, and transmit the fully executed Change Order to all signers; or, if the Contracting Authority does not accept the Change Order, the Contracting Authority will reject and return it to the A/E.

7.2.8 When the Change Order is signed by the Contractor, A/E, Owner, and Contracting Authority, the fully executed Change Order modifies the Contract Documents and authorizes and directs the Contractor to proceed, and the Contractor shall promptly proceed with the associated change in the Work.

7.3 Initiation of Change Orders

7.3.1 Proposal Request.

7.3.1.1 The A/E shall prepare and issue a Proposal Request to the Contractor to obtain the Contractor's Proposal for the adjustment of the Contract Sum or the Contract Times, or both, associated with a contemplated Modification.

- .1** In any Proposal for an adjustment of the Contract Sum, the Contractor shall specifically identify the items set forth in **Section 7.7**.
- .2** In any Proposal for an adjustment of the Contract Times, the Contractor shall specifically identify the items set forth in **Section 7.8**.
- .3** The Contractor's cost of preparing and providing Proposals is included in the Contract Sum.

7.3.1.2 The Contractor shall respond with a Proposal to the A/E and Contracting Authority within 14 days after receiving the Proposal Request. The allowable time for the Contractor's response may be extended by written agreement of the Contractor and A/E.

7.3.1.3 The Contractor shall hold the Proposal valid and open for acceptance for at least 45 days. The acceptance period may be adjusted by mutual consent of the Contractor and Contracting Authority. The time limits described under this **Section 7.3.1.3** apply only to Proposals submitted in response to a Proposal Request.

7.3.1.4 A Proposal may be accepted by the Contracting Authority only through a Change Order. A Proposal Request does not authorize the Contractor to proceed with a change in the Work.

7.3.1.5 If the Contractor does not timely submit a Proposal within the time required in **Section 7.3.1.2**, the Contractor waives its right to an adjustment to the Contract Sum or Contract Times, or both, associated with the contemplated change in the Work.

7.3.2 Request for Change Order.

7.3.2.1 The Contractor may initiate a change in the Work by submitting written notice to the A/E accompanied by a Proposal meeting the requirements of **Section 7.3.1**.

7.4 Change Directives

7.4.1 A Change Directive is a written order prepared by the A/E and executed by the Contracting Authority directing a change in the Work and may, if necessary:

- 7.4.1.1** state a proposed basis for adjustment, if any, in the Contract Sum or Contract Times, or both; or
- 7.4.1.2** limit the scope of the change in the Work on a time and materials basis, not to exceed a fixed adjustment of the Contract Sum.

7.4.2 If a change in the Work must start immediately to avoid an imminent impact to the schedule of the Project, the A/E may prepare a Change Directive for the Contracting Authority's and the Owner's signatures pursuant to **Section 7.4.1**, authorizing the Contractor to proceed.

7.4.3 A Change Directive shall be used to direct a change in the Work in the absence of total agreement on the terms of a Change Order.

7.4.3.1 For the purposes of clarity, the Contract refers to a Change Directive as if it is only to be used in the absence of total agreement on the terms of a Change Order concerning the associated change of the Work. A Change Directive may also be used in the absence of agreement as to whether the subject of the Change Directive actually constitutes a change in the Work; such as the situation described under **Section 7.5.3**.

7.4.4 Upon receipt of a Change Directive, the Contractor shall promptly proceed with the change in the Work involved.

7.4.5 The Contractor may sign the Change Directive to accept the proposed basis for adjustment, if any, of the Contract Sum or Contract Times, or both. Thereafter, the A/E shall prepare and the A/E, Contracting Authority, Owner, and Contractor shall promptly execute an associated Change Order as described under **Section 7.2**.

7.4.6 Within 14 days after receiving the Change Directive, the Contractor shall respond with a Proposal meeting the requirements of **Section 7.3.1** to the A/E and Contracting Authority for adjustment of the Contract Sum or Contract Times, or both, on account of the change, unless the Change Directive is performed on a time and materials basis under

Section 7.4.1.2. If the Change Directive is performed on a time and materials basis, the Contractor shall submit its Proposal within seven days after completing the Work.

7.4.6.1 The Proposal for the adjustment of the Contract Sum, if any, shall include: **(1)** written documentation as described under **Section 7.7**; and **(2)** a written statement from the Contractor that the proposed adjustment is the entire adjustment in the Contract Sum associated with the change.

7.4.6.2 The Proposal for the change in the Contract Times, if any, shall include: **(1)** written documentation as described under **Section 7.8**; and **(2)** a written statement from the Contractor that the proposed adjustment is the entire adjustment of the Contract Times associated with the change.

7.4.7 If the Contractor does not respond to a Change Directive as required under **Section 7.4.5** or **Section 7.4.6**, the Contracting Authority shall determine the adjustments, if any, of the Contract Sum and Contract Times, and the A/E shall prepare a Change Order consistent with that determination. Notwithstanding any other provision of the Contract to the contrary, that Change Order will modify the Contract Documents when it is signed by the Owner and Contracting Authority. If the Contractor does not agree with the Contracting Authority's determination, the Contractor shall initiate a Claim under **Article 8** within ten days after the date that the Contracting Authority issues its determination, and the Contractor's failure to do so shall constitute an irrevocable waiver of the Claim.

7.4.8 Pending final determination of the total adjustment of the Contract Times on account of a Change Directive, the period of time not in dispute for that change in the Work may be included in the Construction Progress Schedule accompanied by a Change Order indicating the parties' agreement with part or all of the time adjustment.

7.4.9 If the Contracting Authority, Owner, and Contractor agree on the adjustments of the Contract Sum and Contract Times associated with a Change Directive, the A/E shall prepare an appropriate Change Order within seven days after receiving the Contractor's Proposal. The A/E, Contracting Authority, Owner, and Contractor shall promptly sign the Change Order as described under **Section 7.2**.

7.4.10 If the Contracting Authority, Owner, and Contractor do not agree on the adjustments of the Contract Sum and Contract Times associated with a Change Directive within 60 days after the Change Directive is issued, the Contracting Authority shall determine the adjustments, if any, of the Contract Sum and Contract Times, and the A/E shall prepare a Change Order consistent with that determination. Notwithstanding any other provision of the Contract to the contrary, that Change Order will modify the Contract Documents when it is signed by the Owner and Contracting Authority. If the Contractor does not agree with the Contracting Authority's determination, the Contractor shall initiate a Claim under **Article 8** within ten days after the date that the Contracting Authority issues its determination, and the Contractor's failure to do so shall constitute an irrevocable waiver of the Claim.

7.5 Minor Changes in the Work

7.5.1 The A/E may order minor changes in the Work not involving adjustment of the Contract Sum or extension of the Contract Times and not inconsistent with the intent of the Contract Documents. Those changes shall be effected by written order issued to the Contractor.

7.5.2 The Contractor shall promptly carry out each order for a minor change in the Work if the Contractor agrees that the order does not involve adjustment of the Contract Sum or Contract Times, or both.

7.5.3 If the Contractor reasonably believes that it would be entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of an order for a minor change in the Work, the Contractor, within three business days after receiving the order, shall give the Contracting Authority and A/E written notice of the Contractor's position, and not proceed with the subject Work without first receiving a Change Directive or Change Order related to it.

7.5.4 The Contractor waives its right to an adjustment of the Contract Sum or Contract Times on account of an order for a minor change in the Work by:

7.5.4.1 starting the Work that is the subject of the order for a minor change in the Work; or

7.5.4.2 failing to give the notice described under **Section 7.5.3** within three business days after receiving the order for a minor change in the Work.

7.6 Differing Site Conditions

7.6.1 If the Contractor encounters a Differing Site Condition, the Contractor shall stop Work on that Differing Site Condition and give immediate written notice of the condition to the A/E and Contracting Authority.

7.6.1.1 The Contractor's failure to give notice of the Differing Site Condition as required under this **Section 7.6.1** shall constitute an irrevocable waiver of any associated Claim.

7.6.1.2 The written notice of a Differing Site Condition under this **Section 7.6.1** shall be required before the notice of Claim under **Article 8**.

7.6.2 Promptly after receiving notice from the Contractor under **Section 7.6.1**, the A/E shall investigate to determine whether the Contractor has encountered a Differing Site Condition. The A/E shall give written notice of its determination to the Contracting Authority and Contractor within ten days after completing the investigation.

7.6.2.1 If the A/E determines that the Contractor has encountered a Differing Site Condition and the Contracting Authority agrees with the A/E's determination, the A/E shall process an appropriate Change Order.

7.6.2.2 If the A/E determines that the Contractor has encountered a Differing Site Condition but the Contracting Authority disagrees with the A/E's determination, the A/E shall process an appropriate Change Directive through which the Contracting Authority may convey its disagreement with the A/E's determination.

7.6.2.3 If the A/E determines that the Contractor has not encountered a Differing Site Condition and the Contractor does not agree with that determination, the Contractor must initiate a Claim under **Article 8** within ten days after the date that the A/E issues its determination.

7.7 Change Order Cost or Credit Determination

7.7.1 General.

7.7.1.1 The maximum cost or credit resulting from a change in the Work shall be determined as described below.

- .1** Proposals shall include the information required by **Section 7.7.1.4**.
- .2** A Unit Price Proposal shall only be valid when incorporated into the Contract by Change Order.
- .3** The maximum cost or credit includes all compensation for impact costs. Additional costs for impacts shall not be allowed.

7.7.1.2 The Contractor shall not assign any portion of the Work to another Person whereby the Contractor would benefit directly or indirectly from the double application of charges for overhead or profit.

Example: Assume that **(1)** the Contractor is or is capable of self-performing general trades Work and **(2)** the change in the Work includes both electrical trade Work and general trades Work. The Contractor may not assign the general trades Work to the Contractor's electrical Subcontractor and then perform that general trades Work as a sub-subcontractor to the Contractor's electrical Subcontractor.

7.7.1.3 The Contracting Authority may require notarized invoices for material costs and may audit the records of the Contractor and Subcontractors.

7.7.1.4 For each change in the Work, the Contractor shall furnish a detailed Proposal itemized on the **Proposal Worksheet Summary Form (Contractor)** published by the Ohio Facilities Construction Commission through which the Contractor shall document the related changes in the Contract Sum as described under **Section 7.7.2**. Any Subcontractor pricing shall be itemized on the appropriate **Proposal Worksheet Summary Form**.

7.7.1.5 **Section 7.7.2** establishes the exclusive and maximum amount that the Owner shall pay for any Change Order, including, but not limited to, all amounts for interference with, delay, hindrance, disruption of, or impact on the Work ("Pricing Criteria"). These Pricing Criteria also govern the value of deduct Change Orders and the Contractor's entitlement to additional compensation or damages through the Claims and dispute resolution processes on account of changes in the Work. In order to expedite the review and approval process, Proposals shall be prepared in the categories and order listed in **Section 7.7.2**.

7.7.2 Pricing Criteria.

7.7.2.1 Contractor Personnel Costs. Any cost or credit arising from a change in the quantity of the Contractor's on-Site management (including supervision and administrative personnel) not subject to prevailing wage under ORC Chapter 4115 shall be calculated on an hourly basis according to the rates acceptable to the Contracting Authority.

- .1** In no event will the Contractor be entitled to an increase in the Contract Sum on account of Contractor Personnel Costs unless the Contractor actually incurs additional Contractor Personnel Costs solely on account of the associated change in the Work.
- .2** Under no conditions will the increase under this **Section 7.7.2.1** exceed those additional Contractor Personnel Costs the Contractor actually incurs.

7.7.2.2 Labor. Any cost or credit arising from a change in the quantity of field labor directly involved in the Work shall be based upon the actual rate of pay to the worker. If the Project is subject to payment of prevailing wage rates, field labor shall be paid according to the relevant classification of labor as established in the applicable prevailing

wage determination for the Project locality, as determined by the Ohio Department of Commerce, Wage and Hour Bureau.

- .1 In no event will the Contractor be entitled to an increase in the Contract Sum on account of labor costs unless the Contractor actually incurs additional labor costs solely on account of the associated change in the Work.
- .2 Under no conditions will the increase under this **Section 7.7.2.2** exceed those additional labor costs the Contractor actually incurs.
- .3 The cost for supervision above the level of working forepersons (such as general forepersons, superintendent, project manager, etc.) is included in the adjustment under **Section 7.7.2.1** for the Contractor and under **Section 7.7.2.10** for Subcontractors.

7.7.2.3 Fringes. Fringe benefit credit for labor provided under **Section 7.7.2.2** is only allowable for prevailing wage fringe benefits pursuant to ORC Chapter 4115, including, but not limited to, Health and Welfare, vacation, apprenticeship training, and certain types of pension plans. The parties shall defer to the Ohio Department of Commerce's policy on which benefits are granted fringe benefit credit. Each fringe benefit for which credit is requested shall be calculated on an hourly basis and listed as a separate line item. The Contractor shall submit documentation supporting the calculation of the amounts for each fringe benefit for each worker classification, including labor provided by Subcontractors.

7.7.2.4 Allowable Payroll Expenses. Allowable payroll expenses for labor provided under **Section 7.7.2.2** including payroll taxes as well as other benefits that are required by Applicable Law, such as federal and state Unemployment and Workers' Compensation shall each be a separate line item and shall not be credited for compliance with ORC Chapter 4115.

7.7.2.5 Equipment Rentals. Any cost or credit arising from a change in the quantity of non-owned heavy or specialized equipment shall be based on the documented rental cost, but shall not exceed 100 percent of that documented cost. No rental charges shall be allowed for hand tools, minor equipment, simple scaffolds, etc. Downtime due to repairs, maintenance, and weather delays shall not be allowed. Contractor shall submit copies of actual paid invoices to substantiate rental costs.

7.7.2.6 Owned Equipment. Any cost or credit arising from a change in the quantity of heavy or specialized equipment owned by the Contractor or Subcontractor performing the Work shall be based on the cost listed by the current edition of the Associated Equipment Distributors' *AED Green Book* heavy equipment rental rates, but shall not exceed 100 percent of that documented cost. No recovery shall be allowed for hand tools, minor equipment, simple scaffolds, etc. The longest period of time that the equipment is to be required for the Work shall be the basis for the pricing. Downtime due to repairs, maintenance, and weather delays shall not be allowed.

7.7.2.7 Trucking. Any cost or credit arising from a change in the quantity of trucking shall be based on a reasonable delivery charge or per-mile trucking charge for delivery of required materials or equipment. Charges for use of a pick-up truck shall not be allowed.

7.7.2.8 Materials. Any cost or credit arising from a change in the quantity of materials incorporated into the changed Work shall be based on the actual cost (including all discounts, rebates or related credits) of those materials. Documentation shall show costs, quantities, or Unit Prices of all items, as appropriate.

- .1 The cost or credit for reusable materials (e.g., concrete form lumber, shoring, or temporary enclosures) shall be limited to 33 percent of the material cost for each use.

7.7.2.9 Contractor's General Conditions Costs. Any cost or credit arising from a change in the quantity of the Contractor's General Conditions Costs shall be limited to the extent to which the change is attributable to an associated change in the Contract Time for achievement of Substantial Completion resulting from the change in the Work.

- .1 In no event shall the Contract Sum adjustment per day of Contract Time adjustment exceed an amount equal to (1) the sum of the General Conditions Costs line items in the Contractor's Schedule of Values approved by the Contracting Authority, (2) divided by the total number of days of the original Contract Time for achievement of Substantial Completion.
- .2 The Contractor shall (1) exclude the Bond premium from the Schedule of Values for the purposes of the calculation under **Section 7.7.2.9.1**, and (2) include the actual adjustment of the Bond premium attributable to an associated change in the Contract Sum.
- .3 If the Contractor purchases the builder's risk insurance for the Project, the Contractor shall (1) exclude the builder's risk insurance premium from the Schedule of Values for the purposes of the calculation under **Section 7.7.2.9.1**, and (2) include the actual adjustment of the builder's risk insurance premium attributable to an associated change in the Contract Sum.

7.7.2.10 Subcontractor Overhead and Profit. Any cost or credit arising from a change in Subcontractor-performed Work shall include the Subcontractor's aggregate overhead and profit allowance equal to 15 percent of the sum of the Subcontractor's costs described under **Sections 7.7.2.2 through 7.7.2.8** that are associated with that changed Work.

- .1 The allowance applies to each Subcontractor tier. The Contractor is not entitled to recover overhead and profit under **Section 7.7.2.10** on account of changes in Contractor self-performed Work or Work the Contractor performs as a Subcontractor at any tier.

Example: Assume that (1) the Contractor is self-performing general trades Work and (2) the change in the Work includes both \$25,000 of electrical trade Work and \$10,000 of general trades Work. Under this **Section 7.7.2.10**, (1) the Contractor's Subcontractor would be entitled to overhead and profit mark-up but (2) the Contractor would not be entitled to any mark-up. Under **Section 7.7.2.11**, the Contractor would be entitled to Contractor's Fee mark-up on its self-performed Work and on the electrical Work. The amount of the Change Order would be calculated as follows: Subcontractor Change Order = \$25,000 + (\$25,000 x 15%) = \$28,750; Contractor Change Order = \$10,000 + \$28,750 + ((\$10,000 + \$28,750) x 10%) = \$42,625.

- .2 The allowance covers: the costs required to schedule and coordinate the Work, telephone, telephone charges, facsimile, telegrams, postage, photos, photocopying, hand tools, simple scaffolds (one level high), tool breakage, tool repairs, tool replacement, tool blades, tool bits, home office estimating and expediting, home office clerical and accounting support, home office labor (management, supervision, engineering), all other home office expense, legal services, travel, and parking expenses.
- .3 An exception is allowed for shop or engineering labor on items in **Section 7.7.2.10.2**, which shall not be subject to Prevailing Wage rates for steel fabricators, sheet metal fabricators, and sprinkler system fabricators performing work off Site. Recovery for these matters shall be allowed on an hourly basis under items in **Sections 7.7.2.2, 7.7.2.3, and 7.7.2.4** of these Pricing Criteria.
- .4 An exception is allowed for field supervision labor on items in **Section 7.7.2.10.2**, for those portions of the Change Order Work that will be performed, or was performed, at times when the superintendent is not required to be on Site under **Section 6.4**, including but not limited to overtime hours due to acceleration and extensions of the Contract Times. Recovery for this matter will be allowed on an hourly basis under items in **Sections 7.7.2.2, 7.7.2.3, and 7.7.2.4** of these Pricing Criteria.

7.7.2.11 Contractor's Fee. Any cost or credit arising from a change in the Work shall include an allowance for the Contractor's Fee equal to (1) ten percent times (2) the sum of the costs described under **Sections 7.7.2.1 through 7.7.2.10** that are associated with that changed Work.

7.7.2.12 Miscellaneous. Any cost or credit arising from a change in Work may include the following costs with no allowance for Contractor's Fee under **Section 7.7.2.11** or Subcontractor overhead and profit under **Section 7.7.2.10**.

- .1 The premium portion only for approved overtime (labor and fringes). The straight time portion is included in items in **Sections 7.7.2.2, 7.7.2.3, and 7.7.2.4**.
- .2 State sales tax shall be allowed on items as defined by **Section 12.7**.

7.7.3 Costs that shall not be reimbursed for Change Order Work include the following:

7.7.3.1 Voluntary employee deductions including, but not limited to, deductions for charitable donations or U.S. savings bonds.

7.7.3.2 Employee profit sharing.

7.8 Time Extension

7.8.1 Every adjustment of the Contract Times associated with any change in the Work shall be determined as provided in this **Section 7.8**, which establishes the Contractor's maximum entitlement for any change in the Work, including without limitation all adjustments for interference, delay, hindrance, disruption of, or impact on the Work. This **Section 7.8** also governs time adjustments for deduct Change Orders and the Contractor's entitlement to additional time through the claims and dispute resolution processes on account of changes in the Work.

7.8.2 The Contractor shall substantiate all changes in the Contract Times with:

- 7.8.2.1** a written description of the nature of the interference, disruption, hindrance, or delay;
- 7.8.2.2** identification of Persons and events responsible for the interference, disruption, hindrance, or delay;
- 7.8.2.3** date or anticipated date of commencement of the interference, disruption, hindrance, or delay;

7.8.2.4 identification of activities by schedule activity number and name on the Construction Progress Schedule, which may be affected by the interference, disruption, hindrance, or delay, or new activities created by the interference, disruption, hindrance, or delay and the relationship with existing activities;

7.8.2.5 anticipated duration of the interference, disruption, hindrance, or delay and of any remobilization period;

7.8.2.6 specific number of days of extension requested and specific number of days for remobilization requested;

7.8.2.7 recommended action to avoid or minimize any future interference, disruption, hindrance, or delay; and

7.8.2.8 a detailed written proposal as described under **Section 7.7** for an increase in the Contract Sum which would fully compensate the Contractor for all costs of acceleration of the Work needed to completely overcome the associated delay, if any.

7.8.3 Critical Path. Time extensions shall depend upon the extent to which the Work on the critical path of the Construction Progress Schedule is affected, if applicable.

7.8.3.1 A Change Order granting a time extension may provide that the Contract Times shall be extended for only those specific elements so interfered with, disrupted, hindered, or delayed and related remobilization and that remaining Milestone dates shall not be altered and may further provide for adjustment of Liquidated Damages.

7.9 Examination and Audit of Contractor's Records

7.9.1 The Contracting Authority and Owner may examine all books, records, documents and other data of the Contractor and its Subcontractors related to the bidding, pricing, or performance of the Work for the purpose of evaluating any Contractor Payment Request, Proposal, Modification, or Claim.

7.9.2 The above referenced materials shall be made available at the office of the Contractor or Subcontractor, as applicable, at all reasonable times for inspection, audit, and reproduction until the expiration of six years after the date of Substantial Completion of all Work.

7.9.2.1 The Contractor shall maintain and require its Subcontractors to maintain complete and accurate business records at its principal place of business. If the principal place of business is greater than 50 miles from the Site, the Contractor shall timely make records available, and shall require its Subcontractors to timely make records available, at the office of the Contracting Authority or Owner upon request for the records.

7.9.3 To the extent that the Contractor or Subcontractor, as applicable, informs the Contracting Authority or Owner in writing that any documents provided to the Contracting Authority or Owner are trade secrets, the Contracting Authority or Owner shall treat those documents, to the extent permitted by law, as trade secrets of the Contractor or Subcontractor, as applicable.

7.9.3.1 If a dispute arises with any other Person about whether that Person should be given access to the documents, the Contractor or Subcontractor as applicable, shall indemnify the Contracting Authority and Owner against all costs, expenses, and damages, including but not limited to attorneys' fees, incurred or paid by reason of that dispute.

7.9.4 The right of inspection, audit, and reproduction extends to all documents necessary to permit adequate evaluation of the cost of pricing data submitted along with the computations and projections used therein.

7.9.5 If the Contract has been terminated in whole or in part, the records relating to the Work terminated shall be made available to the Contracting Authority or Owner for a period of six years from the date of any applicable final settlement or payment, as applicable.

7.9.6 Records that relate to disputes, litigation, or settlement of Claims arising out of the performance of the Work shall be made available until the dispute, litigation or Claims have been finally decided or settled.

ARTICLE 8 - DISPUTE RESOLUTION

8.1 Initiation of a Claim

8.1.1 Every Claim shall accrue upon the date of occurrence of the event giving rise to the Claim.

8.1.2 The Contractor shall initiate every Claim by giving written notice of the Claim to the A/E and Contracting Authority within ten days after occurrence of the event giving rise to the Claim, with the following exceptions:

8.1.2.1 The ten-day time limit on initiating a Claim arising from a determination of the Contracting Authority concerning a Change Directive begins to run on the date that the Contracting Authority issues its determination under **Section 7.4.7** or **Section 7.4.10**, as applicable.

8.1.2.2 The ten-day time limit on initiating a Claim arising from the response of the A/E to an RFI begins to run on the date that the A/E issues the A/E's response to the RFI.

8.1.2.3 The ten-day time limit on initiating a Claim arising from the A/E's determination concerning a Differing Site Condition begins to run on the date that the A/E issues the A/E's determination under **Section 7.6**.

8.1.3 The Contractor's written notice of a Claim shall provide the following information to permit timely and appropriate evaluation of the Claim, determination of responsibility, and opportunity for mitigation:

8.1.3.1 nature and anticipated amount of the impact, including all costs for any interference, disruption, hindrance, or delay, which shall be calculated in accordance with **Section 7.7** and be a fair and reasonably accurate assessment of the damages suffered or anticipated by the Contractor;

8.1.3.2 identification of the circumstances responsible for causing the impact, including, but not limited to, the date or anticipated date, of the commencement of any interference, disruption, hindrance, or delay;

8.1.3.3 identification of activities on the Construction Progress Schedule that will be affected by the impact or new activities that may be created and the relationship with existing activities;

8.1.3.4 anticipated impacts and anticipated duration of any interference, disruption, hindrance, delay, or impact, and any remobilization period;

8.1.3.5 the Contractor's planned actions to mitigate damages by avoiding interference, disruption, hindrance, delay, or impact; and

8.1.3.6 recommended action to avoid or minimize any interference, disruption, hindrance, delay, or impact.

8.1.4 The Contractor's failure to initiate a Claim as and when required under this **Section 8.1** shall constitute the Contractor's irrevocable waiver of the Claim.

8.1.5 The A/E, in consultation with the Contracting Authority, shall respond to the written notice of the Claim within a reasonable time of receipt, but not to exceed ten days.

8.2 Substantiation of Claims

8.2.1 Within 30 days after the initiation of a Claim, the Contractor shall submit four copies of all information and statements required to substantiate a Claim as provided in this **Article 8** and all other information that the Contractor believes substantiates the Claim. The Contractor shall file the four copies by delivery of one copy to the A/E, one copy to the Owner, and two copies to the Contracting Authority.

8.2.2 The Contractor shall substantiate all of its Claims by providing the following minimum information:

8.2.2.1 a narrative of the circumstances, which gave rise to the Claim, including without limitation the start date of the event or events and the actual or anticipated finish date;

8.2.2.2 detailed identification of the Work (e.g., activity codes from the Construction Progress Schedule) affected by the event giving rise to the Claim;

8.2.2.3 copies of the Contractor's daily log (**Section 6.2.17**) for each day of impact;

8.2.2.4 copies of relevant correspondence and other information regarding or supporting Contractor entitlement;

8.2.2.5 copies of the Contractor's most recent income statement, including segregated general and administrative expenses for the most recent reporting period, and for the period of the Contract, if available, and similar information for any Subcontractor claim included; and

8.2.2.6 the notarized certification described under **Section 8.5.1.1**.

8.2.3 The Contractor's failure to comply with the requirements of this **Section 8.2** shall constitute an irrevocable waiver of any related Claim.

8.3 Substantiation of Claims for Increase of the Contract Sum

8.3.1 The Contractor shall substantiate each Claim for an increase of the Contract Sum with:

8.3.1.1 written documentation as described under **Section 7.7** of the actual additional direct and indirect costs to the Contractor due to the event giving rise to the Claim;

8.3.1.2 a written statement from the Contractor that the increase requested is the entire increase in the Contract Sum associated with the Claim; and

8.3.1.3 the general substantiation documentation described under **Section 8.2**.

8.3.2 The Contractor's failure to comply with the requirements of this **Section 8.3** shall constitute an irrevocable waiver of any related Claim.

8.4 Substantiation of Claims for Extension of the Contract Times

8.4.1 The Contractor shall substantiate each Claim for an extension of the Contract Times with:

8.4.1.1 written documentation as described under **Section 7.8** of the actual delay to the critical path of the Construction Progress Schedule due to the event giving rise to the Claim;

8.4.1.2 a detailed written Proposal as described under **Section 7.7** for an increase in the Contract Sum that would fully compensate the Contractor for all costs of acceleration of the Work needed to completely overcome the associated delay together with a statement consistent with **Section 8.3.1.2**;

8.4.1.3 a written statement from the Contractor that the extension requested is the entire extension of the Contract Times associated with the Claim; and

8.4.1.4 the general substantiating documentation described under **Section 8.2**.

8.4.2 In addition to the requirements of **Section 8.4.1**, if adverse weather conditions are the basis for a Claim for additional time, the Contractor shall document the Claim with data substantiating that weather conditions were abnormal for the period, could not have been reasonably anticipated, and had an adverse effect on a critical element of the scheduled construction. The support for and evaluation of all adverse weather Claims shall be based upon average weather conditions during the five years immediately preceding the dates at issue in the Claim as those weather conditions were recorded at the government-controlled weather-recording facility nearest to the Site.

8.4.3 The Contractor's failure to comply with the requirements of this **Section 8.4** shall constitute an irrevocable waiver of any related Claim.

8.5 Certification of the Claim

8.5.1 The Contractor shall certify each Claim within 30 days after initiating the Claim under **Section 8.1** or before Contract Completion, whichever is earlier, by providing the notarized certification specified in **Section 8.5.1.1**, signed and dated by the Contractor:

8.5.1.1 "The undersigned Contractor certifies that the Claim is made in good faith; that the supporting data is accurate and complete to the best of the Contractor's knowledge and belief; that the amount of money, time, or both requested is a fair, reasonable, and necessary adjustment for which the Contractor believes the State is liable; that the amount of money, time, or both requested is the entire amount of money, time, or both to which the Contractor is entitled on account of the Claim and for which the Contractor believes the State is liable; and that the undersigned is duly authorized to certify the Claim on behalf of the Contractor."

8.5.2 The date that the Contractor's certified and fully substantiated Claim is received by the Contracting Authority, or the date that the Contractor is required to certify and fully substantiate a Claim pursuant to **Sections 8.2.1** and **8.5.1**, shall trigger the 120-day period for exhaustion of administrative remedies pursuant to ORC Section 153.16(B).

8.5.3 The Contractor's failure to comply with the requirements of this **Section 8.5** shall constitute an irrevocable waiver of any related Claim.

8.6 Delay and Delay Damage Limitations; Derivative Claims

8.6.1 Subject to other provisions of the Contract, the Contractor will be entitled only to an extension of the Contract Times on account of delay in the commencement or progress of Work on the critical path of the Construction Progress Schedule caused by acts of Nature or the public enemy, acts of the government not arising from the Contractor's failure to comply with Applicable Law, fires, floods, epidemics, weather, and labor disputes beyond the Contractor's control.

8.6.2 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum, or an extension of the Contract Times, or both:

8.6.2.1 on account of the impact of any normal adverse weather on any of the Work or on account of the impact of any abnormal adverse weather on Work not on the critical path;

8.6.2.2 to the extent that a delay occurs concurrently with a delay attributable to the Contractor; or

8.6.2.3 on account of the delay of any Work not on the critical path.

8.6.3 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum or any type of damages on account of a delay in the commencement or progress of

Work on the critical path unless (1) the delay is caused by the Owner and (2) the delay was not authorized or permitted under the Contract.

8.6.4 Notwithstanding any other provision of the Contract Documents to the contrary, the Contractor shall not be entitled to an increase in the Contract Sum or any type of damages arising from a delay in the commencement or progress of any of the Work caused by the occurrence or non-occurrence of an event beyond the Owner's control such as acts of Nature or the public enemy, acts of the government, fires, floods, epidemics, labor disputes, unusual delivery delays, weather, or damages caused by the Contractor.

8.6.5 Derivative Claims. Notwithstanding any other provision of the Contract to the contrary, if the Owner prosecutes a claim, suit, or appeal against a Separate Consultant or Separate Contractor to recover damages the Contractor suffers on account of the acts or neglects of a Separate Consultant or Separate Contractor or a person or entity for whom either is legally responsible, the Owner's liability to the Contractor shall not exceed the amount the Owner actually recovers from the Separate Consultant or Separate Contractor on account of those damages less the costs the Owner incurs recovering them. The Owner is not obligated to prosecute any such claim, suit, or appeal.

8.7 Liquidated Damages

8.7.1 If the Contractor fails to achieve a Milestone within the associated Contract Time, it would be difficult, if not impossible, to determine the Owner's resulting damages. Therefore, if the Contractor fails to achieve a Milestone within the associated Contract Time, the Contractor shall (at the Owner's option) pay to or credit the Owner the Liquidated Damages per day sum determined according to the following schedule for each day that the Contractor fails to achieve a Milestone within the associated Contract Time. If the Project involves more than one Phase as explicitly identified in the Agreement, the Contract Sum in the below schedule refers to the total Contract Sum for each of the Phases individually as opposed to the aggregate Contract Sum for all Phases.

Contract Sum	Liquidated Damages per day for Milestones other than the Punch List Milestone	Liquidated Damages per day for the Punch List Milestone
Less than \$1,000,000	\$500	\$125
From \$1,000,000.01 to \$2,000,000	\$1,000	\$250
From \$2,000,000.01 to \$5,000,000	\$2,000	\$500
From \$5,000,000.01 to \$10,000,000	\$5,000	\$1,250
From \$10,000,000.01 to \$20,000,000	\$7,500	\$1,875
From \$20,000,000.01 to \$50,000,000	\$10,000	\$2,500
More than \$50,000,000	\$15,000	\$3,750

8.7.2 If the Contractor simultaneously fails to achieve two or more Milestones, the Owner shall be entitled to recover the sum of the associated Liquidated Damages per day rates.

8.7.3 The Liquidated Damages described in this **Section 8.7** are only intended to compensate the Owner for the direct damages it incurs as a result of the Contractor's failure to achieve the Milestones within their associated Contract Times.

8.7.4 The Liquidated Damages described in this **Section 8.7** are not intended to compensate the Owner for any damages the Owner incurs on account of (1) any claims attributable to the Contractor that are brought by others including Separate Consultants and Separate Contractors or (2) any failure of the Contractor to timely, properly, and completely perform the Contract other than the failure to achieve the Milestones within their associated Contract Times.

8.7.5 The parties acknowledge that the above-listed Liquidated Damages per day sums are not penalties, and they each irrevocably waive the right (if any) to challenge the validity and enforceability of those Liquidated Damages per day sums. Notwithstanding any other provision of the Contract Documents to the contrary, if a court determines that the Liquidated Damages per day sums or their application are void and unenforceable, the Owner shall be entitled to recover the actual damages that it incurs on account of the Contractor's failure to achieve one or more of the Milestones within the Contract Times.

8.7.6 In addition to other rights that the Owner may have relative to the Liquidated Damages, the Contracting Authority may deduct the Liquidated Damages from the Contract Sum as the damages accrue. If payments then or thereafter due the Contractor are not sufficient to cover such amounts, the Contractor shall immediately pay the amount of the insufficiency to the Owner.

8.8 Mutual Waiver of Consequential Damages

8.8.1 Except as provided under **Section 8.8.2**, the Owner and Contractor each waive against the other all Claims for consequential damages that may arise out of or relate to this Contract.

8.8.1.1 The Owner's waiver includes Claims for loss of use, income, profit, revenue, financing, cost of capital, business and reputation, management and employee productivity, and consequential damages arising from termination of the Contract or related to insolvency.

8.8.1.2 The Contractor's waiver includes Claims for unabsorbed home-office overhead; any other form of overhead in excess of that specifically provided for under **Section 7.7**; delay damages except as otherwise specifically provided for in **Section 8.6**; increased cost of funds for the Project; lost opportunity to work on other projects; losses of financing, business, and reputation; loss of profit except anticipated profit arising directly from properly performed Work; loss of bonding capacity; and consequential damages arising from termination of the Contract or related to insolvency.

8.8.2 Notwithstanding **Section 8.8.1**, this **Section 8.8**:

8.8.2.1 does not apply to any damages that would be covered by insurance provided in connection with the Project if the Contract did not include **Section 8.8.1**;

8.8.2.2 does not apply to the Contractor's indemnity obligations for third-party claims against the Indemnified Parties even if those claims are for damages that **Section 8.8.1** would otherwise preclude;

8.8.2.3 does not preclude the Owner's recovery of Liquidated Damages under **Section 8.7**; and

8.8.2.4 does not apply to Claims for damages arising from the Owner's or the Contractor's gross negligence or willful misconduct.

8.8.3 This **Section 8.8** shall survive termination of the Contract.

8.9 Review of the Claim

8.9.1 The A/E shall review the Claim and prepare a written analysis of its content, which shall include:

8.9.1.1 a narrative of the A/E's examination of the facts giving rise to the Claim;

8.9.1.2 identification of relevant Contract Documents and language;

8.9.1.3 an analysis of whether the Contractor complied with the requirements of the Contract Documents pertaining to Claim initiation and substantiation including, without limitation, the issues of entitlement to, and calculation of, adjustments of the Contract Sum, Contract Times, or both;

8.9.1.4 an analysis of claimed additional labor, materials, and equipment for the scope of the Work items described;

8.9.1.5 an analysis of any time extension for any interference, disruption, hindrance, impact, or delay claimed (to include the calculation of any concurrent delays affecting entitlement);

8.9.1.6 a concluding opinion regarding Contractor entitlement to, and the appropriateness and reasonableness of all, or any part of, the Claim; and

8.9.1.7 an appendix containing copies of contemporaneous documentation supporting the concluding opinion.

8.9.2 The A/E shall submit the written analysis to the Project Manager no more than 30 days after receiving the Contractor's substantiated and certified Claim.

8.10 Claim Decision

8.10.1 The Project Manager shall examine the Contractor's Claim and A/E's analysis.

8.10.2 The Project Manager shall approve or deny all, or any part, of the Contractor's Claim and forward a written decision to the Contractor, A/E, Owner, and Contracting Authority within 14 days after receiving the A/E's analysis. The Project Manager may employ independent resources to assist in its review, or refer evaluation of the Claim to a consultant.

8.10.3 If the Contractor and Owner agree with the Project Manager's decision, the decision shall be incorporated into a Change Order.

8.10.4 Any Claim remaining unresolved after completion of the process described under this **Section 8.10** shall be subject to Claim decision review as described under **Section 8.11**.

8.11 Claim Decision Review

8.11.1 The Contractor may request review of the Project Manager's decision by written notice delivered by certified mail within 14 days after the Project Manager's decision.

8.11.1.1 If the Project is administered by the Commission, jointly administered by the Commission and a public school district, or locally administered by authority granted to an agency of the state of Ohio by the Commission, the written notice shall be delivered to the Executive Director of the Commission.

8.11.1.2 If the Project is locally administered by an Institution of Higher Education under ORC Section 3345.50 or ORC Section 3345.51, the written notice shall be delivered to the Institutional Designee who will review the Project Manager's decision instead of the Commission.

8.11.2 The Commission or Institutional Designee, as applicable, shall schedule and conduct a meeting within 30 days after receiving the Contractor's request for review. The Commission or Institutional Designee may employ independent resources to assist in the meeting and review.

8.11.3 The Commission or Institutional Designee, as applicable, shall determine the final disposition of the Contractor's request for review and provide a written decision to the Contractor and Owner within 14 days after the meeting.

8.11.4 The decision of the Commission or Institutional Designee is the final administrative decision of the Contracting Authority as described under ORC Section 153.12(B).

8.11.5 If the Contractor and Owner agree with the Commission's or the Institutional Designee's decision, the decision shall be incorporated into a Change Order.

8.11.6 Any Claim remaining unresolved after completion of the process described under this **Section 8.11** shall be subject to litigation, which may be preceded by Alternative Dispute Resolution ("ADR") as described under **Section 8.13**.

8.12 Delegation

8.12.1 No provision of this **Article 8** shall prevent the Executive Director from delegating the duties or authorities of the Commission to any other person selected at the Executive Director's sole discretion.

8.13 Alternative Dispute Resolution

8.13.1 At any point in the Claims and dispute-resolution processes, the Project's key stakeholders may agree to enter into non-binding ADR including progressive negotiation, Dispute Review Board, mediation, or another non-binding ADR procedure accepted by all of the Project's key stakeholders.

8.14 Audit of the Claim

8.14.1 All Claims shall be subject to audit at any time following filing of the Claim, whether or not the Claim is part of a lawsuit.

8.14.2 The audit may be performed by employees of the Contracting Authority or by a consultant engaged by the Contracting Authority.

8.14.3 The audit may begin upon ten-days' notice to the affected Contractor or affected Subcontractor.

8.14.4 The Contractor shall cooperate with the request.

8.14.5 Failure of the Contractor or Subcontractor to produce sufficient records to allow the Contracting Authority to audit and verify a Claim shall constitute an irrevocable waiver of the Claim or portion of the Claim that could not be completely audited.

8.14.6 The Contractor shall make available to the Contracting Authority all Contractor and Subcontractor documents related to the Claim including, without limitation, the following documents:

8.14.6.1 daily time sheets and superintendent's daily reports;

8.14.6.2 union agreements, if any, and employer agreements;

8.14.6.3 insurance, welfare, fringes, and benefits records;

8.14.6.4 payroll register;

8.14.6.5 earnings records;

8.14.6.6 payroll tax returns;

- 8.14.6.7 material invoices, purchase orders, Subcontracts, and all material and supply acquisition contracts;
- 8.14.6.8 material cost distribution worksheets;
- 8.14.6.9 equipment records (list of Contractor equipment, rates, etc.);
- 8.14.6.10 vendor rental agreements and Subcontractor invoices;
- 8.14.6.11 Subcontractor payment certificates;
- 8.14.6.12 canceled checks (payroll and vendors);
- 8.14.6.13 job cost report;
- 8.14.6.14 job payroll ledger;
- 8.14.6.15 general ledger, general journal (if used), and all subsidiary ledgers and journals together with all supporting documentation pertinent to entries made in those ledgers and journals;
- 8.14.6.16 cash disbursements journal;
- 8.14.6.17 financial statements for all years reflecting operations on the Project;
- 8.14.6.18 income tax returns for all years reflecting operations on the Project;
- 8.14.6.19 depreciation records on all equipment utilized whether the records are maintained by the Contractor, its accountant, or others;
- 8.14.6.20 if a source other than depreciation records is used to develop costs for the Contractor's internal purposes in establishing the actual cost of owning and operating equipment, all other source documents;
- 8.14.6.21 all documents that reflect the Contractor's actual profit and overhead during the years the Project was being performed;
- 8.14.6.22 all documents related to the preparation of the Contractor's Bid(s), including the final calculations on which the Bid was based, unless the documents are placed in escrow under provisions of the Instructions to Bidders;
- 8.14.6.23 all documents that relate to the Claim together with all documents that support the amount of damages as to the Claim;
- 8.14.6.24 worksheets used to prepare the Claim establishing the cost components for items of the Claim including, but not limited to, labor, fringes, benefits and insurance, materials, equipment, Subcontractors, and all documents that establish the periods of time, individuals involved, the hours and rate of pay for the individuals; and
- 8.14.6.25 all other documents required by the Contracting Authority to reasonably review the Claim.

8.15 False Certification of the Claim

8.15.1 If the Contractor falsely certifies all or any part of a Claim, the portion of the Claim falsely certified shall be denied, and may be sufficient cause for the State to debar the Contractor from future State contracting opportunities as permitted by Applicable Law.

8.16 Performance and Payment

8.16.1 The Contractor shall proceed with the Work during any dispute resolution process, unless otherwise agreed by the Contractor and Contracting Authority in writing.

8.16.2 The Contracting Authority shall continue to make payment of any undisputed amounts in accordance with the Contract Documents pending final resolution of a Claim, unless otherwise agreed by the Contractor and Contracting Authority in writing.

ARTICLE 9 - COMPENSATION AND PAYMENT

9.1 Allowances

9.1.1 The Contract Sum includes the Allowances (if any) identified in the Contract.

9.1.2 All Allowances include the cost to the Contractor (less any applicable trade discounts) of materials and equipment required by the Allowances to be delivered at the Site, and all applicable taxes.

9.1.3 The Contractor's Fee and costs for unloading and handling on the Site, labor, installation costs, and other expenses contemplated for the Allowances are not in the stated Allowance amounts but are otherwise included in the Contract Sum.

9.1.4 Before final payment, an appropriate Change Order will be issued to reconcile the Contract Sum so that it reflects actual amounts due to the Contractor on account of Work covered by Allowances.

9.2 Unit Prices

9.2.1 Where the Contract provides that all or part of the Work is to be Unit Price Work, initially the Contract Sum will include for all Unit Price Work **(1)** an amount equal to the sum of the established Unit Prices for each separately identified item of Unit Price Work times the estimated quantity of each item as indicated in the Contract plus **(2)** the Contractor's Fee on that Unit Price Work.

9.2.2 The estimated quantities of items of Unit Price Work are not guaranteed and are solely for the purpose of comparison of Bids and determining an initial Contract Sum. The Contracting Authority will determine the actual quantities and classifications of Unit Price Work performed by Contractor.

9.2.3 The Contractor's Fee on account of Unit Price Work is not in the stated Unit Price amounts but are otherwise included in the Contract Sum.

9.2.4 Before final payment, an appropriate Change Order will be issued as described under **Section 7.1.5** to reconcile the Contract Sum so that it reflects actual amounts due to the Contractor on account of Unit Price Work actually performed.

9.3 Schedule of Values

9.3.1 Within ten days after receipt of the Notice to Proceed, or other period as mutually agreed by the Contractor and Contracting Authority, the Contractor shall submit to the A/E a Schedule of Values on a form published by the Commission, with separate amounts shown for labor and materials for each branch of Work, following the numbers and titles of the Construction Specifications Institute's *MasterFormat* for individual work results, or *UniFormat* for assemblies in place.

9.3.1.1 The Contractor shall clearly indicate on the Schedule of Values, the amount(s) allocated, including separate items for Contractor's Fee (overhead and profit), for each EDGE-certified Business used in the performance of the Work. The amount(s) shall indicate labor and materials, as appropriate.

9.3.2 The grand total shown on the Schedule of Values shall equal the total Contract Sum. The Contracting Authority may use the approved Schedule of Values to determine the cost or credit to the Owner resulting from any change in the Work.

9.3.2.1 The first items shall be a breakdown of General Conditions Costs.

9.3.2.2 The amounts for labor and materials shall accurately reflect the cost for each item. Separate items shall not be shown for Contractor's Fee, except when Work is performed or materials are supplied by an EDGE-certified Business, pursuant to **Section 9.3.1.1**. Contractor's Fee shall be included in the totals for labor and materials.

9.3.2.3 If the material allocation exceeds 55 percent of the Contract Sum, the Contractor shall provide, upon request, sufficient information to support the higher percentage.

9.3.2.4 Subcontract Work shall show amounts for labor and materials. Fringe benefits shall be shown as a part of labor costs.

9.3.2.5 When more than one major structure is included in the Work, the Contractor shall subdivide the Schedule of Values accordingly, with cost details for each structure shown separately.

9.3.2.6 The line items shall be coordinated with line items in the Project Schedule, which may require division of items of Work by area of the Project by floor, phase, or other appropriate area.

9.3.2.7 Mechanical and electrical Work shall be included in separate line items for all major pieces of equipment, and group smaller equipment items by type.

9.3.2.8 Line items shall be included for each Allowance, Coordination Drawings, Punch List Work, Project Record Document Submittals, delivery of attic stock, and specified demonstrations and training.

9.3.3 The A/E may return the Schedule of Values to the Contractor for re-submittal if it does not meet the requirements or contains insufficient items or details of the Work, or approve the Schedule of Values if the A/E determines that it conforms to this **Section 9.3**.

9.3.4 No payment shall be made until the A/E has approved the Contractor's Schedule of Values.

9.4 Contractor Payment Request

9.4.1 The Contractor may submit a Contractor Payment Request for Work performed based upon the Schedule of Values to the A/E each month or upon another interval approved by the Contracting Authority. When the rate of Work and amount involved is sufficient that it is considered appropriate by the Contracting Authority, the Contractor may submit Contractor Payment Requests twice a month.

9.4.1.1 The Contractor shall support each Contractor Payment Request with documentation substantiating the Contractor's right to payment. The Contractor shall supply additional documentation as the A/E may request in connection with each payment to the Contractor.

9.4.1.2 The Contracting Authority may require proof of the renewal of required insurance as a condition precedent to payment.

9.4.1.3 The Contractor shall attach certified payroll reports for the relevant period to one copy of each Contractor Payment Request, see **Document 00 73 43 - Prevailing Wage Requirements**.

9.4.1.4 The Contractor may list on the Contractor Payment Request any Change Orders approved and performed prior to submission of the Contractor Payment Request.

9.4.1.5 The Contractor shall submit its Contractor Payment Request using the Contractor Payment Request form or forms current at the time of each application and as provided by the Contracting Authority in the manner prescribed by the Contracting Authority.

9.4.1.6 The Contractor shall submit one draft copy of its Contractor Payment Request ("Pencil Copy") to the A/E not less than one week prior to submitting multiple copies of its Contractor Payment Request. The A/E shall review the Pencil Copy and provide comments to the Contractor within three days after receiving it. The Contractor shall incorporate the A/E's comments into its Contractor Payment Request prior to submitting multiple copies for payment.

9.4.1.7 The Contractor shall clearly indicate on the Contractor Payment Request, the amount(s) requested for each EDGE-certified Business used in the performance of the Contract. The amount(s) shall indicate labor and materials, as appropriate.

9.4.1.8 The Contractor shall submit an electronic copy of the Contractor Payment Request to the A/E with its paper copies of the Contractor Payment Request for collection and reporting of information used for contract compliance evaluation and statistical purposes. The Contractor may issue the copy in any electronic media acceptable to the Contracting Authority.

9.4.2 Payments for Unit Price Work shall be made to the Contractor only for the authorized actual quantities of Work performed or materials furnished in accordance with the Contract Documents.

9.4.3 Subject to **Section 9.8**, the Owner shall pay an approved Contractor Payment Request within 30 days after the date the A/E recommends acceptance of the Contractor Payment Request.

9.4.4 Notwithstanding any other provision of the Contract Documents, partial payments made pursuant to this **Section 9.4** constitutes neither acceptance of any Defective Work, nor a waiver of any rights set forth in the Contract Documents or otherwise provided by Applicable Law.

9.4.5 The Contracting Authority and Owner may audit Contractor Payment Requests as described under **Section 7.9**.

9.5 Labor Payments

9.5.1 Partial payments to the Contractor for labor shall be made at the rate of 92 percent of the amount invoiced through the Contractor Payment Request that shows the Work is 50 percent complete.

9.5.2 After the Work is 50 percent complete, as evidenced by payments of at least 50 percent of the Contract Sum including approved Change Orders to date, no additional funds shall be retained from payments for labor.

9.5.3 If the Project involves more than one Phase as explicitly identified in the Agreement, this **Section 9.5** will apply on a per-Phase basis.

9.6 Material Payments

9.6.1 The Owner shall pay the Contractor at the rate of 100 percent of the scheduled value for materials incorporated into the Project.

9.6.2 The Owner shall pay the Contractor at the rate of 92 percent of the invoice cost, not to exceed the scheduled value in a Unit Price or lump sum Contract, for materials delivered to the Site, or other off-site storage location approved by the A/E, provided the Contractor provides the following information with the Contractor Payment Request:

9.6.2.1 a list of the fabricated materials consigned to the Project, giving the place of storage, together with copies of invoices verifying quantity and cost, written evidence of insurance covering the off-site stored materials; and

9.6.2.2 a certification of materials stored off-site, prepared by the Contractor and signed by the A/E to evidence that the materials are in conformity with the Specifications and have been tagged with the Project name and number for delivery to the Project. The Contractor shall directly reimburse the A/E for all costs incurred to visit a storage site, other than the areas adjacent to the Project.

9.6.2.3 The Owner shall pay the balance of the scheduled value when the materials are incorporated into and become a part of the Project.

9.6.3 When payment is allowed for materials delivered to the Site or other approved off-site storage location but not yet incorporated into the Project, the materials are the property of the Owner.

9.6.3.1 The Owner may, at its sole discretion, retain any material not ultimately incorporated into the Project or return it to the Contractor for credit of an amount proportionate to the value of the extra materials.

9.7 Retainage

9.7.1 If the total Contract Sum is \$15,000 or more, when the Contract is 50 percent complete, all funds retained for faithful performance of the Work, in accordance with **Section 9.5.1**, shall be deposited in an escrow account with a bank in the state in accordance with the terms and conditions provided in an escrow agreement executed by the Contractor, Contracting Authority, and applicable bank.

9.7.2 When the Contractor has achieved Substantial Completion of all Work, and there is no other reason to retain funds; upon request of the Contractor, the funds retained in connection with that Work shall be released from escrow and paid to the Contractor, withholding only that amount necessary to assure faithful completion in the sole discretion of the Contracting Authority, including but not limited to compliance with **Section 6.25.2**.

9.7.3 Upon consent by the Contractor's Surety, the Contracting Authority may reduce the amount of funds retained for the faithful performance of Work by 50 percent of the amount of funds required to be retained, provided the Contractor's Surety remains responsible for all damages that may be caused due to default by the Contractor, including, but not limited to, the following:

9.7.3.1 completion of the Work;

9.7.3.2 all interference, disruption, hindrance, and delay claims;

9.7.3.3 all Liquidated Damages; and

9.7.3.4 all additional expenses incurred by the State.

9.7.4 If the Project involves more than one Phase as explicitly identified in the Agreement, this **Section 9.7** will apply on a per-Phase basis.

9.8 Payments Withheld

9.8.1 The A/E may recommend to the Contracting Authority that payments be withheld from, or Liquidated Damages be assessed against, a Contractor Payment Request.

9.8.2 The Contracting Authority may decline to approve any Contractor Payment Request or part thereof, or nullify any previous Contractor Payment Request, in whole or in part, to the extent necessary in the Contracting Authority's sole opinion to protect the Owner from loss because of:

9.8.2.1 Defective Work not remedied;

9.8.2.2 damage caused by the Contractor;

9.8.2.3 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;

9.8.2.4 reasonable evidence that the Work will not be completed within the Contract Times, and that the unpaid balance would not be adequate to cover damages under the Contract Documents for the anticipated delay;

9.8.2.5 failure to comply with Applicable Law including, but not limited to, the requirements of ORC Chapter 4115;

9.8.2.6 failure to timely submit EDGE Participation Reports in accordance with **Section 1.8.2**;

9.8.2.7 failure to timely identify the Contractor's proposed Subcontractors in accordance with **Section 4.1.1**;

9.8.2.8 failure to timely fulfill the Contractor's obligations related to the Construction Progress Schedule;

9.8.2.9 failure to carry out the Work in accordance with the Contract Documents; or

9.8.2.10 that which is permitted under other provisions of the Contract Documents.

9.8.3 If the Contractor remedies the basis for withholding payment under **Section 9.8.2** to the Contracting Authority's satisfaction, the Owner shall pay the amounts withheld.

9.9 Final Contractor Payment Request

9.9.1 The Contractor, as a condition precedent to execution of the Certificate of Contract Completion and to final payment, shall complete all requirements of the Contract Documents.

9.9.1.1 The Contractor and each of its Subcontractors, regardless of tier, shall execute a Payment Release Affidavit to certify that the Contractor and each of its Subcontractors, regardless of tier, have complied with all requirements of ORC Chapter 4115, and to certify that all of its Subcontractors have been paid in full for all Work performed or materials furnished for the Project.

9.9.2 The Owner shall pay the final Contractor Payment Request within 30 days after the date the A/E recommends acceptance of the final Contractor Payment Request.

9.9.3 Acceptance of final payment by the Contractor or a Subcontractor constitutes the payee's waiver of all claims against the State except those previously made in writing under **Article 8** and identified by that payee as unsettled at the time of the final Contractor Payment Request.

ARTICLE 10 - BONDS, INSURANCE, AND INDEMNIFICATION

10.1 Payment and Performance Bonds

10.1.1 Before signing the Agreement, the Contractor shall provide the Bond required under Applicable Law and below:

10.1.1.1 If the Contractor provided **Document 00 43 13 - Bid Security Form** as its Bid Guaranty, then that form shall be the Bond.

10.1.1.2 If the Contractor provided another form of Bid Guaranty, then **Document 00 61 13 - Performance and Payment Bond Form** shall be the Bond.

10.1.1.3 Each Surety under the Bond shall be licensed to do business in Ohio and satisfactory to the Contracting Authority.

10.1.1.4 If there is more than one Surety under the Bond, each of them shall be jointly and severally liable as surety under the Bond.

10.1.1.5 Unless the Contracting Authority and the Owner are the same entity, the Bond shall name as co-obligees **(1)** the State by and through the Contracting Authority and **(2)** the Owner.

.1 If any document is used to name the required co-obligees of the Bond (e.g., a form commonly known as a "dual obligee rider"), that document will not alter the terms of the Contract in any way or the terms of the Bond in any way beyond merely naming the co-obligees notwithstanding any term of that document to the contrary.

.2 The Surety will not be obligated to more than the Penal Sum of any Bond solely on account of the existence of more than one obligee under that Bond.

10.1.1.6 The penal sum of the Bond, when initially submitted, shall be equal to one-hundred percent of the Contract Sum.

10.1.2 The Contractor shall submit with the executed Bond **(1)** a certified copy of the authority to act (power of attorney) of the agent signing the Bond on behalf of the Surety and **(2)** a current and signed Certificate of Compliance under ORC Section 9.311 issued by the Ohio Department of Insurance showing the Surety is licensed to do business in Ohio.

10.1.3 If the Contract Sum increases at any time such that it exceeds the penal sum of the Bond, the Contractor shall cause the penal sum of the Bond to be increased such that the penal sum equals one-hundred percent of the increased Contract Sum.

10.1.4 Any time the Contractor increases the penal sum of the Bond under **Section 10.1.3**, the Contractor shall deliver to the Contracting Authority an Acknowledgment of Surety from the affected Surety or Sureties to evidence the Surety's or Sureties' receipt of notice of the increased penal sum.

10.1.4.1 The Contracting Authority's receipt of the required Acknowledgement(s) of Surety is a condition precedent to the Owner's obligation to pay the Contractor for any portion of the Work associated with the increase of the penal sum.

10.1.4.2 The Contractor's failure to submit a required Acknowledgment of Surety or a Surety's failure or refusal to provide an Acknowledgment of Surety will not relieve the Surety of its obligation for the increased penal sum.

10.1.4.3 If any Surety fails or refuses to provide a required Acknowledgement of Surety, the Contracting Authority may require the Contractor to deliver to the Contracting Authority a new Bond showing the increased penal sum and written consent of the affected Surety or Sureties confirming the increased penal sum. In that event, the Contracting Authority's receipt of replacement Bonds will be a condition precedent to the Owner's obligation to pay the Contractor for any portion of the Work associated with the increase of the penal sum.

10.1.4.4 Each Acknowledgment of Surety shall be **(1)** on a form provided by the Contracting Authority and **(2)** subject to the acceptance of the Contracting Authority.

10.1.5 If at any time prior to final payment, any surety providing a Bond for the Project **(1)** is adjudged bankrupt or has made a general assignment for the benefit of its creditors; **(2)** has liquidated all assets or has made a general assignment for the benefit of its creditors; **(3)** is placed in receivership; **(4)** otherwise petitions a state or federal court for protection from its creditors; or **(5)** allows its license to do business in Ohio to lapse or to be revoked, then the Contractor shall, within 21 days after any such action listed above, provide the Contracting Authority with a new Bond in the form and amount described in this **Section 10.1**. The Contracting Authority's receipt of a replacement Bond is a condition precedent to the Owner's obligation to pay the Contractor.

10.1.6 If notice of any change affecting the Contract is required by any Surety or by the provision of any Bond, the Contractor shall provide that notice.

10.2 Contractor's General Insurance Requirements

10.2.1 Throughout the performance of the Work or longer as may be described below, the Contractor shall obtain, pay for, and keep in force, the minimum insurance coverage described in this **Article 10**.

10.2.1.1 Each requirement of this **Article 10** applies to Subcontractors just as it applies to the Contractor.

10.2.1.2 If a Subcontractor's usual insurance coverage does not meet the minimum coverage requirements, before entering into an agreement with that Subcontractor, the Contractor shall submit to the Contracting Authority **(1)** a certificate of insurance evidencing the insurance the Subcontractor will carry without additional compensation and **(2)** if the Contracting Authority requests, a written proposal from the Subcontractor to provide coverage that meets the minimum coverage requirements. The Contracting Authority will decide whether to accept the non-conforming insurance coverage or the proposal to provide conforming coverage.

.1 Notwithstanding any other provision of the Contract to the contrary, the Contractor will not be entitled to any increase of the Contract Sum, Contract Times, or both on account of the Contracting Authority's refusal to accept a Subcontractor's nonconforming insurance coverage.

10.2.1.3 On a case-by-case basis, the Contracting Authority and Contractor may agree to adjust the below requirements for any particular Subcontractor.

10.2.2 Before starting the Work on the Site, upon renewal of any policy, and upon a change of any insurance carrier, the Contractor shall deliver to the Contracting Authority certificates evidencing that the required insurance is in force.

10.2.2.1 Certificates of insurance for other than government-controlled workers' compensation insurance shall identify **(1)** all below-required additional insureds and **(2)** the Project name.

10.2.3 With the exception of government-controlled workers' compensation coverage:

10.2.3.1 the Contractor shall place the insurance with companies that **(1)** are satisfactory to the Contracting Authority, **(2)** hold an A.M. Best Rating of A-, X, or higher, and **(3)** are authorized to conduct business in Ohio;

10.2.3.2 the policies shall be endorsed to require the Contractor's insurance carrier to **(1)** provide 30-days' written notice to the Contracting Authority (as certificate holder) of the cancellation or non-renewal of the insurance and **(2)** provide at least ten-days' written notice to the Contracting Authority (as certificate holder) of the cancellation of the insurance for non-payment of premium; and

10.2.3.3 within 30 days after the Contracting Authority's request, the Contractor shall submit insurance-company certified copies of the policies, the policy endorsements, loss-run reports, or all three.

10.2.4 The Contractor shall pay all deductibles, or self-insured retentions, or both contained in the Contractor's policies of insurance required or provided in connection with the Project. The Contracting Authority reserves the right to approve

or reject all levels of self-insured retention, captive insurance programs, or other alternative risk financing the Contractor may use to comply with any insurance requirement.

10.2.5 The Contractor shall pay a proportionate share of the deductibles, or self-insured retentions, or both contained in any insurance policy the Contracting Authority purchases for the Project. The Contractor's proportionate share will derive from the percentage of the associated claim or loss attributable to the alleged or actual negligence of the Contractor or a Subcontractor.

10.2.6 The Contracting Authority and Owner do not represent that required coverage or limits are adequate to protect the Contractor.

10.2.7 Failure of the Contracting Authority to demand a certificate or other evidence of full compliance with the insurance requirements or failure of the Contracting Authority to identify a deficiency from evidence that is provided shall not be construed as a waiver of the Contractor's obligation to maintain the required insurance.

10.2.8 The Contracting Authority may terminate the Contract for cause on account of the Contractor's failure to maintain required insurance.

10.3 Contractor's Minimum Coverage Requirements

10.3.1 Workers Compensation. The Contractor shall maintain workers' compensation coverage meeting the requirements of Applicable Law including, without limitation, the Jones Act and the Longshore & Harbor Workers Compensation Act if Work involves hazards arising from work on or near navigable waterways, including vessels and docks.

10.3.2 Employers' Liability Coverage. The Contractor shall maintain employers' liability coverage with (1) an each-accident limit of not less than \$1,000,000, (2) a disease each-employee limit of not less than \$1,000,000, and (3) a disease policy limit of not less than \$1,000,000.

10.3.3 Commercial General Liability. The Contractor shall maintain commercial general liability ("CGL") coverage that provides (1) an each-occurrence limit of not less than \$1,000,000, (2) a general-aggregate limit of not less than \$2,000,000, and (3) a products and completed-operations aggregate limit of not less than \$2,000,000.

10.3.3.1 The CGL insurance shall be written on ISO occurrence form CG 00 01 04 13 or a substitute form, providing at least equivalent coverage for liability arising from premises, operations, independent contractors, products/completed-operations, personal and advertising injury, and liability assumed under an insured contract.

10.3.3.2 The Contractor shall include the State, Contracting Authority, Owner, and A/E as additional insureds under the CGL policy using ISO endorsement CG 20 10 07 04 and ISO endorsement CG 20 37 07 04 or a substitute form(s) providing equivalent coverage.

10.3.3.3 The CGL policy shall be endorsed using ISO endorsement CG 25 03 or a substitute form providing equivalent coverage to provide that the general aggregate limit applies separately to each of the insured's projects.

10.3.3.4 The CGL policy shall not exclude coverage for property damage to the Work arising out of the products/completed-operations hazard where a Subcontractor performed the damaged Work or the Work out of which the damage arises.

10.3.3.5 The CGL insurance shall not exclude coverage for property damage to electronic data.

10.3.3.6 The CGL insurance shall apply as primary and non-contributory insurance with respect to any other insurance or self-insurance programs that cover the additional insured(s).

10.3.3.7 The CGL policy shall not exclude coverage to the additional insured(s) for bodily injury or property damage arising out of the products/completed-operations hazard.

10.3.3.8 The Contractor shall maintain the CGL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.4 Business Automobile Liability. The Contractor shall maintain business automobile ("BA") coverage written on ISO form CA 00 01 04 13 or a substitute form, providing at least equivalent coverage with a limit of not less than \$1,000,000 each accident.

10.3.4.1 The coverage shall extend to any auto (owned, not owned, leased, rented, hired, or borrowed).

10.3.4.2 The Contractor shall include the State, Contracting Authority, Owner, and A/E as additional insureds under the BA policy.

10.3.4.3 The BA policy shall include an MCS-90 endorsement if transporting hazardous wastes/materials.

10.3.5 Umbrella/Excess Liability. The Contractor may employ an umbrella/excess liability policy to achieve the above-required minimum coverage.

10.3.5.1 The Contractor shall maintain umbrella/excess liability coverage with a limit of not less than \$2,000,000 (in addition to the above-required limits) if the Work (or the Work to be performed by the Subcontractor) includes any of the following:

- .1 brick/block masonry;
- .2 exterior caulking/sealant;
- .3 cast-in-place or precast concrete;
- .4 curtain wall;
- .5 dampproofing/waterproofing;
- .6 electrical;
- .7 elevator;
- .8 exterior glass and/or glazing;
- .9 exterior marble, granite, and/or other stonework;
- .10 miscellaneous metals;
- .11 plaster/stucco;
- .12 plumbing;
- .13 HVAC;
- .14 roofing and/or sheet metal;
- .15 scaffolding;
- .16 spray-on fireproofing;
- .17 sprinkler and/or fire protection; or
- .18 structural steel and/or metal deck.

10.3.5.2 The Contractor shall maintain umbrella/excess liability coverage with a limit of not less than \$5,000,000 (in addition to the above-required limits) if the Work (or the Work to be performed by the Subcontractor) includes any of the following:

- .1 caissons and/or piles;
- .2 demolition;
- .3 excavation and/or utility work;
- .4 sheeting, shoring, and/or underpinning;
- .5 window washing equipment; or
- .6 wrecking.

10.3.6 Contractor's Pollution Liability. If the Work includes environmentally sensitive, hazardous types of activities (such as demolition, exterior insulation finish systems, Asbestos abatement, storage-tank removal, or similar activities), or involves Hazardous Materials, the Contractor shall maintain a contractor's pollution liability ("CPL") policy with **(1)** a per-claim limit of not less than \$1,000,000 and **(2)** an annual-aggregate limit of not less than \$1,000,000, covering the acts, errors and/or omissions of the Contractor for damages (including from mold) sustained by the Owner by reason of the Contractor's performance of the Work.

10.3.6.1 The CPL policy shall have an effective date, which is on or before the date that the Contractor first started to perform any Project-related services.

10.3.6.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the CPL policy's limits.

10.3.6.3 The Contractor shall maintain the CPL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.7 Professional Liability—Contractor. The Contractor shall maintain contractor's professional liability ("PL") insurance (including without limitation for sprinkler and/or fire protection and other design-build work included in the Work, and services related to coordination and scheduling of construction activities, and means and methods) without design-build exclusions with limits not less than as identified in the following table:

Contract Sum	Each Claim	Annual Aggregate
Up to \$50,000,000	\$1,000,000	\$2,000,000

Contract Sum	Each Claim	Annual Aggregate
More than \$50,000,000	\$2,000,000	\$4,000,000

10.3.7.1 The PL policy shall have an effective date on or before the date that the Contractor first started to provide any Project-related services.

10.3.7.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the PL policy's limits.

10.3.7.3 The Contractor shall maintain the PL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.7.4 If the Contractor is authorized under Applicable Law to directly provide professional design services, the Contractor may satisfy the requirements of this **Section 10.3.7** by providing a professional liability insurance policy.

10.3.7.5 If the Contractor is a joint venture:

- .1** the Contractor may meet the requirements of this **Section 10.3.7** by providing a PL policy under which each joint venturer is the insured; or
- .2** each joint venturer shall individually meet the requirements of this **Section 10.3.7** by providing a PL policy **(1)** under which the individual joint venturer is the insured and **(2)** that covers that joint venturer's interests in the joint venture by endorsement or otherwise. The certificate of insurance shall reflect that the PL policy covers the joint venturer's interest in the joint venture.

Example: Assume that the Contractor **(1)** is the "XY joint venture" of company "X" and company "Y"; and **(2)** is required under **Section 10.3.7** to maintain PL insurance limits of \$1M/\$2M. In order to comply with **Section 10.3.7.5.2**, "X" must maintain PL insurance limits of \$1M/\$2M and "Y" must maintain PL insurance limits of \$1M/\$2M.

10.3.7.6 If the Contractor is a limited-liability company, which members consist of two or more separate firms:

- .1** the Contractor may meet the requirements of this **Section 10.3.7** by providing a PL policy under which the limited-liability company is the insured; or
- .2** each member of the limited-liability company shall individually meet the requirements of this **Section 10.3.7** by providing a PL policy **(1)** under which the individual member is the insured and **(2)** that covers that member's interests in the limited-liability company by endorsement or otherwise. The certificate of insurance shall reflect that the PL policy covers the member's interest in the limited-liability company.

Example: Assume that the Contractor **(1)** is the "XY limited-liability company," the members of which are "X" and "Y"; and **(2)** is required under **Section 10.3.7** to maintain PL insurance limits of \$1M/\$2M. In order to comply with **Section 10.3.7.6.2**, "X" must maintain PL insurance limits of \$1M/\$2M and "Y" must maintain PL insurance limits of \$1M/\$2M.

10.3.8 Professional Liability—Subcontractors. If the Work to be performed by a Subcontractor includes any professional design services (including without limitation sprinkler and/or fire protection and other design-build work) the Subcontractor shall maintain contractor's PL insurance without design-build exclusions with limits not less than as identified in the following table:

Subcontract Sum	Each Claim	Annual Aggregate
Up to \$50,000,000	\$1,000,000	\$2,000,000
More than \$50,000,000	\$2,000,000	\$4,000,000

10.3.8.1 The PL policy shall have an effective date on or before the date that the Subcontractor first started to provide any Project-related services.

10.3.8.2 Upon submission of the associated certificate of insurance and at each policy renewal, the Contractor shall advise the Contracting Authority in writing of any actual or alleged claims that may erode the Subcontractor's PL policy's limits.

10.3.8.3 The Subcontractor shall maintain the PL insurance in effect for no less than five years after the earlier of termination of the Contract or Substantial Completion of all Work.

10.3.8.4 If the Subcontractor is authorized under Applicable Law to directly provide professional design services, the Subcontractor may satisfy the requirements of this **Section 10.3.7.5** by providing a professional liability insurance policy.

10.3.9 Aviation Liability. If the Contractor or a Subcontractor uses manned or unmanned aircraft, including helicopters, in performance of the Work, the Contractor shall maintain aircraft or aviation liability coverage in an amount of no less than \$10,000,000. The Contracting Authority and Owner will not be liable for any damage to any aircraft owned, leased, rented, or borrowed by the Contractor or a Subcontractor.

10.3.10 Watercraft Liability. If the Contractor or a Subcontractor uses watercraft in performance of the Work, the Contractor shall maintain watercraft liability coverage including protection and indemnity insurance in an amount of no less than \$5,000,000. The Contracting Authority and Owner will not be liable for any damage to any watercraft owned, leased, rented, or borrowed by the Contractor or Subcontractor.

10.3.11 Equipment Coverage. The Contracting Authority and Owner will not insure or be liable for damage to any Contractor or Subcontractor owned, leased, rented, or borrowed tools, equipment, or vehicles. The Contractor and Subcontractors are solely responsible for maintaining all insurance necessary to cover their tools, equipment, and vehicles.

10.3.12 Ocean Marine Insurance. If the shipment of equipment or materials for the Work will not be covered by the builder's risk insurance described under **Section 10.4**, the Contractor shall maintain ocean marine insurance to the Site including cost, insurance, and freight with limits of not less than an amount equal to the full replacement cost of equipment/materials shipped to final destination point. The insurance shall include the following minimum requirements:

10.3.12.1 all-risk basis including war risk and all forms of terrorism;

10.3.12.2 coverage for general average and salvage charges;

10.3.12.3 "on deck" coverage;

10.3.12.4 warehouse-to-warehouse coverage;

10.3.12.5 coverage to include losses from strikes, riots, and civil commotions ("SR&CC coverage");

10.3.12.6 coverage to include losses from free of capture and seizure warranty ("FC&S Warranty coverage");

10.3.12.7 "Inchmaree" clause;

10.3.12.8 sue and labor;

10.3.12.9 "both-to-blame" coverage;

10.3.12.10 free of particular average;

10.3.12.11 inland coverage including on-land shipment, port storage, and barge transit upon inland waterways; and

10.3.12.12 damage by saltwater and rainwater perils and cargo sweat.

10.3.13 Additional Property Insurance. For any demolition, blasting, excavating, tunneling, shoring, or similar operations, the Contractor shall provide and maintain Property Damage Liability insurance with a limit of liability equal to the limit as specified in the applicable sections of **Article 10**.

10.4 Builder's Risk Insurance

10.4.1 The Contractor shall maintain a builder's risk insurance policy written on a special causes of loss form and an open-perils basis providing coverage for direct physical loss of or damage to covered property arising from insured perils that shall not exclude: theft; fire; vandalism; malicious mischief; earthquake; earth movement; tornado; lightning; explosion; breakage of glass; flood; windstorm; collapse; water damage; hot and cold testing; debris removal and/or demolition occasioned by enforcement of Applicable Law; sudden and accidental equipment breakdown; and resulting damage from error, omission, or deficiency in construction methods, design, specifications, workmanship, or materials.

10.4.1.1 The policy shall cover the Project in the course of construction including false-work, temporary buildings and structures, and materials used in the construction process, stored on or off-site, or while in transit.

10.4.1.2 The coverage shall be written on a replacement-cost basis in an amount equal to not less than the initial Contract Sum, plus the value of: **(1)** all subsequent GMP Amendments and Modifications; **(2)** materials supplied and installed by others; and **(3)** any furnishings, fixtures, materials, or equipment located at the Site. All sub-limits of coverage are subject to the prior written approval of the Contracting Authority and Owner.

10.4.1.3 The policy shall not include any deductible of more than \$25,000 per occurrence. Any deductible over that amount is subject to the prior written approval of the Contracting Authority and Owner.

10.4.1.4 The named insureds under the policy shall include the State, Contracting Authority, Owner, Contractor, Subcontractors at all tiers, and Separate Contractors.

10.4.1.5 Coverage shall include the reasonable extra costs of acceleration and expediting temporary and permanent repairs to, or permanent replacement of, damaged property. Those covered costs shall include overtime wages and the extra cost of “express” or other means for rapidly transporting materials and supplies necessary to the repair or replacement.

10.4.1.6 Coverage shall include a “soft cost endorsement” including, but not limited to, the reasonable extra costs of the A/E and reasonable Contractor extension or acceleration costs.

10.4.1.7 Coverage shall waive all rights between the Owner, Contracting Authority, Contractor, and Subcontractors at any tier, for damages caused by fire or any other perils to the extent of actual recovery of any insurance proceeds under the policy.

10.4.1.8 Coverage shall include provisions for mechanical or electrical breakdown, or boiler system testing if a boiler system is part of the Work.

10.4.1.9 Coverage shall include temporary structures and scaffolding, along with collapse coverage.

10.4.1.10 Coverage shall be primary to all other applicable insurance.

10.4.1.11 The policy shall specifically permit and allow for Partial Occupancy as defined under the Contract Documents and for partial occupancy or a similar term as used under the policy.

10.4.1.12 The Contractor shall maintain the policy in effect until Substantial Completion of all Work. The Contractor shall provide written notice to the Contracting Authority no less than 30 days before the expiration or termination of the policy.

10.4.1.13 The Contractor’s tools and equipment shall not be covered under the builder’s risk policy. It is the Contractor’s sole responsibility to maintain such coverage, the cost of which shall be included in its Overhead (a component of Contractor’s Fee) and not included as a separate item in the Contractor’s Schedule of Values.

10.4.2 If the Contractor is involved solely in the installation of material and equipment and not in new building construction, the Contractor shall purchase and maintain a builder’s risk, builder’s risk-renovations, or installation floater insurance policy. The policy shall comply with the provisions of **Section 10.4.1**.

10.4.3 No less than ten days before the Contractor starts to perform any Work on the Site, the Contractor shall provide to the Contracting Authority an insurance-company certified copy of the complete insurance policy required under **Section 10.4.1** or **10.4.2** as applicable. The Contracting Authority’s receipt of that copy of the policy is a condition precedent to the Contractor’s entitlement to payment of any portion of the Contract Sum.

10.5 Waivers of Subrogation

10.5.1 To the fullest extent permitted by Applicable Law, the Contractor waives all rights against the Owner, Contracting Authority, and their agents and employees for damages to the extent covered by any insurance, except rights to the proceeds of that insurance. All policies shall accomplish the waiver of subrogation by endorsement or otherwise.

10.5.2 The Owner, Contracting Authority, and Contractor waive all rights against each other for damages caused by fire or other perils to the extent of actual recovery of any insurance proceeds under any property insurance, inland marine insurance, or builder’s risk insurance applicable to the Work.

10.6 Indemnification for Injury or Damage

10.6.1 To the fullest extent permitted by Applicable Law, the Contractor shall indemnify, defend, and hold harmless the Indemnified Parties from and against all claims, costs, damages, losses, fines, penalties, and expenses (including but not limited to all fees and charges of attorneys and other professionals, and all court, arbitration, or other dispute-resolution costs) arising out of or in connection with the Project, provided that any such claim, cost, damage, loss, fine, penalty, or expense is attributable to:

10.6.1.1 bodily injury, sickness, disease, or death, or to injury to or destruction of tangible property but only to the extent caused by the negligent acts, errors, or omissions of the Contractor or a person or entity for whom the Contractor may be liable;

10.6.1.2 infringement of patent rights or copyrights by the Contractor or a person or entity for whom the Contractor may be liable; or

10.6.1.3 a violation of Applicable Law but only to the extent attributable to the Contractor or a person or entity for whom the Contractor may be liable.

10.6.2 The Contractor’s indemnification obligation under **Section 10.6** exists regardless of whether or not and the extent to which the claim, damage, loss, fine, penalty, or expense is caused in part by a party indemnified under **Section 10.6**.

But nothing in **Section 10.6** obligates the Contractor to indemnify any individual or entity from and against the consequences of that individual or entity's own negligence.

10.6.3 The Contractor's obligations under **Section 10.6** shall not extend to the liability of the A/E, A/E's consultants, agents, representatives, or employees for negligent preparation or approval of Drawings, Specifications, Change Orders, opinions, and any other responsibility of the A/E, except to the extent covered by the Contractor's insurance.

10.6.4 In claims against an Indemnified Party by any direct or indirect employee (or the survivor or personal representative of that employee) of the Contractor or a person or entity for whom the Contractor may be liable, the indemnification obligation under **Section 10.6** will not be limited by a limitation on the amount or type of damages, compensation, or benefits payable under workers' compensation acts, disability benefit acts, or other employee benefit acts.

10.6.5 The Contractor's indemnification obligation under **Section 10.6** will not be limited by any insurance policy provided or required in connection with the Project.

10.6.6 The Contractor's obligations under **Section 10.6** shall not negate, abridge, or reduce other rights or obligations of indemnity, which would otherwise exist as to an Indemnified Party.

10.6.7 The Contractor's indemnification obligation under **Section 10.6** will survive termination of the Contract and Contract Completion.

10.6.8 The Contracting Authority may deduct from the Contract Sum the claims, damages, losses, fines, penalties, and expenses for which the Contractor is liable under **Section 10.6**. If those claims, damages, losses, fines, penalties, and expenses exceed the unpaid balance of the Contract Sum, the Contractor shall immediately pay the difference to the Owner.

ARTICLE 11 - SUSPENSION AND TERMINATION

11.1 Suspension of the Work

11.1.1 The Contracting Authority, without cause and without prejudice to any other right or remedy it may have, may order the Contractor in writing to suspend, delay, or interrupt performance of the Work in whole or in part for such period as the Contracting Authority may determine.

11.1.1.1 If the Contracting Authority suspends the Work under this **Section 11.1.1** and the Contractor complies with **Article 8**, the Contract Sum and Contract Times shall be adjusted for increases in the cost and time caused by the suspension, delay, or interruption. The adjustment of the Contract Sum, however, shall not include profit (a component of Contractor's Fee).

11.1.1.2 Notwithstanding the foregoing, no adjustment shall be made to the Contract Sum or Contract Times to the extent that:

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

11.1.1.3 If the Contracting Authority suspends the Work under this **Section 11.1.1** and the Contractor submits a proper Contractor Payment Request, subject to all other provisions of the Contract Documents, the Contractor shall be entitled to payment of compensation due under the Contract Documents for Work performed before the suspension based upon the Schedule of Values.

11.1.2 The Contracting Authority, without prejudice to any other right or remedy it may have, may order the Contractor in writing to suspend, delay, or interrupt the performance of the Work in whole or in part for such period as the Contracting Authority may determine for any of the following reasons: **(1)** Defective Work; **(2)** the Contractor is causing undue risk of damage to any part of the Project or adjacent area; **(3)** the Contractor fails to furnish or perform the Work in such a way that the complete Work will conform to the requirements of the Contract Documents; or **(4)** any other cause the Contracting Authority reasonably believes justifies suspension.

11.1.2.1 The Contracting Authority's exercise of its right to suspend the Work under this **Section 11.1.2** shall not entitle the Contractor to any adjustment of the Contract Sum, Contract Times, or both.

11.1.2.2 If the Contracting Authority is adjudged to have improperly or unjustifiably suspended the Work under this **Section 11.1.2**, the suspension shall be deemed to have been a suspension under **Section 11.1.1**.

11.1.3 Upon receipt of notice of suspension under this **Section 11.1**, the Contractor shall cease Work on the suspended activities and take all necessary or appropriate steps to limit disbursements and minimize respective costs. The Contractor shall furnish a report to the Contracting Authority, within five days after receiving the notice of suspension, describing the status of the Work, including, but not limited to, results accomplished, resulting conclusions, and other information as the Contracting Authority may require.

11.1.4 The Contracting Authority's right to stop the Work shall not give rise to any duty to exercise the right for the benefit of the Contractor or any other party, and the Contracting Authority's exercise or failure to exercise the right shall not prejudice any of the Contracting Authority's other rights.

11.2 Termination for Convenience

11.2.1 The Contracting Authority may at any time terminate the Contract in whole or in part for the Owner's convenience and without cause, upon ten days' written notice to the Contractor.

11.2.2 Upon receipt of the notice of termination for convenience, the Contractor shall immediately proceed with performance of the following duties in accordance with instructions from the Contracting Authority:

11.2.2.1 cease operation as specified in the notice;

11.2.2.2 place no further orders and enter into no further subcontracts for materials, labor, services, or facilities, except as necessary to complete continued portions of the Project;

11.2.2.3 terminate all subcontracts and orders to the extent they relate to the Work terminated;

11.2.2.4 proceed with Work not terminated; and

11.2.2.5 take actions that may be necessary, or that the Contracting Authority may direct, for the protection and preservation of the terminated Work.

11.2.3 Upon termination, the Contracting Authority shall pay the Contractor in accordance with the Schedule of Values for Work completed, including any retained funds, and the value of materials ordered and delivered, less any salvage credit the Contractor may receive for them.

11.2.3.1 All materials, equipment, facilities, and supplies at the Site or stored off-site, for which the Contractor has received payment, shall become the property of the Owner.

11.2.3.2 The Contractor is entitled to a fair and reasonable profit for Work performed and reasonable expenses directly attributable to termination of the Contract. In no event shall the Contractor be entitled to (1) Contractor's Fee on Work not performed or (2) compensation in excess of the total Contract Sum.

11.2.4 If the Contracting Authority terminates the Work under this **Section 11.2**, the termination shall not affect the rights or remedies of the State against the Contractor then existing or which may thereafter accrue.

11.2.5 Notwithstanding **Section 11.2.3**, if the Contracting Authority terminates the Work under this **Section 11.2**, but there exists an event of the Contractor's default, the Contractor shall be entitled to receive only such amounts as it would be entitled to receive following the occurrence of an event of default as provided in **Section 11.3**.

11.3 Termination for Cause

11.3.1 The Contracting Authority may terminate the Contract in whole or in part if the Contractor commits a material breach of the Contract including but not limited to:

11.3.1.1 failure to prosecute the Work with the necessary force or in a timely manner;

11.3.1.2 refusal to remedy Defective Work;

11.3.1.3 failure to supply enough properly skilled workers or proper materials;

11.3.1.4 failure to properly make payment to Subcontractors or Consultants;

11.3.1.5 performance of any services outside of the United States;

11.3.1.6 permitting its Subcontractors or Consultants to perform any services outside of the United States; or

11.3.1.7 disregarding laws, ordinances, or rules, regulations, or orders of a public authority with jurisdiction over the Project.

11.3.2 If the Contracting Authority intends to exercise its termination rights under this **Section 11.3**, the Contracting Authority shall issue not less than five days' written notice to the Contractor and the Contractor's Surety in accordance with ORC Section 153.17 ("Five-Day Notice").

11.3.2.1 Notwithstanding any provision of the Contract to the contrary **(1)** the issuance of a 72-Hour Notice under **Section 6.23.1** is not a condition precedent to the Contracting Authority's exercise of its rights under **Section 11.3** and **(2)** the Contracting Authority's decision to not issue a 72-Hour Notice under **Section 6.23.1** will not prejudice the Contracting Authority's rights under **Section 11.3**.

11.3.3 If the Contractor fails to satisfy the requirements set forth in the Five-Day Notice within 15 days after receipt of the Five-Day Notice, the Contracting Authority may declare the Contractor in default, terminate the Contract, and employ upon the Work the additional force or supply materials or either as appropriate, and remove Defective Work.

11.3.4 If the Contract is terminated, the Contractor's Surety may perform the Contract. If the Contractor's Surety does not commence performance of the Contract within ten days after the date of Contract termination, the Contracting Authority may complete the Work by any means the Contracting Authority determines appropriate. The Contracting Authority may take possession of and use all materials, facilities, and equipment at the Site or stored off-site, for which the State has paid.

11.3.5 If the Contract is terminated, the Contractor shall not be entitled to further payment. If the unpaid balance of the Contract Sum exceeds the costs of finishing the Work, including without limitation the fees and charges of engineers, architects, attorneys, and other professionals and court costs, and other damages incurred by the Owner and not expressly waived, the Contractor or Surety shall immediately pay the amount of the insufficiency to the Owner. This obligation for payment shall survive termination of the Contract.

11.3.6 If the Contractor's Surety performs the Work, the provisions of the Contract Documents govern the Surety's performance, with the Surety in place of the Contractor in all provisions including, but not limited to, provisions for payment for the Work, and provisions of the right of the Contracting Authority to complete the Work.

11.3.7 If the Contracting Authority terminates the Contract under this **Section 11.3**, the termination shall not affect any rights or remedies of the State against the Contractor then existing or which may thereafter accrue. The Contracting Authority's retention or payment of funds due the Contractor shall not release the Contractor or the Contractor's Surety from liability for performance of the Work in accordance with the requirements of the Contract Documents.

11.3.8 If the Contracting Authority is adjudged to have improperly or unjustifiably terminated the Contract under this **Section 11.3**, the termination will be deemed to have been a termination under **Section 11.2**.

11.4 Contractor Insolvency

11.4.1 The Contracting Authority may immediately terminate the Contract for cause if:

11.4.1.1 the Contractor commences a voluntary case under Title 11 of the United States Code or the corresponding provisions of any successor laws; or

11.4.1.2 any legal entity commences an involuntary case against the Contractor under Title 11 of the United States Code or the corresponding provisions of any successor laws and **(1)** the case is not dismissed within 60 days after its commencement; or **(2)** the court before which the case is pending issues an order for relief or similar order approving the case; or

11.4.1.3 a court of competent jurisdiction appoints, or the Contractor makes an assignment of all or substantially all of its assets to, a receiver, trustee, liquidator, or other similar custodian for the Contractor or all or substantially all of the Contractor's assets; or

11.4.1.4 any attachment, execution, or other judicial seizure is levied against all or substantially all of the Contractor's assets; or

11.4.1.5 the Contractor takes any action toward the dissolution or winding up of its business; or

11.4.1.6 the Contractor fails generally to pay its debts as they become due (unless those debts are subject to a good-faith dispute as to liability or amount) or it acknowledges in writing that it is unable to do so.

11.4.2 If the Contractor files a voluntary petition in bankruptcy or has an involuntary petition in bankruptcy filed against it, the Contractor, the Contractor as the debtor-in-possession, or the trustee of the Contractor's bankruptcy estate shall file a motion to assume or reject the Contract under Bankruptcy Code §365, 11 U.S.C. §365, within 20 days after the filing of the voluntary petition or involuntary petition and shall diligently prosecute that motion to conclusion so as to obtain an order granting or denying that motion within 45 days after the filing of the voluntary or involuntary petition.

11.4.3 If the Contracting Authority intends to exercise its termination rights under this **Section 11.4**, the Contracting Authority shall notify the Contractor in writing of the Contracting Authority's termination of the Contract and the cause(s) for that termination.

11.4.4 The Contractor agrees to the granting of relief from the automatic stay of the Bankruptcy Code, 11 U.S.C. §362(a), to permit the Contracting Authority to terminate the Contract for cause in such instance and issue and serve all notices necessary to terminate the Contract or arising out of the termination of the Contract and to take any and all other action necessary to terminate the Contract.

ARTICLE 12 - GENERAL PROVISIONS

12.1 Contractor's Documents and Contract Documents

12.1.1 Ownership.

12.1.1.1 The Owner alone owns the Contractor's Documents and the Contract Documents and every right, title, and interest therein.

- .1** The Contractor must execute and deliver and cause its employees and agents and all Subcontractors and Consultants to execute and deliver, to the Owner any transfers, assignments, documents, or other instruments (if any) necessary to vest in the Owner complete right, title, interest in and ownership of the Contractor's Documents and the Contract Documents.

12.1.1.2 The Contractor may retain copies, including reproducible copies, of the Contractor's Documents and the Contract Documents for information, reference, and performance of the Work.

12.1.1.3 The submission or distribution of the Contractor's Documents or the Contract Documents to meet official regulatory requirements or for similar purposes in connection with the Project is not a waiver of the Owner's reserved rights in the Contractor's Documents and the Contract Documents. Any unauthorized use of the Contractor's Documents or the Contract Documents shall be at the sole risk of the entity making the unauthorized use.

12.1.1.4 The Contractor shall provide Electronic Files (in native format) to Separate Consultants and Separate Contractors for their use in connection with the Project. The Contractor shall provide the Electronic Files **(1)** at no additional cost to the Separate Consultants, Separate Contractors, and Owner and **(2)** without requiring the Separate Consultants, Separate Contractors, or Owner to agree to any terms or conditions concerning the provision, receipt, or use of the Electronic Files that differ in any material respect from the Contract.

12.1.2 Intent.

12.1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor.

12.1.2.2 The Contract Documents are complementary, and what is required by one is binding as if required by all.

12.1.2.3 The Contractor shall provide all labor and materials necessary for the entire completion of the Work described in the Contract Documents and reasonably inferable to produce the intended results.

12.1.2.4 The Drawings govern dimensions, details, and locations of the Work. The Specifications govern quality of materials and workmanship.

12.1.2.5 The organization of the Specifications in divisions, sections, and articles, and the arrangement of Drawings shall not restrict the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

12.1.2.6 In the event of inconsistency or conflict within the Contract Documents, the Contractor shall provide the better quality or greater quantity of Work, and comply with the stricter requirement.

12.1.2.7 Unless otherwise defined in the Contract Documents, words that have well-known technical or construction industry meanings are used in accordance with those recognized meanings.

12.1.2.8 The Sections of Division 01 - "General Requirements" govern the performance of the Work of all Sections of the Specifications.

12.1.3 Use of Electronic Files.

12.1.3.1 The Owner, Contracting Authority, A/E, and Contractor reasonably expect that they will provide Electronic Files to each other to facilitate the design and construction of the Project consistent with current practices and customs in the construction industry.

12.1.3.2 The Owner, Contracting Authority, A/E, and Contractor acknowledge that the use of Electronic Files involves risks not generally associated with the use of paper documents. Those risks include, for example and

without limitation, alteration (inadvertent or intentional) and deterioration, both of which may not be readily apparent through casual observation.

12.1.3.3 The Owner, Contracting Authority, A/E, and Contractor do not warrant to each other that any Electronic File they provide **(1)** was not altered through transmission; **(2)** is compatible with the recipient's computer system or software; **(3)** will not be altered through degradation of the recipient's storage media; or **(4)** is suitable for conversion/translation to and subsequent use in a system or format other than the Electronic File's original system or format.

12.1.3.4 Before relying on any Electronic File it receives, the recipient is responsible for verifying that the Electronic File was not altered through transmission, degradation of the recipient's own storage media, or other causes.

12.1.3.5 If the recipient of an Electronic File converts/translates the Electronic File from its original system or format to an alternate system or format, the recipient assumes the risk that the conversion/translation created errors in the converted/translated file.

12.1.3.6 The Owner, Contracting Authority, A/E, and Contractor shall each maintain and operate its own computer systems and storage media in a commercially reasonable way and take reasonable steps to prevent errors in and deterioration of the Electronic Files it creates, provides, and receives.

12.1.3.7 In the event of a discrepancy between information contained in a paper version of a document and the Electronic File of that document, the paper version will govern.

12.1.3.8 This **Section 12.1.3** does not relieve the Contractor of its responsibility for the preparation, completeness, or accuracy of the Contractor's Documents.

12.2 Public Relations

12.2.1 Publicity prior to completion of the Project. Prior to completion of the Project, public relations or publicity about the Project shall be solely within the control, and with the consent of, the Owner.

12.2.2 Publicity after completion of the Project. After completion of the Project, the Contractor may exercise reasonable public relations and marketing efforts related to the Project, provided the Contractor properly identifies the Owner and Contracting Authority, and their participation in the Project.

12.2.3 Professional Photography. If the Contractor commissions photography of the completed Project, the Contractor shall include in its photography agreements a release for unrestricted and unlimited use of photographs by the Owner and Contracting Authority, and shall provide the Owner and Contracting Authority with a reasonable quantity of photographs for use in the Owner's and the Contracting Authority's marketing and awareness activities, including, but not limited to, profiles of the Project on their respective websites.

12.2.4 Craft Awards and Other Recognition. If the Contractor submits the Project for craft awards or other similar venues for recognition of the Project, the Contractor shall properly identify the Owner and Contracting Authority, and their participation in the Project. In addition, if the Project receives any craft award or other recognition, the Contractor shall provide duplicate copies of the award plaque or other memento of the award to the Owner and Contracting Authority.

12.3 Application and Governing Law

12.3.1 The Contract and the rights of the parties thereunder shall be governed by the laws of the state of Ohio and only Ohio courts shall have jurisdiction over any action or proceeding concerning the Contract and/or performance thereunder. The Contractor irrevocably consents to such jurisdiction.

12.3.2 The parties to the Contract shall comply with Applicable Law.

12.3.3 Other rights and responsibilities of the Contractor, A/E, Contracting Authority, and Owner are set forth throughout the Contract Documents and included under different titles, articles, and paragraphs for convenience.

12.4 Conditions of the Contract

12.4.1 These General Conditions govern, take precedence over, and shall not be superseded or amended by Drawings and Specifications, unless so provided in Supplementary Conditions prepared by the Contracting Authority and approved by the Ohio Facilities Construction Commission.

12.5 Notice of Commencement.

12.5.1 The Contracting Authority shall prepare a Notice of Commencement and make it available as required under ORC Section 1311.252.

12.5.2 Upon request, the Contracting Authority or the Contractor shall furnish the Notice of Commencement to Subcontractors or any other member of the public.

12.6 Written Notice

12.6.1 Notice under the Contract Documents shall be validly given if:

12.6.1.1 delivered personally to a member of the organization for whom the notice is intended;

12.6.1.2 delivered by trackable delivery service, or sent by registered or certified mail, to the last known business address of the organization; or

12.6.1.3 sent by facsimile, email, or web-based project management software, provided the original, signed document is delivered within three business days after the date of the electronic transmission.

12.6.2 When the Owner, Contracting Authority, A/E, or Contractor gives notice to one of the other three, it shall also simultaneously send a copy of that notice to the others.

12.6.3 A copy of all notices, certificates, requests, or other communications to the Contracting Authority shall be sent to the Project Manager.

12.6.4 In the event of an emergency involving the Project, including, but not limited to, a fatality, serious injury, fire, collapse, flood, utility, or power loss to occupied facilities, explosion, or environmental damage, the Contractor shall immediately notify the A/E, Contracting Authority, and Owner by the most expedient means available.

12.6.5 The Contracting Authority, Owner, A/E, or Contractor may, by written notice given hereunder, designate addresses, telephone numbers, email addresses, or facsimile numbers to which notices, certificates, requests, or communications shall be sent.

12.7 Taxes

12.7.1 Only those materials that ultimately become a part of the completed structure or improvement that constitutes the Project shall be exempt from state sales tax and state use tax.

12.7.2 The purchase, lease, or rental of material, equipment, parts, or expendable items as concrete form lumber, tools, oils, greases, and fuels, which are used in connection with the Work, are subject to the application of state sales tax and state use tax.

12.8 Computing Time

12.8.1 When the Contract Documents refer to a period of time by a number of days, the period shall be computed to exclude the first and include the last day of the period. If the last day of the period falls on a Saturday, Sunday, or a legal holiday, that day shall be omitted from the computation and the period shall end on the next succeeding day that is not a Saturday, Sunday, or legal holiday.

12.8.2 Except as excluded under **Section 12.8.1**, the Contract Times and all other periods referred to in the Contract Documents includes Saturdays, Sundays, and all days defined as legal holidays by **Section 12.8.4**.

12.8.3 The standard workdays for State projects are Monday through Friday, excluding legal holidays.

12.8.4 Legal holidays are as follows:

12.8.4.1 New Year's Day – First Day in January;

12.8.4.2 Martin Luther King Jr. Day – Third Monday in January;

12.8.4.3 Washington-Lincoln (President's) Day – Third Monday in February;

12.8.4.4 Memorial Day – Last Monday in May;

12.8.4.5 Juneteenth Day – Nineteenth Day of June;

12.8.4.6 Independence Day – Fourth day of July;

12.8.4.7 Labor Day – First Monday in September;

12.8.4.8 Columbus Day – Second Monday in October;

12.8.4.9 Veterans' Day – Eleventh Day of November;

12.8.4.10 Thanksgiving Day – Fourth Thursday of November; and

12.8.4.11 Christmas Day – Twenty-fifth day of December.

12.8.5 If a legal holiday falls on a Saturday, it is observed on the preceding Friday. If a legal holiday falls on a Sunday, it is observed on the following Monday.

12.9 Time of the Essence

12.9.1 Time limits stated in the Contract Documents are of the essence of the Contract and all obligations under the Contract. By signing the Agreement, the Contractor acknowledges that the Contract Times are reasonable, taking into consideration the usual weather and other conditions prevailing in the locality of the Project. By signing the Construction Schedule, the Contractor acknowledges that the specified Milestone dates are reasonable, taking into consideration the usual weather and other conditions prevailing in the locality of the Project.

12.9.1.1 The Notice to Proceed establishes the date for commencement of the Work.

12.9.1.2 The Contractor acknowledges that the Owner has entered into, or may enter into, agreements for use of all or part of the premises where the Work is to be completed based upon the Contractor achieving Contract Completion within the associated Contract Time.

12.9.1.3 The Contractor shall perform the Work in a reasonable, efficient, and economical sequence, and in the order and time as provided in the Construction Progress Schedule.

12.9.1.4 The Contractor acknowledges that it may be subject to interference, disruption, hindrance, or delay in the progress of the Work from any cause.

12.10 Successors and Assigns

12.10.1 The Contracting Authority and Contractor each bind themselves, their successors, assigns, and legal representatives, to the other party to this Contract and to the successors, assigns, and legal representatives of the other party with respect to all terms of this Contract.

12.10.2 The Contracting Authority and Contractor each acknowledge that the Owner is an intended third-party beneficiary of this Contract.

12.10.3 The Contractor shall not assign or transfer any right, title, or interest in this Contract without the Contracting Authority's prior written consent.

12.11 Extent of Contract

12.11.1 Entire Contract. Contract Documents represent the entire and integrated agreement between the Contracting Authority and Contractor and supersede all prior negotiations, representations, or agreements, either written or oral.

12.11.2 Multiple Counterparts. This Contract may be executed in any number of counterparts, each of which shall be regarded as an original and all of which shall constitute but one and the same instrument.

12.11.3 Captions. The captions and headings in this Contract are for convenience only and in no way define, limit, or describe the scope or intent of any provisions or sections hereof.

12.11.4 Precedence. If there are any inconsistencies between the provisions of the Contract Documents and the provisions of the Contract, the provisions of this Contract shall prevail.

12.12 Severability

12.12.1 If any term or provision of this Contract or the application thereof to any Person or circumstance, is finally determined to be invalid or unenforceable by a court of competent jurisdiction, the remainder of this Contract or the application of such term or provision to other Persons or circumstances, shall not be affected thereby, and each term and provision of this Contract shall be valid and enforced to the fullest extent permitted by Applicable Law.

12.13 Electronic and Facsimile Signatures

12.13.1 Any party hereto may deliver a copy of its counterpart signature page to this Contract via electronic signature software, fax, e-mail, or web-based project management software. Each party hereto shall be entitled to rely upon an electronic, scanned, or facsimile signature of any other party delivered in such a manner as if such signature were an original.

12.14 No Third-Party Interest

12.14.1 Except as expressly provided under **Sections 6.2.3** through **6.2.6** and **Section 12.10.2, (1)** no person or entity, other than the Contracting Authority, Owner, and Contractor, will have any right or interest under the Contract, and **(2)** the Contract does not create a contractual relationship of any kind between any people or entities other than the Contracting Authority, Owner, and Contractor.

12.15 Ohio Retirement System

12.15.1 All individuals employed by the Contractor that provide personal services to the Contracting Authority or Owner are not public employees for the purposes of ORC Chapter 145, as amended.

12.15.2 If the Contractor is a PERS retirant, as defined by ORC Section 145.38, the Contractor shall notify the Contracting Authority of such status in writing prior to commencement of Work. The Contracting Authority, Owner, or State is not responsible for changes to the Contractor's retirement benefits resulting from entering into this Contract.

12.16 No Waiver

12.16.1 The failure of the Contracting Authority or Contractor to insist in any one or more instances upon the strict performance of any one or more of the provisions of the Contract or to exercise any rights under the Contract or provided by law will not be construed as a waiver or relinquishment of that provision or right or of the right to subsequently demand strict performance or exercise the right and the rights will continue unchanged and remain in full force and effect.

12.17 Rights and Remedies

12.17.1 The duties, obligations, rights, and remedies under the Contract are in addition to and not a limitation of the duties, obligations, rights, and remedies otherwise imposed by or available under Applicable Law.

12.18 Survival of Obligations

12.18.1 All representations, indemnity obligations, warranties, guarantees, and necessarily continuing obligations under the Contract, will survive final payment, completion and acceptance of the Work, and termination or completion of the Contract.

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END OF DOCUMENT

Document 00 73 00 - Supplementary Conditions (General Contracting)

State of Ohio Standard Requirements for Public Facility Construction

Ohio Department of Natural Resources

Certifications

These Supplementary Conditions amend and supplement the General Conditions and other provisions of the Contract Documents as indicated below. All provisions not amended remain in full force and effect. The terms in these Supplementary Conditions defined in the Contracting Definitions or the General Conditions shall have the meanings assigned to them in those documents.

These Supplementary Conditions are authorized, by the Ohio Facilities Construction Commission, for use on projects constructed by Ohio Department of Natural Resources.

Contracting Authority

Ohio Department of Natural Resources
2045 Morse Road E-3
Columbus, OH 43229
(614) 265-6948
www.dnr.ohio.gov

Institutional Designee

Jeremy Wenner, P.E.
Chief Engineer
Ohio Department of Natural Resources
2045 Morse Road, Bldg. E-3
Columbus, OH 43229
(614) 265-6948

MODIFICATIONS TO 00 72 13 GENERAL CONDITIONS

Add Section 1.2.2.5 with the following:

1.2.2.5 By executing a Contract, the Contractor certifies that it based its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.16

Add Section 1.2.2.6 with the following:

1.2.2.6 On the occasion of the first pay date under this contract, the Contractor and subcontractors shall furnish each employee not covered by a collective bargaining agreement with individual written notification of the job classification to which the employee is assigned, the current wage rate schedule determined by the Ohio Department of Commerce, Wage and Hour Bureau for the Project to be applicable to that classification, separated into the base rate or hourly rate of pay and the amount of fringe benefits. The Contractor and subcontractors shall furnish the same notification to each affected employee every time the job classification of the employee is changed and every time the hourly rate of pay and the fringe benefits are changed. A copy of each employee notification shall be provided to the Owner's Prevailing Wage Coordinator prior to submittal of certified payroll including that particular employee.

Replace Section 5.1.1 with the following:

5.1.1 The formation of a cohesive, mutually beneficial partnering arrangement among the Contractor, Contracting Authority, A/E, and Owner will accomplish the construction of the Project most effectively and efficiently. This arrangement draws on their collective strengths, skills, and knowledge to achieve a Project of the intended quality, within budget, and on schedule. To achieve that objective, participation in a partnering session may be required for the following key stakeholders.

Replace Section 5.1.4 with the following:

5.1.4 Formal contractual relations, responsibilities, and liabilities are not affected by any partnering arrangement. The cost associated with engaging the services of the Neutral Facilitator will be covered by the Ohio Department of Natural Resources. The Contractor shall include in its base bid the resources necessary to participate in the partnering session.

Insert Sections 6.3.4.2 and 6.3.4.3 as follows:

6.3.4.2 The Contractor is responsible for re-issuing, updating or otherwise renewing any location requests in accordance with requirements.

6.3.4.3 The Owner will not locate utility lines owned by the State within the State's property limits. The Contractor shall locate any utilities owned by the Owner, other State agencies, or any other owners that do not provide locate services.

In Section 6.7.1, replace the first sentence with the following:

"If A/E requires, the Contractor shall prepare drawings ("Coordination Drawings") after the Contractor and appropriate Subcontractors ("Coordination Participants") (1) determine the sequence of the Project, (2) identify the areas requiring special attention ("Coordination Areas"), and (3) determine the need for a coordination drawing in any Coordination Area.

Replace Sections 8.11.1 through 8.11.5 with the following:

8.11.1 The Contractor may request review of the Project Manager's decision by written notice delivered to the Director of the Ohio Department of Natural Resources by certified mail with 14 days of the Project Manager's decision.

8.11.2 The Director shall schedule and conduct a meeting within 30 days after receiving the Contractor's request for review. The Director may employ independent resources to assist in the meeting and review.

8.11.3 The Director shall determine the final disposition of the Contractor's request for review and provide a written decision to the Contractor with 14 days after the meeting.

8.11.4 The decision of the Director is the final administrative decision of ODNR as described under ORC Section 153.21(B).

8.11.5 If the Contractor and Owner agree with the Director's decision, the decision shall be incorporated into a Change Order.

Replace Section 8.12.1 with the following:

8.12.1 No provision of this **Article 8** shall prevent the Director from delegating the duties of the authorities of the Commission to any other person selected at the Director's sole discretion.

Replace Section 9.3.1 with the following:

9.3.1 Within 10 days after receipt of the Notice to Proceed, or other period mutually agreed by the Contractor and Contracting Authority. The Contractor shall submit to the A/E a Schedule of Values on a form provided by the Owner, with separate amounts shown for labor and material for each branch of Work, following the numbers and titles of the Construction Specifications Institute's *Master Format* for individual work results, or *UniFormat* for assemblies in place.

Replace Section 10.4.2 with the following:

10.4.2 If the Contractor is involved solely with the installation of material and equipment and not in new construction, the Contractor shall purchase and maintain a builder's risk, builder's risk-renovations, or installation floater insurance policy as determined appropriate by the Contracting Authority. The policy shall comply with the provisions of **Section 10.4.1**.

Insert Section 12.19 with associated Sections as follows in its entirety:

12.19 Public Records

12.19.1 The parties to the Agreement understand that the Contracting Authority and the Owner are subject to Ohio's Public Records laws and that any records regarding this project may be subject to disclosure pursuant to a public records request. If a party asserts an exemption to Ohio's Public Records laws e.g. trade secrets, the burden will be on the party asserting the exemption to take appropriate legal action, e.g. a court order, to prevent the disclosure of the records in question.

MODIFICATIONS TO 00 71 00 CONTRACTING DEFINITIONS

Add:

Ohio Department of Natural Resources The authorized contracting agent for public improvement projects in accordance with ORC Chapter 1501.011, acting by and through its Director.

MODIFICATIONS TO 00 73 43 WAGE RATE REQUIREMENTS

Replace 1.1.5:

1.1.5 By executing a Contract, the Contractor certifies that it based its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.14.

Replace 1.2.1:

1.2.1 The prevailing wage rates are available at the Ohio Department of Commerce's web site:
<http://com.state.oh.us/>.

END OF DOCUMENT

Document 00 73 43 - Wage Rate Requirements

State of Ohio Standard Requirements for Public Facility Construction

PREVAILING WAGE RATES

1.1 Payment of Prevailing Wage Rates

1.1.1 The Contractor shall pay the prevailing wage rates of the Project locality, as issued by the Ohio Department of Commerce, Wage and Hour Bureau to laborers and mechanics performing Work on the Project.

1.1.2 The Contractor shall comply with the provisions, duties, obligations, and is subject to the remedies and penalties of ORC Chapter 4115.

1.1.3 If the Contractor or its Subcontractors fail to comply with ORC Chapter 4115, the Contracting Authority may withhold payment pursuant to **Section 9.8.2.5** of the **General Conditions**. The Contractor is liable for violations committed by the Contractor or its Subcontractors to the extent provided in ORC Chapter 4115.

1.1.4 The Contractor shall submit all payroll reports in compliance with the requirements of **Section 1.2** for all employees of the Contractor and of the Contractor's Subcontractors.

1.1.5 By executing a Contract, the Contractor certifies that it based its Bid upon the prevailing rates of wages as ascertained by the Ohio Department of Commerce, Wage and Hour Bureau for the Project as provided in ORC Sections 4115.03 through 4115.14, which are inserted at the end of this Document.

1.2 Prevailing Wage Rate Revisions

1.2.1 The Contracting Authority shall, within 7 business days after receipt of a notice of a change in the prevailing wage rates, notify the Contractor of the change. The prevailing wage rates are available at the Ohio Department of Commerce's web site: <http://com.state.oh.us/>.

1.2.2 The Contractor shall pay any revised wage rates issued during the term of the Contract.

1.3 Payroll Schedule

1.3.1 Within 10 days of the date of the Notice to Proceed, the Contractor shall provide the Contracting Authority's Prevailing Wage Coordinator a schedule of dates during the term of the Contract on which wages shall be paid to employees for the Project.

1.4 Payroll Reports

1.4.1 The Contractor shall submit payroll reports with each Contractor Payment Request, which reports shall be certified by the Contractor that the payroll is correct and complete, and that the wage rates shown are not less than those required by the Contract. The Contractor is responsible for submitting all payroll reports of its Subcontractors.

1.4.1.1 Each payroll report shall indicate the period covered and include a list containing the name, address, and last four digits of the social security number of each employee of the Contractor and its Subcontractors paid for the Work.

1.4.1.2 Each payroll report shall list the number of hours each employee worked each day on the Project during the reporting period, the total hours each week on the Project, the employee's hourly rate of pay, job classification, hourly rate of fringe benefits, and all deductions from wages and net pay.

1.4.1.3 Each payroll report shall list each fringe benefit and state if it is paid as cash to the employee or to a named plan.

1.4.1.4 The Contractor and its Subcontractors shall submit apprenticeship agreements for all apprentices utilized on the Project with the first payroll report from the Contractor or its Subcontractor that includes apprentices.

END OF DOCUMENT

1. PART 1 - GENERAL

1.1 SUMMARY OF WORK

A The Project consists of construction for:

1. Project Location: Grand Lake St. Marys State Park
834 Edgewater Dr
St Marys, OH 45885
2. Owner: Ohio Department of Natural Resources, Division of Wildlife
2045 Morse Road, Building G
Columbus, OH 43229

1.2 DIVISION OF THE PROJECT

A Item 1 – General Trades Work

- 1) The work consists of the necessary labor, equipment, tools and materials for a new park office.

1.3 ABBREVIATIONS

A Reference to technical society's organization, bodies, or documents, is made in specifications, in accordance with the following abbreviations.

AIA	American Institute of Architects
ACI	American Concrete Institute
IEEE	Institute of Electrical Electronics Engineers
AISC	American Institute of Steel Construction
ANSI	American National Standards Institute, Inc.
ASL	American Society of Landscape Architects
ASM	American Society of Mechanical Engineers
ASTM	American Society of Testing Materials
AWSC	American Welding Society Code
FS	Federal Specifications
NAMM	National Association of Architectural Metal Manufacturer
NFPA	National Fire Protection Association
NBS	National Bureau of Standards
NEC	National Electric Code
ODOT	Ohio Department of Transportation
SJI	Steel Joist Institute
SPR	Simplified Practice Recommendation
UL	Underwriters' Laboratories, Inc.
USGBC	United States Green Building Council

1.4 WORKER'S COMPENSATION CERTIFICATE

- A Prior to entering into any Contract in whose fulfillment any employee (s) of the Contractor might be engaged at the site, the Industrial Commission of Ohio must certify that the Corporation, Partnership, or person so awarded the Contract has complied with each and every condition of the act of February 26, 1913, and of all acts amendatory or supplementary thereto, known as the Worker's Compensation Law, Section 153.08 RC., and Section 5123.01 etc. seq., R.C.

1.5 DEFINITIONS

- A Definitions pertaining to sustainable development: As defined in ASTM E2114 and as specified herein.

1.6 DOCUMENTS REQUIRED PRIOR TO SIGNING CONTRACT

- A Immediately upon the award of, and prior to the signing of the Contract, the successful bidder shall furnish to the Architect:
 - 1. A Contract Cost Breakdown showing itemized labor and material amounts for the total contract price.
 - 2. Name of Casualty Insurance Company insuring work.
 - 3. A Worker's Compensation Certificate.
 - 4. To support the Contract Bond, the successful bidder shall also furnish:
 - a) Credentials showing the Power of Attorney
 - b) A Certificate of Compliance issued by the Department of Insurance showing the Bonding Company is licensed to do business in the State of Ohio.
 - c) Financial Statement of Bonding Company
 - 5. List of Sub Contractors & Material Suppliers

1.7 CODES AND STANDARDS

- A When codes and standards are referred to, they shall be current approved copies. It shall be the duty of the supplier of any material on this work to submit evidence, when requested, that his material is in compliance with the applicable codes and standards, and the method in which the material is used in this project.

1.8 USE OF PREMISES

- A The Owner will make available portions of the sites during the scheduled period of construction. Each contractor will be expected to complete the work in accordance with the project time schedule.

- B During the construction period, the Contractor shall take every precaution to protect the premises from damage or unauthorized entry.

1.9 STORAGE OF MATERIALS

- A Certain areas of the site will be restricted for use by the Contractors for on-site work storage of materials. The Contractors shall use such areas as designated by the Architect and/or Owner.

1.10 CLEANING UP

- A The Contractor shall frequently clean up and dispose of all refuse, rubbish, scrap materials and debris caused by his operations to the end that at all times the site shall present a neat, orderly and workmanlike appearance. Crates and cartons in which materials, equipment, or fixtures are received shall be removed daily.
- B The parking lot shall be kept free of debris and swept weekly or as may be necessary.
- C If in the opinion of the Architect, neatness is not maintained, the Architect may have the area cleaned and charge the costs to the Contractor. The Architect may pro-rate the cost of clean-up to all Division Contractors if responsibility is not clear, and the Owner may withhold such charges from amounts owing to Subcontractors and pay the same directly to the persons doing such work.
- D The electrical sub contractor shall clean all light fixtures and switchgear after the completion of the building.
- E The General Contractor and all Sub Contractors at the completion of their branch of work, shall remove all surplus material, false work, and debris of every nature resulting from their operations and put the site in a neat and orderly condition.

1.11 WORK HOURS

- A Work on this project shall be permissible from 7AM - 5PM, Monday through Friday. All weekend or after hour work shall require advance written approval of Owner. All noisy work shall be performed outside of normal operating hours and be coordinated with the owner prior to taking place.

1.12 JOB MEETING

- A The Project Architect shall schedule weekly or bi-weekly job progress meeting between himself, and Contractor and major Subcontractors. The Architect shall take minutes of the meeting and distribute them.

1.13 FEDERAL FUND REQUIREMENTS

- A This project is federally assisted. Contracts to be awarded under this Bid will be subject to federal laws and related acts that are referenced in this bid package.

241224
Ohio Department of Natural Resources
Grand Lake St. Marys State Park – Park Office
DNR-250013

B See the following document for additional information.

2. PART 2 - PRODUCTS

3. PART 3 - EXECUTION

◆ END OF SECTION ◆

1. PART I – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Special Conditions and other Division 1 specification Sections, apply to Work of this Section.

1.2 SUMMARY

- A. Related Requirements Specified Elsewhere
 - 1) 00 52 00 – Agreement Form
 - 2) 01 40 00 – Quality Requirements
- B. Designate in Construction Schedule delivery dates for product.
- C. Designate in Contract Cost Breakdown separate item for cost allowances for work.

1.3 ALLOWANCES

- A. Provide Work under allowance only as directed by Architect/Engineer in accordance with the Contract Documents.
- B. Allowances are for various utility fees, tap fees, etc. called for, or reasonably implied in the Contract Documents.
- C. Include following additional dollar amounts in Base Bid for inclusion in Contract Sum:
 - 1) General Trades (BP 101):
 - a) Allowance A-1: Utility Fees \$30,000.00
 - b) Allowance A-2: FFE \$60,000.00
- D. Include the following additional material allowances in Base Bid for inclusion in the contract.
 - 1) NONE.
- E. Amount of Allowance includes:
 - 1) Net cost of product
 - 2) Delivery to the site

- 3) Applicable taxes

1.4 DELIVERY

A. Contractor Responsibility:

- 1) Arrange for delivery and unloading
- 2) Promptly inspect product for damage or defects
- 3) Submit claims for transportation damage

1.5 INSTALLATION

- ##### A. Comply with reference Specification Section requirements.

1.6 ADJUSTMENT OF CASH ALLOWANCES

- ##### A. Unused amounts of monies included under allowances shall be credited to the Owner by deduct Change Order prior to approval of Final Application for Payment.
- ##### B. The contractor shall notify the architect in writing as soon as they have knowledge that an allowance may be exceeded.

2. **PART II – PRODUCTS (NOT APPLICABLE)**

3. **PART III – EXECUTION (NOT APPLICABLE)**

◆ END OF SECTION ◆

1. PART 1 - GENERAL CONSTRUCTION NOTES

- 1.1 Each bidder shall submit with his bid, on the forms provided, alternate proposals stating the difference in price (additions or deductions) from the lump sum bid for substitutions omitting or changing the following materials of construction from that shown on the drawings and specified.
- 1.2 The difference in price shall include all omissions, additions, and adjustments as may be necessary because of each change, substitution or omission.

2. PART 2 – DESCRIPTION OF ALTERNATES

2.1 Alternate 1 – Ceramic Tile

- A. This alternate consists of all labor and materials to install ceramic wall tiles in the restrooms.

2.2 Alternate 2 –Standing seam metal roof instead of shingle roof.

- A. This alternate consists of all associated work to furnish all materials and to perform all labor to install a standing seam metal roof system instead of a shingle roof system. See drawings A401.1, A401.2 and A101.3.

2.3 Alternate 3 – Additional Casework and Casework upgrades.

- A. This alternate consists of all labor and materials to provide and install additional casework and upgrade some of the base bid casework.

2.4 Alternate 4 – Pedestrian Lighting and Additional Lighting

- A. This alternate consists of all labor and materials to provide track lighting and lighting in the cupola. See drawing E100.1. And this alternate consists of all associated work to furnish all materials and to perform labor to install pedestrian lighting. See drawing ESP1.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1) Section 012300 "Alternates" for products selected under an alternate.
 - 2) Section 016000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1) Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2) Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number with title and Drawing numbers with titles.
 - 1) Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a) Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b) Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by

Owner and separate contractors, that will be necessary to accommodate proposed substitution.

- c) Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d) Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e) Samples, where applicable or requested.
 - f) Certificates and qualification data, where applicable or requested.
 - g) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i) Research reports evidencing compliance with building code in effect for Project.
 - j) Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k) Cost information, including a proposal of change, if any, in the Contract Sum.
 - l) Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 2) Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify the General Contractor of acceptance

or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.

- a) Forms of Acceptance: Submittal Approval, Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
- b) Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests if recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

2. PART 2 - PRODUCTS

2.1 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1) Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a) Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b) Substitution request is fully documented and properly submitted.
 - c) Requested substitution will not adversely affect Contractor's construction schedule.
 - d) Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e) Requested substitution is compatible with other portions of the Work.

- f) Requested substitution has been coordinated with other portions of the Work.
- g) Requested substitution provides specified warranty.
- h) If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

B. Substitutions for Convenience: Not allowed.

3. PART 3 - EXECUTION (Not Used)

◆ END OF SECTION ◆

PROJECT MANAGEMENT AND COORDINATION

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1) Project Contact List
 - 2) General Coordination Procedures
 - 3) Project Schedule
 - 4) Coordination of As-Built Drawings
 - 5) Requests for Information (RFIs)
 - 6) Substitution Procedures
 - 7) Change Order Procedures
 - 8) Submittal Procedures
 - 9) Project Meetings
- B. Each contractor shall participate in coordination requirements. Certain areas of responsibility are assigned to a specific contractor.
- C. Related Requirements:
 - 1) Quality Control – Section 01 45 00
 - 2) Temporary Facilities – Section 01 50 00
 - 3) Project Closeout and Warranties – Section 01 78 00
 - 4) Operating and Maintenance Data – Section 01 78 05
 - 5) Project Record Documents – Section 01 78 39

1.3 DEFINITIONS

- A. RFI: Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 PROJECT CONTACT LIST

- A. Subcontract List: Provide to AE a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1) Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2) Number and title of related Specification Section(s) covered by subcontract.
 - 3) Drawing number and detail references, as appropriate, covered by subcontract.
- B. Key Personnel List: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses and telephone numbers, including office, and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1) Distribute list to Owner and AE.
 - 2) Post copies of list in temporary field office.
 - 3) Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1) Schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2) Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.

- 3) Make adequate provisions to accommodate items scheduled for later installation.
 - 4) Provide daily huddles to coordinate work and schedule with all trades doing work on site.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
- 1) Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities and scheduled activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
- 1) Preparation of Contractor's construction schedule.
 - 2) Preparation of the schedule of values.
 - 3) Installation and removal of temporary facilities and controls.
 - 4) Delivery and processing of submittals.
 - 5) Progress meetings.
 - 6) Preinstallation conferences.
 - 7) Project closeout activities.
 - 8) Startup and adjustment of systems.
 - 9) Training and Demonstration.
 - 10) Change order processing.
- D. Conservation: Coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1.6 PROJECT SCHEDULE

- A. Accepted Schedules will be used to plan organize, and execute the work, to measure the progress of the work, to coordinate and complete remaining work, to aid in evaluating time extensions, and to provide the basis for all progress payments.

- B. Failure to maintain Schedules in a contract compliant status may result in withholding payment until the schedule is accepted.
- C. Contractor Submittals
 - 1) 90-Day Preliminary Schedule with Narrative Report
 - a) Shall be submitted for acceptance within 30 calendar days after the Notice to Proceed is issued.
 - b) Defines the Contractor's planned operations for the first 90 calendar days.
 - 2) Baseline Schedule with Narrative Report:
 - a) Shall be submitted for acceptance within 90 calendar days after the Notice to Proceed is issued.
 - b) Defines the Contractor's planned operations for the duration of the contract to completion, issuance of the Certificate of Substantial Completion.
 - 3) Monthly Progress Schedules with Narrative Report:
 - a) Monthly Progress Schedules with Narrative Report shall be submitted at the last Progress Meeting of the month.
 - b) Indicates deviations from the Baseline Schedule and the preceding Monthly Progress Schedule and/or Recovery Schedule as applicable with Narrative Report. The narrative report should include, but not limited to, logic changes, added/deleted activities and justification for changes made.
 - 4) Recovery Schedules with Narrative Report:
 - a) Recovery Schedule with Narrative Report is required if the preceding Monthly Progress Schedule with recorded adverse weather exceeds the Baseline Schedule's Milestone dates, date of Substantial Completion, and/or date of Contract Completion by calendar days greater than the recorded adverse weather days.
 - b) Recovery Schedules with Narrative Report shall be submitted before the first Progress Meeting of the month.
 - c) Indicates revisions to a Monthly Progress Schedule to regain contract compliance with Milestone dates, date of Substantial Completion, date of Contract Completion, and deviations from the Baseline Schedule.
 - 5) Two-Week Look-Ahead Report:

- a) The Two-Week Look-Ahead Report shall be submitted at least 24 hours prior to Progress Meeting.
- b) Reports the activities of the previous 7 calendar days, approximate percentage of total activity completed to date, and manpower loading-by-trade; activities anticipated in the succeeding 7 calendar days; and activities in the succeeding 7 calendar days thereafter. Two-Week Look-Ahead Report activities are to correlate to activities within the construction schedule, including additional detail as necessary.

1.7 COORDINATION OF AS-BUILT DRAWINGS

- A. The Contractor shall maintain in good order at a secure location on the Site:
 - 1) One set of conformed drawings and specifications provided by the AE to be used as the official as-built set for the duration of the project.
- B. Before submitting each Contractor Payment Request, the Contractor shall record all changes on the as-built drawings, neatly in a contrasting color, noting new information not shown on the original Contract Documents including actual installation where installation varies from Work as originally shown, including the exact location and depth of underground utility lines. Failure to record all changes may cause payment to be withheld or delayed.
- C. The Contractor shall keep a record of changes made to the Specifications, noting particularly any approved variation from manufacturers' installation instructions and recommendations.
- D. The Contractor shall at all times permit access to the documents to authorized representatives of the State, local authorities having jurisdiction, Owner, and A/E.
- E. The Contractor, as a condition precedent to final payment, shall organize the As-Built Documents into manageable sets and deliver the As-Built Documents to the A/E. By submitting the As-Built Documents to the A/E, the Contractor certifies that its As-Built Documents are complete, correct, and accurate

1.8 REQUESTS FOR INFORMATION (RFIs)

- A. Prior to Bidding
 - 1) If a contractor preparing bids for submission on the Work is in doubt as to the acceptability of a manufacturer's materials or equipment, under the requirements as set forth in the Specifications, he shall require that representatives of the proposed manufacturer or supplier contact the Architect and request a ruling on the acceptability of the material or equipment in question.

- 2) It is not possible to set the time allowance for the resolution of every problem, however, the time allowed shall **not be less than five (5) days prior to bid opening**. Each party requesting a ruling under this item shall be responsible for the proper evaluation of the time involved and shall submit his request in ample time, as determined by the Architect, to process the request.
- B. After Issuance of Notice to Proceed: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI to the AE.
- 1) Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
 - 2) Present RFIs in a clear question or request and not in multiples to avoid delays or confusion with response.
 - 3) If a recommendation is provided, indicate within RFI if accepting said recommendation would incur a cost or time impact to the project. If no cost or time impact is listed with the recommendation, it is assumed by the AE that said recommendation would be a zero cost/time impact to the project and no change order will be granted to accept the recommendation.
- C. Content of the RFI: Include a detailed, legible description of item needing information or interpretation. RFIs shall include pertinent information listed below. RFI's that in the Architect's judgement contain insufficient information will be returned to Contractor for completion. Time for Architect's response will not begin until a complete RFI is received.
- 1) Project name.
 - 2) Project number.
 - 3) Date.
 - 4) Name of Contractor.
 - 5) Name of Architect.
 - 6) RFI number, numbered sequentially.
 - 7) RFI subject.
 - 8) Specification Section number and title and related paragraphs, as appropriate.
 - 9) Drawing number and detail references, as appropriate.
 - 10) Field dimensions and conditions, as appropriate.

- 11) Contractor's suggested resolution. If Contractor's suggested resolution affects the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 - 12) Contractor's signature.
 - 13) Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a) Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- D. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow 3 working days for Architect's response for each RFI. RFIs received by Architect after 1 p.m. will be considered as received the following working day.
- 1) Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 - 2) Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal.
 - a) If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect in writing within 10 days of receipt of the RFI response.
 - 3) On receipt of Architect's action, immediately distribute the RFI response to affected parties. Review response and notify Architect within 7 days if Contractor disagrees with response.

1.9 SUBSTITUTION PROCEDURES

- A. Substitutions shall be considered changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
- 1) Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - a) Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.

- b) Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - [1] Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - [2] Substitution request is fully documented and properly submitted.
 - [3] Requested substitution will not adversely affect Contractor's construction schedule.
 - [4] Requested substitution has received necessary approvals of authorities having jurisdiction.
 - [5] Requested substitution is compatible with other portions of the Work.
 - [6] Requested substitution has been coordinated with other portions of the Work.
 - [7] Requested substitution provides specified warranty.
 - [8] If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- 2) Substitutions for Convenience: Changes proposed by Contractor that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.
 - a) Prior to Bidding
 - [1] Submit requests for substitution **no less than five (5) days prior to bid opening**. Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the substitution is approved, contractors will be notified via official addendum process.
 - [a] Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - [b] Substitution request is fully documented and properly submitted.

- [c] Requested substitution will not adversely affect Contractor's construction schedule.
- [d] Requested substitution has received necessary approvals of authorities having jurisdiction.
- [e] Requested substitution is compatible with other portions of the Work.
- [f] Requested substitution has been coordinated with other portions of the Work.
- [g] Requested substitution provides specified warranty.
- [h] If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

b) After Issuance of Notice to Proceed

- [1] Not allowed

B. Substitution Requests

- 1) Identify product or fabrication or installation method to be replaced. Include Specification Section number with title and Drawing numbers with titles.
- 2) Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests if recommended by manufacturers.
- 3) Show compliance with requirements for substitutions and the following, as applicable:
 - a) Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
 - b) Coordination information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors, that will be necessary to accommodate proposed substitution.
 - c) Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific

features and requirements indicated. Indicate deviations, if any, from the Work specified.

- d) Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e) Samples, where applicable or requested.
 - f) Certificates and qualification data, where applicable or requested.
 - g) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
 - h) Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
 - i) Research reports evidencing compliance with building code in effect for Project.
 - j) Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - k) Cost information, including a proposal of change, if any, in the Contract Sum.
 - l) Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
 - m) Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
- 4) Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify the Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a) Forms of Acceptance: Submittal Approval, Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.

- b) Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.10 CHANGE ORDER PROCEDURES

- A. Subject to the limitations stated in Contract Documents, a change in the work may be accomplished by a Change Order, Change Directive, or order for a minor change in the Work.
- B. The Contractor shall not proceed with any change in the work without the prior authorization from the AE.
- C. In the event of an emergency affecting the safety of the Project, other property, or individuals, the Contractor, without special instruction or authorization, shall act to prevent the threatened damage, injury, or loss.
 - 1) If the Contractor believes that it is entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of its actions in response to an emergency, the Contractor may request a Modification by giving written notice to the AE.
- D. Except as provided in emergency situations, the Contractor's failure to obtain prior written authorization for a change in the work constitutes a waiver by the Contractor of an adjustment to the Contract Sum or Contract Times, or both, for the related work.
- E. The Contractor shall perform all changes in the work under the applicable provisions of the Contract Documents, and the Contractor shall proceed promptly with the change unless otherwise provided in the Change Order, Change Directive, or order for a minor change in the Work
- F. Change Order Procedures
 - 1) The A/E shall prepare and issue a Proposal Request to the Contractor to obtain the Contractor's Proposal for the adjustment of the Contract Sum or the Contract Times, or both, associated with a contemplated Modification.
 - 2) The Contractor shall respond with a Proposal to the A/E within 14 days after receiving the Proposal Request. The allowable time for the Contractor's response may be extended by written agreement of the Contractor and A/E.
 - 3) The Contractor shall hold the Proposal valid and open for acceptance for at least 45 days or as specified in the contractor's contract. The acceptance period may be adjusted by mutual consent of the Contractor and Contracting Authority.

- 4) A Proposal may be accepted by the Contracting Authority only through a Change Order. A Proposal Request does not authorize the Contractor to proceed with a change in the Work.
- 5) If the Contractor does not timely submit a Proposal within the time required in this section, the Contractor waives its right to an adjustment to the Contract Sum or Contract Times, or both, associated with the contemplated change in the Work.
- 6) If the Contractor's proposal is accepted by the AE and the Owner, the A/E shall prepare each Change Order form, attach the supporting documentation, and issue the Change Order for signature.

G. Change Directives

- 1) If a change in the Work must start immediately to avoid an imminent impact to the schedule of the Project, the A/E may prepare a Change Directive for the Contractors and the Owner's signatures authorizing the Contractor to proceed.
 - a) Upon receipt of a Change Directive, the Contractor shall promptly proceed with the change in the Work involved.
 - b) If the Change Directive is performed on a time and materials basis, the Contractor shall submit its cost/time documentation within seven days after completing the Work. Thereafter, the A/E shall prepare an associated Change Order.

H. Minor Changes In The Work

- 1) The A/E may order minor changes in the Work not involving adjustment of the Contract Sum or extension of the Contract Times and not inconsistent with the intent of the Contract Documents. Those changes shall be effected by written order issued to the Contractor.
- 2) The Contractor shall promptly carry out each order for a minor change in the Work if the Contractor agrees that the order does not involve adjustment of the Contract Sum or Contract Times, or both.
- 3) If the Contractor reasonably believes that it would be entitled to an adjustment of the Contract Sum or Contract Times, or both, on account of an order for a minor change in the work, the Contractor, within three business days after receiving the order, shall give the A/E written notice of the Contractor's position, and not proceed with the subject work without first receiving a Change Directive or Change Order related to it.
- 4) The Contractor waives its right to an adjustment of the Contract Sum or Contract Times on account of an order for a minor change in the Work by:

- a) Starting the Work that is the subject of the order for a minor change in the Work; or
- b) Failing to give the notice described under Section 3) within three business days after receiving the order for a minor change in the Work.

I. Differing Site Condition

- 1) If the Contractor encounters a Differing Site Condition, the Contractor shall stop work on that Differing Site Condition and give immediate written notice of the condition to the A/E.
 - a) The Contractor's failure to give notice of the Differing Site Condition as required under this section shall constitute an irrevocable waiver of any associated Claim.
- 2) Promptly after receiving notice from the Contractor of a Differing Site Condition, the A/E shall investigate to determine whether the Contractor has encountered a Differing Site Condition. The A/E shall give written notice of its determination to the Owner and Contractor within ten days after completing the investigation.
 - a) If the A/E determines that the Contractor has encountered a Differing Site Condition, the A/E shall process an appropriate Change Order.
 - b) If the A/E determines that the Contractor has not encountered a Differing Site Condition and the Contractor does not agree with that determination, the Contractor must initiate a Claim under the terms of the contract within ten days after the date that the A/E issues its determination.

1.11 SUBMITTAL PROCEDURES

- A. Submittals schedule is due prior to submittal of first progress payment request.
- B. Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1) Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2) Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.

- 3) The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Should special circumstances exist which would prevent the prompt and timely submission of a submittal, notify the AE in writing in sufficient time to avoid negative impact on the project schedule.
- D. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal to the Architect using a transmittal form. Submittals received from sources other than the General Contractor will be returned without action.
 - 1) On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.
- E. Review time: Allow fourteen (14) days for the AE's initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
 - 1) The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked to indicate the action taken.
- F. Resubmission Requirements
 - 1) Make required changes and corrections and resubmit until accepted.
 - 2) Indicate changes made by circling of the affected area and a revision mark.
 - 3) Resubmit in accordance with requirements for original submittal.
 - 4) Resubmit new samples when requested by the AE.
 - 5) The Contractor shall pay all reasonable costs of the Architect and Owner for any and all delay, interference, hindrance or disruption of the Project due to excessive re-submittals not the fault of the Architect or Owner.

1.12 PROJECT MEETINGS

- A. Preconstruction Conference: Architect and Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days before the start of construction.
 - 1) Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference.

Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2) Agenda: Discuss items of significance that could affect progress, including but not limited to the following:

- a) Responsibilities and personnel assignments.
- b) Tentative construction schedule.
- c) Phasing.
- d) Critical work sequencing and long lead items.
- e) Designation of key personnel and their duties.
- f) Lines of communications.
- g) Procedures for processing field decisions and Change Orders.
- h) Procedures for RFIs.
- i) Procedures for testing and inspecting.
- j) Procedures for processing Applications for Payment.
- k) Distribution of the Contract Documents.
- l) Submittal procedures.
- m) Preparation of Record Documents.
- n) Use of the premises.
- o) Work restrictions.
- p) Working hours.
- q) Owner's occupancy requirements.
- r) Responsibility for temporary facilities and controls.
- s) Procedures for moisture and mold control.
- t) Procedures for disruptions and shutdowns.
- u) Parking availability.
- v) Office, work, and storage areas.

- w) Equipment deliveries and priorities.
 - x) First aid.
 - y) Security.
 - z) Progress cleaning.
- B. Preinstallation Conferences: Contractor shall conduct a preinstallation conference at Project site before each construction activity when required by other sections and when required for coordination with other construction.
- 1) Attendees: Authorized representatives of Owner, Contractor, Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect/Owner of scheduled meeting dates.
 - 2) Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a) Contract Documents.
 - b) Options.
 - c) Related RFIs.
 - d) Related Change Orders.
 - e) Purchases.
 - f) Deliveries.
 - g) Submittals.
 - h) Review of mockups.
 - i) Possible conflicts.
 - j) Compatibility requirements.
 - k) Time schedules.
 - l) Weather limitations.
 - m) Manufacturer's written instructions.
 - n) Warranty requirements.

- o) Compatibility of materials.
 - p) Acceptability of substrates.
 - q) Temporary facilities and controls.
 - r) Space and access limitations.
 - s) Regulations of authorities having jurisdiction.
 - t) Testing and inspecting requirements.
 - u) Installation procedures.
 - v) Coordination with other work.
 - w) Required performance results.
 - x) Protection of adjacent work.
 - y) Protection of construction and personnel.
 - z) Protection of completed work
 - 3) Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4) Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5) Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- C. Progress Meetings: Conduct progress meetings at weekly intervals.
- 1) Coordinate dates of meetings with preparation of payment requests.
 - 2) Attendees: In addition to representatives of Owner and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - a) Regular scheduled meetings with the Owner, Architect, and General Contractor should be focused on project updates, major issues, and owner input.

- 3) Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a) Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - [1] Review schedule for next period.
 - [2] Provide minimum 2 week look ahead schedule as required per section 1.6.
 - b) Review present and future needs of each entity present, including the following:
 - [1] Interface requirements.
 - [2] Sequence of operations.
 - [3] Status of submittals.
 - [4] Deliveries.
 - [5] Off-site fabrication.
 - [6] Access.
 - [7] Site use.
 - [8] Temporary facilities and controls.
 - [9] Progress cleaning.
 - [10] Quality and work standards.
 - [11] Status of correction of deficient items.
 - [12] Field observations.
 - [13] Status of RFIs.
 - [14] Status of Proposal Requests.
 - [15] Pending changes.

[16] Status of Change Orders.

[17] Pending claims and disputes.

[18] Documentation of information for payment requests.

4) Minutes: AE shall record and distribute the meeting minutes to each party present and to parties requiring information following the meeting date.

a) Schedule Updating: Contractor to revise construction schedule after each progress meeting where revisions to the schedule have been made or recognized and issued revised schedule per section 1.6.

D. Project Closeout Conference: Schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than 90 days prior to the scheduled date of Substantial Completion.

1) Conduct the conference to review requirements and responsibilities related to Project closeout.

2) Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.

3) Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

a) Preparation of record documents.

b) Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.

c) Requirements for final written warranties and service response.

d) Requirements for preparing operations and maintenance data.

e) Requirements for delivery of material samples, attic stock, and spare parts.

f) Requirements for demonstration and training.

g) Preparation of Contractor's punch list.

h) Procedures for processing Applications for Payment at Substantial Completion and for final payment.

i) Submittal procedures.

- j) Owner's partial occupancy requirements.
- k) Installation of Owner's furniture, fixtures, and equipment.
- l) Responsibility for removing temporary facilities and controls.
- 4) Minutes: AE will record and distribute meeting minutes.

2. PART 2 - PRODUCTS (Not Used)

3. PART 3 - EXECUTION (Not Used)

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes Preliminary Construction Schedule, Baseline Schedule, Monthly Progress Schedules, and Recovery Schedules.
 - 1) For clarity, this Section uses the term Schedule Manager for activities performed by the Contractor (General Contracting).
 - 2) In its Base Bid, the Contractor shall include providing scheduling services to meet these requirements.
- B. Accepted Schedules will be used to plan organize, and execute the work, to measure the progress of the work, to coordinate and complete remaining work, to aid in evaluating time extensions, and to provide the basis for all progress payments.
- C. Failure to maintain Schedules in a contract compliant status may result in the Contracting Authority withholding payment until the schedule is accepted in accordance with General Conditions.
- D. Related Sections:
 - 1) 01 78 00 Project Closeout and Warranties

1.2 SUBMITTALS

- A. 90-Day Preliminary Schedule with Narrative Report: Defines the Contractor's planned operations for the first 90 calendar days and shall be submitted for acceptance within 30 calendar days after the Notice to Proceed is issued.
- B. Baseline Schedule with Narrative Report: Defines the Contractor's planned operations for the duration of the contract to completion, issuance of the Certificate of Substantial Completion and shall be submitted for acceptance within 90 calendar days after the Notice to Proceed is issued.
- C. Monthly Progress Schedules with Narrative Report: Indicates deviations from the Baseline Schedule and the preceding Monthly Progress Schedule and/or Recovery Schedule as applicable with Narrative Report. The narrative report should include, but not limited to, logic changes, added/deleted activities and justification for changes made. Monthly Progress Schedules with Narrative Report shall be submitted at the last Progress Meeting of the month.
- D. Recovery Schedules with Narrative Report: Indicates revisions to a Monthly Progress Schedule to regain contract compliance with Milestone dates, date of Substantial Completion, date of Contract Completion, and deviations from the Baseline Schedule. Recovery Schedules with Narrative Report shall be submitted before the first Progress Meeting of the month. Recovery Schedule with Narrative Report is required if the preceding Monthly Progress Schedule with recorded adverse weather exceeds the Baseline Schedule's Milestone dates, date of Substantial Completion, and/or date of Contract Completion by calendar days greater than the recorded adverse weather days.

- E. Two-Week Look-Ahead Report: Reports the activities of the previous 7 calendar days, approximate percentage of total activity completed to date, and manpower loading-by-trade; activities anticipated in the succeeding 7 calendar days; and activities in the succeeding 7 calendar days thereafter. The Two-Week Look-Ahead Report shall be submitted at each Progress Meeting. Two-Week Look-Ahead Report activities are to correlate to activities within the construction schedule, including additional detail as necessary.
- F. Schedule submittals are to be submitted as a PDF for reference.

1.3 SCHEDULE KICK-OFF MEETING

- A. The purpose of the Schedule Kick-Off Meeting is to review the contract requirements for construction scheduling including, but not limited to:
 - 1) Applicable delivery method template
 - 2) Project calendars
 - 3) Project Level Activity Codes
 - 4) Minimum WBS breakdown
 - 5) Anticipated project work sequence
 - 6) Submission methodologies

2. PART 2 – PRODUCTS (NOT USED)

3. PART 3 - EXECUTION

3.1 CRITICAL PATH METHOD

- A. The Critical Path Method (CPM) of network calculations will be used to generate the schedule. The Schedule Manager shall provide project schedules (Preliminary, Baseline, Progress Updates, Recovery, etc.) in .PDF for reference. Note: The required formatting may be waived by the Project Manager if the Contractor's proposed alternate formatting is supported by exceptional circumstances, i.e., short contract duration (less than six months) with a single trade.

3.2 SCHEDULE STRUCTURE

- A. With the exception of the Preliminary Schedule submission, the Construction Schedule shall include an appropriate level of detail. Failure of the Schedule Manager to develop or update the schedule or provide resource information will result in the schedule not being accepted.
 - 1) Provide a standard project calendar working day schedule that shows the various activities of work in sufficient detail to demonstrate a reasonable and workable plan to complete the work per the contract. Show the order and interdependence of activities and the sequence for accomplishing the work. Describe all activities in sufficient detail so that the Contracting Authority can readily identify the work and measure the progress of each activity. The Baseline Schedule must reflect the scope of work, required phasing, Owner requirements, Owner activities as predecessors to Contractor activities, interim Milestone completion dates (as

needed), Substantial Completion Finish on or Before Milestone, the Contract Completion Finish on or Before Milestone, and other project milestones established in the Contract Documents. Include activities for critical project submittals, working drawings, shop drawing preparation, review and approval time for submittals and shop drawings, material procurement and fabrication, and the delivery of materials, plant, and equipment, and other similar activities.

- 2) The Contractor shall be responsible for assuring all work, including all subcontractor work, is included in the Baseline Schedule. The Contractor shall be responsible for assuring that all work sequences are logical and that the schedule indicates a coordinated plan.
- 3) Failure by the Contractor to include any element of work required for performance of the Contract shall not excuse the Contractor from completing all work within the required time. The Contracting Authority's review of the baseline schedule will be for compliance with the specifications and contract requirements. Acceptance by the Contracting Authority will not relieve the Contractor of any of their responsibilities for the accuracy or feasibility of the schedule. Omissions and errors will be corrected as described in Section F or I in this note and will not affect contract time.

B. Activity Durations:

- 1) Submit the following data to support the standard project calendar as it relates to durations. Failure of the Schedule Manager to include this data will delay the review of the submittal until the Contracting Authority receives the missing data.
 - a) The proposed number of working days per week
 - b) The holidays to be observed during the life of the contract (by day, month, and year)
 - c) Exception dates set aside by the Owner as non-working days
 - d) The planned number of shifts per day
 - e) Break up the work into activities of a duration no longer than 20 workdays each, except as to non-construction activities (e.g., procurement of materials, delivery of equipment, concrete and asphalt curing) and any other activities for which the contracting Authority may approve a longer duration.
 - f) Activity durations will be in whole days, do not include decimals in the duration. Do not represent the Owner requirements, erosion control, and other similar items as single activities extending to the Substantial Completion date. Break these Contract Items into component activities.

C. Activity Logic:

- 1) All activities, except the first activity, shall have a predecessor(s). All activities, except the final activity, shall have a successor(s).
- 2) Use only finish to start relationships with no leads or lags to link activities or using start to start relationships with lags no greater than the predecessor duration to link activities.
- 3) Use of finish-to-finish relationships is permitted when both activities are already lined with a start to start relationship.

D. Procurement Activities:

- 1) Prepare the schedule in chronological order of critical submittals. Show specification section of the submittal, name of Contractor and generic description of work covered. Include activities to cover the complete procurement process to include submittal, review, approval, resubmittal, re-review, procurement, fabrication, delivery, permits, and similar pre-construction work.

E. Project Level Resources:

- 1) Activities shall include a primary resource of estimated budgeted units indicating man hours associated with each activity.
- 2) Identification of manpower, material, or equipment restrictions, as well as any activity requiring unusual shift work, such as two shifts per day, six-day work week, specified overtime, or work at times other than regular days or hours shall clearly be identified in the Project Schedule as needed.
- 3) Critical or near Critical Paths resulting from the use of manpower or equipment restraints shall be kept to a minimum. Near Critical Paths are defined as paths having 10 workdays or less of total float.

F. Project Level Activity Codes:

- 1) All activities shall be assigned, at a minimum, the following Project Level Activity Codes.
 - a) Responsibility indicating the party responsible to perform the work. Responsibility includes, but is not limited to, the contracting firm, the subcontracting firm, Contractor workforce or Agency performing a given task. Activities shall not belong to more than one responsible party.
 - b) Weather Dependent (Type 1, Type 2, or None)
 - c) Off hour work or unique shifting requirements

G. Project Level Calendars:

- 1) Only project level calendars are to be utilized. All project level calendars are to be set with the detailed work hours/day calculating from 8 am-5 pm, with the noon hour break for lunch and shall inherit no exceptions or holidays from global calendars. The project level calendar names shall be utilized to identify specific planned work hours on site (4'10s, 5D, 6D, etc.) The contracting authority monitors progress on 1-day duration basis, it is the responsibility of the Contractor to execute the hours/resources needed to accomplish an activity in a given 1-day duration. No global data of any kind (codes, calendars, etc.) is to be used.

H. Activity Default Settings:

- 1) An activity should have the below default activity settings. Any variances must be approved by the Contracting Authority.
 - a) Activity Type: Task Dependent
 - b) Duration Type: Fixed Duration & Units
 - c) % Complete Type: Duration

I. Schedule Group and Sort Organization:

- 1) Arrange the schedule to show each major area of construction for each major category or unit of work by Work Breakdown Structure (WBS) or Project Level Activity Codes. The schedule organization should have a minimum of three levels.
- 2) All activity names shall include a reference to the group and sort associated which is agreed upon during the schedule kick off meeting. Activities shall not be allowed to cover more than one work area.

J. Change Order or Claim Number:

- 1) Any scope revision which modifies the critical path, or impacts an interim date, or Substantial Completion date must be represented in the schedule as a fragnet. A fragnet is defined as a sequence of new activities, to include the associated change identifier (PCO, CO, RFI, etc.), that are proposed to be added to the existing schedule. The fragnet shall identify the predecessors to the new activities and demonstrate the impacts to succeeding activities. The fragnet is to be added to the schedule at the progress update just prior to the known impact.

K. Milestones:

- 1) Milestone dates are defined in calendar days following the date set forth in the Notice to Proceed and are required to be met by the Contractor. Time is of the essence for the completion of Milestones, Substantial Completion date, and for the Contract Completion date.
- 2) The following Milestone dates shall be adhered to by the Contractor:
 - a) January 15, 2026 – Anticipated Notice to Proceed; construction duration begins
 - b) March 31, 2026 – Complete seasonal tree clearing within bat habitat areas
 - c) April 1, 2026 (TBD) – Groundbreaking Ceremony
 - d) October 1, 2026 (TBD) – Topping out Ceremony
 - e) April 2, 2027 – Construction duration for new building to be completed
 - f) April 5, 2027 thru April 30, 2027 – Owner move-in / transfer and start-up activities to be completed within new building
 - g) May 3, 2027 thru May 28, 2027 – Existing building demolition / site restoration
 - h) May 31, 2027 – Substantial completion
 - i) June 1, 2027 – Ribbon cutting

L. Adverse Weather:

- 1) Definitions
 - a) Adverse Weather Day: A day when the magnitude of a weather parameter (precipitation or temperature) is such that it creates conditions that inhibits the ability of the Contractor to work productively on critical construction activities.

- b) Expected Adverse Weather Days: The number of adverse weather days expected to occur on a monthly basis and defined for two different construction types (Type 1: Earth Moving and Type 2: Structures and Surfacing).
- c) Unexpected Adverse Weather Days: The number of adverse days that exceed the expected number of adverse weather days determined on a monthly basis. Also include number of days with lightning and/or high winds that inhibit the ability of the Contractor to work productively on critical construction activities as corroborated by the Contracting Authority. The Contractor is to notify the contracting authority within one month of a weather event.
- d) Actual Adverse Weather Days: The actual number of adverse weather days that occur during a single month.
- e) Precipitation: Rain, snow, or hail where 1" of rain equals 12" of snow.
- f) Calendar Day is based on all available days including weekends and holidays.
- g) Working Day is based on a five-day work week and excludes weekends and legal holidays.

2) Methodology

- a) Adverse Weather Days Criteria
 - [1] A single precipitation threshold of greater than 7.62 mm (0.30 in) determines an adverse weather day for Type 1 and Type 2 construction.
 - [2] A single precipitation threshold of greater than 19.05 mm (0.75 in) the previous day determines an adverse weather day/additional consecutive non-working day for Type 1 construction only.
 - [3] A single precipitation threshold of greater than 7.62 mm (0.30 inch) reached before shut-down determines an adverse weather day for Type 1 and Type 2 construction.
 - [4] A single daily maximum temperature threshold of less than 0 degrees C (32 degrees F) determines an adverse weather day for Type 1 & Type 2 construction.
 - [5] A combination of daily maximum temperature less than 0 degrees C (32 degrees F) and precipitation greater than 7.62 mm (0.30 inch) determines a single adverse weather day.
- b) Expected Adverse Weather Days
 - [1] Calculate the average number of expected adverse weather calendar days per month based on 5 years of data from the nearest National Oceanic and Atmospheric Administration (NOAA) Land-Based Station for each construction type. Data can be found at the NOAA associated National Centers for Environmental Information (NCEI) web site at <https://www.ncei.noaa.gov/>.
 - [2] Calculate the average number of expected adverse workdays per month by multiplying the average number of expected adverse weather calendar days per month by 5/7 and randomly, non-consecutive when possible, distribute the weather days throughout the project level weather calendars.

M. Scheduled Project Completion:

- 1) Project Start Date: The Construction Schedule may start no earlier than the date that the Notice to Proceed (NTP) was issued. The Schedule Manager shall include as the first activity in the Construction Schedule a Start Milestone called "Notice to Proceed." The "Notice to Proceed" activity shall have: a start constraint equal to the date that the NTP was issued.
- 2) Constraint of Last Activity: Completion of the last Finish Milestone in the schedule shall be constrained by the contract completion date. Calculation on project updates shall be such that if the early finish of the last activity falls after the contract completion date, then the float calculation shall reflect a negative float on the Critical Path. The Schedule Manager shall include as the last activity in the Project Schedule an activity called "Contract Complete". The completion milestones activity shall have a: Finish on or Before constraint, a constraint date equal to the Contract Completion milestone identified herein.
- 3) Project Details Must Finish By Date: The Schedule Manager shall set the "project details must finish by schedule date" to be equal to the "Contract Complete" date.

N. Interim Completion Dates (Milestones):

- 1) Contractually specified interim completion dates (Milestone dates) shall also be constrained to show negative float if early finish date of the last activity in that phase falls after the interim completion date.

O. Default Progress Data Disallowed:

- 1) Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM Scheduling Software. Actual Start and Finish dates and Remaining Durations on the CPM Schedule shall match those dates provided from Contractor Daily Reports for every in progress or completed activity and insure that the data contained on the Daily Reports is the sole basis for schedule updating. Failure to comply may result in the disapproval of schedule.

P. Out of Sequence Progress:

- 1) Activities that have posted progress without predecessors being completed (Out of Sequence Progress) shall be retained in the schedule only by the case by case concurrence of the Contracting Authority. The Contracting Authority may direct that changes in schedule logic be made to correct any or all Out of Sequence Work. Schedule must be calculated with the retained logic setting.

Q. Negative Lag(s):

- 1) Lag durations contained in the schedule shall not have a negative value unless approved by the Contracting Authority.

R. Definition of, and Conditions Relating to Float:

- 1) Float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, of any activity in the schedule. Total float is defined as the amount of time any given activity or path of activities may be delayed before it will affect the project completion time.

- 2) Float is not time for the exclusive use or benefit of the Contractor and shall be used in the best interest of completing the project on time.
- 3) Extensions of Contract Times required under the General Conditions pertaining to equitable time adjustment will be granted only to the extent that the equitable time adjustment exceeds total float in the activity or path of activities affected at the time approval was issued for the change.
- 4) Use of float suppression techniques such as preferential sequences, special lead/lag logic restraints, extended activity times, or imposed dates, other than as required by the Contract, shall be cause for rejection of the Construction Schedule and any revisions or updates.

3.3 LAYOUTS / VIEWS

- A. Each submitted schedule shall utilize the below layouts/views as stipulated by the Contracting Authority:
 - 1) Preliminary Schedule Review
 - 2) Baseline Schedule Review
 - 3) Progress Review
 - 4) Progress vs. Baseline Comparison
 - 5) Progress vs. Previous Progress Comparison
 - 6) Progress vs. Previous Progress vs. Baseline Comparison
 - 7) Recovery Schedule vs. Previous Progress Comparison
 - 8) Baseline Finish Date
 - 9) Total Float
 - 10) Actual Start and Actual Finish dates shall be printed for those activities in progress or completed
- B. Activity ID Report: A list of all activities sorted according to Activity ID number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.
- C. Logic Report: A list of preceding and succeeding activities for every activity in ascending order by activity number and then sorted according to Early Start Date. For completed activities the Actual Start Date shall be used as the secondary sort.
- D. Total Float Report: A list of all activities sorted in ascending order of total float. Activities which have the same amount of total float shall be listed in ascending order of Early Start Dates.

3.4 90-DAY PRELIMINARY CONSTRUCTION SCHEDULE

- A. The accepted Preliminary Construction Schedule shall be used for payment purposes and the basis for measuring Contractor progress not to exceed 90 days after Notice to Proceed is issued.

B. Schedule Review and Comments:

- 1) Comments made by the Contracting Authority on the Preliminary Construction Schedule during review shall not relieve the Contractor from compliance with the requirements of the Contract Documents.
- 2) Following the Contractor's receipt of the Contracting Authority's review comments, the Contractor shall correct the schedule to identify missing activities and relationships relevant to the Scope of Work. No time extensions will be granted to complete activities not initially included in the Contractor's Preliminary Construction Schedule.
- 3) To the extent that there are any conflicts between the accepted Preliminary Construction Schedule and the requirements of the Contract Documents, the Contract Documents shall govern.

C. Resubmittal of Preliminary Construction Schedule:

- 1) Should the Contracting Authority reject the Preliminary Construction Schedule, the Schedule Manager shall comply with the Contracting Authority's direction and resubmit the Preliminary Construction Schedule and all associated submittals within seven calendar days.

3.5 BASELINE CONSTRUCTION SCHEDULE

- A. The Contracting Authority shall accept or reject, in writing, the Baseline Construction Schedule and the associated submittals. If the Baseline Construction Schedule is rejected, the Contracting Authority shall provide comments in writing to the Schedule Manager stating the reasons why the submission was not accepted.
- B. Acceptance of the baseline schedule does not revise the Contract Documents. The baseline schedule must be "accepted" or "accepted as noted" by the Contracting Authority prior to the Contracting Authority evaluating any Contractor claims associated with time impacts.

3.6 MONTHLY PROGRESS SCHEDULES

A. Construction Contract Adjustment for Unexpected Adverse Weather:

- 1) Contract adjustment is justified when the number of actual adverse weather workdays exceeds the expected number of adverse weather workdays over the life of the project.
- 2) The number of actual adverse weather workdays as reported at the nearest NOAA Land-Based Station and related construction task(s) are to be reported on a monthly basis at the last Progress Meeting of the month as a condition of Payment Application approval.
- 3) The Contracting Authority is to verify with documentation the actual adverse weather workdays reported by the Contractor.
- 4) Execution: At the first Progress Meeting of each month the total number of actual adverse weather days is compared to the expected number of adverse weather days and reported by the Contracting Authority. If the number of actual adverse weather days exceeds the expected amount, then the difference is the potential

days for extensions of the Contract Times due to weather. A running total will be kept for every month of the entire project. Once the project Substantial Completion date is reached, or the number of working days is completed, the Contactor may request that any net positive adverse weather days for the running total be awarded as a time extension.

3.7 DATA SUBMISSION

- A. The preliminary, baseline, progress, and recovery Construction Schedules shall be provided in the form of a .XML file prepared in Oracle's Primavera P6 software.

Table 1 – Schedule Filename Convention			
Schedule	1st Submission	2nd Submission	3rd Submission
Preliminary Schedule	YY.MM.DD_PPP-000000_01PS	YY.MM.DD_PPP-000000_02PS	YY.MM.DD_PPP-000000_03PS
Baseline Schedule	YY.MM.DD_PPP-000000_01B	YY.MM.DD_PPP-000000_02B	YY.MM.DD_PPP-000000_03B
Progress Schedule #1	YY.MM.DD_PPP-000000_01SU01	YY.MM.DD_PPP-000000_02SU01	YY.MM.DD_PPP-000000_03SU01
Progress Schedule #2	YY.MM.DD_PPP-000000_01SU02	YY.MM.DD_PPP-000000_02SU02	YY.MM.DD_PPP-000000_03SU02
Delay Analysis	YY.MM.DD_PPP-000000_01TIA01	YY.MM.DD_PPP-000000_02TIA01	YY.MM.DD_PPP-000000_03TIA01
Weather Delay Analysis	YY.MM.DD_PPP-000000_01WD01	YY.MM.DD_PPP-000000_02WD01	YY.MM.DD_PPP-000000_03WD01
Recovery Schedule	YY.MM.DD_PPP-000000_01RS01	YY.MM.DD_PPP-000000_02RS01	YY.MM.DD_PPP-000000_P03RS01
YY – Project Year MM – Month DD – Day PPP-000000 – Project Number			

3.8 APPROVED CHANGES VERIFICATION

- A. Only Construction Schedule changes that have been previously accepted by the Contracting Authority shall be included in the schedule submission. The narrative report shall specifically reference, on an activity-by-activity basis, all changes made since the previous period and relate each change to documented, accepted schedule changes.
- B. The Contractor shall prosecute the work in accordance with the accepted Construction Schedule. Out of sequence construction, defined as a change from the Construction Schedule in the Contractor's actual operation requires prior concurrence from the Contracting Authority.
- C. Upon the approval of a Change Order or the issuance of a Change Directive by the Contracting Authority, the agreed upon change order activities, activity durations, logic and impacts shall be reflected in the next schedule submittal by the Schedule Manager.

- D. No change to the accepted activities, original activity durations, logic, interdependencies, milestones, planned sequence of operations, or resource loading of the Construction Schedule shall be made without prior approval from the Contracting Authority. If the Contractor desires to make a change to the accepted Construction Schedule, the Contractor shall outline the revisions made within the updated narrative, stating the reasons for the change as well as the specifics, such as the proposed changes in activities, original activity durations, logic, interdependencies, milestones, planned sequence of operations, or resource loading of the baseline Construction Schedule. The Contracting Authority shall respond within three calendar days after the receipt of the Contractor's request.
- E. If the Contracting Authority considers the Construction Schedule change requested by the Contractor to be a major change, it may require the Contractor to revise and submit for acceptance, without additional cost to the Owner, all of the affected portions of the network diagrams, and any schedule reports, or construction equipment reports deemed necessary to show the probable effect on the entire project. The proposed network revision and required reports shall be submitted to the Contracting Authority within seven calendar days after the Contracting Authority notifies the Contractor that the requested revision is a major change. Only upon the approval of the requested change by the Contracting Authority may it be reflected in the next Construction Schedule update submitted by the Contractor.
- F. A change will be considered of a major nature if the time estimated for an activity or sequence of activities is varied from the original plan to the degree that there is reasonable doubt that the Substantial Completion date, Contract Completion date, or milestones will be met, or if the change impacts the work of Separate Contractors at the job site. Changes to activities having adequate float may be considered as minor changes, except that an accumulation of minor changes may be considered a major change when such changes affect the Substantial Completion date, Contract Completion date, or milestones.

END OF SECTION

SECTION 01 33 00
SUBMITTAL PROCEDURES

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and provisions of the Contract, including General and Supplementary Conditions and other Division 1 sections, apply to this section.

1.2 SUMMARY

- A. This section specifies administrative and procedural requirements for submittals required for performance of the work, including:
 - 1) Contractor's construction schedule
 - 2) Submittal schedule
 - 3) Shop drawings
 - 4) Product data
 - 5) Samples
- B. Submittals schedule is due prior to submittal of first progress payment request.

1.3 SUBMITTAL PROCEDURES

- A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.
 - 1) Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 - 2) Coordinate transmittal of different types of submittals for related elements of the work so processing will not be delayed by the need to review submittals concurrently for coordination.
 - 3) The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- B. Should special circumstances exist which would prevent the prompt and timely submission of a submittal, notify the General Contractor in writing in sufficient time to avoid negative impact on the project schedule.
- C. Review time: Allow fourteen (14) days for the General Contractor's initial review and forwarding to the Architect. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect will promptly advise the Contractor when a submittal being processed must be

delayed for coordination. The Architect shall review and take appropriate action on the submittal within fourteen (14) days of receipt from the General Contractor.

- 1) No extension of contract time will be authorized because of failure to transmit submittals to the General Contractor sufficiently in advance of the work to permit processing.
- D. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.
- 1) Provide a space on the label or beside the title block on shop drawings to record the Contractor's review and approval markings and the action taken.
 - 2) Include the following information on the label for processing and recording action taken.
 - a) Project name
 - b) Date
 - c) Name and address of subcontractor
 - d) Name and address of supplier
 - e) Name of manufacturer
 - f) Number and title of appropriate specification section
- E. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal to the Architect using a transmittal form. Submittals received from sources other than the General Contractor will be returned without action.
- 1) On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including minor variations and limitations.

1.4 SHOP DRAWINGS

- A. Submit newly prepared information, drawn to accurate scale. Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of shop drawings. Standard information prepared without specific reference to the project is not considered shop drawings.
- B. Shop drawings include fabrication and installation drawings, setting diagrams, schedules, patterns, templates and similar drawings.

- 1) One of the prints returned shall be marked-up and maintained as a "Record Document".
- 2) Do not use shop drawings without an appropriate final stamp indicating action taken in connection with construction.

1.5 PRODUCT DATA

- A. Collect Product Data into a single submittal for each element of construction or system. Product Data includes printed information such as manufacturer's installation instructions, catalog cuts, standard color charts, roughing-in diagrams and templates, standard wiring diagrams and performance curves. Where Product Data must be specially prepared because standard printed data is not suitable for use, submit as "shop drawings".
- B. Mark each copy to show applicable choices and options. Where printed Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information. Include the following information:
 - 1) Manufacturer's printed recommendations.
 - 2) Compliance with recognized trade association standards.
 - 3) Compliance with recognized testing agency standards.
 - 4) Application of testing agency labels and seals.
 - 5) Notation of dimensions verified by field measurement.
 - 6) Notation of coordination requirements.
- C. Do not submit Product Data until compliance with requirements of the Contract Documents has been confirmed.

1.6 SAMPLES

- A. Submit full-size, fully fabricated samples cured and finished as specified and physically identical with the material or product proposed. Samples include partial sections of manufactured or fabricated components, cuts or containers of material, color range sets, and swatches showing color, texture, and pattern.
- B. Mount, display, or package samples in the manner specified to facilitate review of qualities indicated. Prepare samples to match the Architect's sample. Include the following:
 - 1) Generic description of the sample.
 - 2) Sample source.

- 3) Product name or name of manufacturer.
 - 4) Compliance with recognized standards.
 - 5) Availability and delivery time.
- C. Submit samples for review of kind, color, pattern, and texture, for a final check of these characteristics with other elements, and for a comparison of these characteristics between the final submittal and the actual component as delivered and installed.
- 1) Where variation in color, pattern, texture, or other characteristics are inherent in the material or product represented, submit multiple units (no less than 3), that show approximate limits of the variations.
 - 2) Preliminary submittals will be reviewed and returned with the Architect's mark indicating selection and other action.
- D. Number of Submittals: Except for samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit two (2) sets; one will be returned marked with the action taken.
- E. Maintain sets of samples, as returned, at the project site, for quality comparisons throughout the course of construction.
- 1) Unless noncompliance with Contract Document revisions is observed, the submittal may serve as the final submittal.
 - 2) Sample sets may be used to obtain final acceptance of the construction associated with each set.
- F. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the work. Show distribution on transmittal forms.
- G. Field samples specified in individual sections are special types of samples. Field samples are full-size examples erected onsite to illustrate finishes, coatings, or finish materials and to establish the standard by which the work will be judged.

1.7 PROOF OF QUALIFICATION

- A. Qualifications submitted shall include additional documentation as requested by architect/engineer or as listed within individual specification divisions.

1.8 PREINSTALL MEETING

- 1) Preinstall meetings shall include additional meetings as requested by architect/engineer or as listed within individual specification divisions.

1.9 ARCHITECT'S ACTION

- A. Except for submittals for record, information or similar purposes, where action and return is required or requested, the Architect will review each submittal, mark to indicate action taken, and return promptly.
 - 1) Compliance with specified characteristics is the Contractor's responsibility.
- B. Action Stamp: The Architect will stamp each submittal with a uniform, self-explanatory action stamp. The stamp will be appropriately marked to indicate the action taken.

1.10 RESUBMISSION REQUIREMENTS

- A. Make required changes and corrections and resubmit until accepted.
- B. Indicate changes made by circling of the affected area and a revision mark.
- C. Resubmit in accordance with requirements for original submittal.
- D. Resubmit new samples when requested by the Construction Manager.
- E. The Contractor shall pay all reasonable costs of the Architect, Owner and the Construction Manager for any and all delay, interference, hindrance or disruption of the Project due to excessive re-submittals not the fault of the Architect, Owner and or the Construction Manager.

2. PART 2 - PRODUCT (Not Used).

3. PART 3 - EXECUTION (Not Used).

END OF SECTION

1. PART 1 - GENERAL

1.1 DESCRIPTION

- A. The contractor shall be responsible for all quality control associated with the project. Periodic oversight by the Associate Architect, other authorized personnel, to include submittal approvals, in no way relieves the contractor of this responsibility.
- B. All testing shall be divided into three (3) categories as follows:
 - (1) Field tests made at the project site as part of the actual construction.
 - (2) Factory tests made at the point of manufacture of various products which are shipped to the project site as a unit.
 - (3) Certified tests made by approved testing agencies on material and/or equipment which is to be incorporated into the project. This type of testing includes that performed by Factory Mutual, Underwriters' Laboratories, etc.

1.2 FIELD TESTING

- A. The contractor shall perform all field testing required of him by the contract documents and all field tests required by the applicable publications referenced in the contract documents.
- B. The contractor shall furnish all equipment, instruments, facilities, and qualified personnel, and shall bear all costs for required testing.
- C. All laboratory work performed under this contract shall be by an approved laboratory. Specifically, laboratories performing work in connection with concrete, steel, and bituminous materials must conform to American Society of Testing and Materials (ASTM) Designation E329. Laboratories performing work not in connection with concrete, steel, and bituminous materials must conform to Section 3 & 4 of ASTM E329.
- D. All test reports shall be certified by a Professional Engineer registered in the State of Ohio. Test reports shall include:
 - (1) Acceptable value for each specification item.
 - (2) Actual test result obtained.
 - (3) Test method(s) used.
 - (4) Statement that product conforms (or does not conform) to the specification requirements.

- E. Original copies of all test reports shall be submitted to the Associate Architect directly by the laboratory.
- F. Sampling and testing shall be repeated as required to insure the in-place product meets all specifications. All samples and tests producing unacceptable results shall be the responsibility of the contractor and shall not result in any additional cost to the Owner.

1.3 FACTORY AND CERTIFIED TESTING

- A. Certified tests on materials to be incorporated into the project will be acceptable provided the following provisions are met:
 - (1) Testing must be performed by the manufacturer, or a national organization, or approved testing laboratory.
 - (2) Certified tests must assure full compliance with the contract specifications.
 - (3) An original certification naming the item to be certified, and naming the material specification standard, or other document controlling the quality of the item shall be provided. Test results showing compliance with the named specification, standard or document will be attached.

1.4 SPECIAL INSPECTIONS

- A. Special inspections as listed in the schedule of special inspections on sheet S00.1 will be paid for by the owner.

◆ END OF SECTION ◆

SECTION 01 50 00
TEMPORARY FACILITIES

1. PART 1 - GENERAL

1.1 TEMPORARY LIGHT AND POWER

- A. Temporary lighting should include protected incandescent lights in each area on a separate circuit from the general building lighting and be energized even though all other electrical equipment in the area is turned off.
- B. No temporary wiring, fittings, receptacles, etc. shall be used for permanent wiring and shall be removed as soon as the permanent wiring is installed. All temporary wiring shall be protected against damage, the normal operation of trades, owner's personnel and visitors to the site.
- C. All temporary power installations shall be in accordance with all applicable provisions of Federal, State and Local safety laws, building codes and standards.
- D. The electrical contractor shall not be responsible for any special electrical service requirements on any contractors relating to temporary hoists, cranes or welding equipment.
- E. Payment for Electrical Power Use
 - 1) The Owner will pay for electric energy consumed from the existing building electrical service.

1.2 TEMPORARY PHONES

- A. Provide cell phone numbers of all of the supervisors working on this project to all Owner and Associate's personnel working on this project. Each Contractor will be required to provide Emergency 24 hr contacts for the Owner and Associate Engineer.

1.3 TEMPORARY OFFICE

- A. Each Contractor: Maintain a temporary office for the use of the contractor, his subcontractors, agents, and the Architect. Maintain a complete set of drawings and specifications marked up-to-date with revisions at this office at all times.

1.4 TEMPORARY WATER

- A. The Owner will provide water at no cost to the contractors. The General Contractor shall provide a means of conveying water to meet the needs of the contractors.

1.5 TEMPORARY TOILET FACILITIES

- A. At or before start of work, the Contractor shall provide temporary sanitary convenience for workmen, and shall maintain same antiseptic until the completion of his contract. This installation shall be provided in a manner acceptable to the

Engineer and the Owner. At completion of the work, the Contractor shall remove this facility to the satisfaction of the Engineer.

1.6 PARKING

- A. Contractor parking arrangements will be determined at the Pre-construction meeting. All contractor employees' personal vehicles must be parked in these approved parking areas or may be subject to towing at contractor's expense.

1.7 MATERIAL STORAGE

- A. Material storage arrangements will be determined at the Pre-construction meeting. It will be the contractor's responsibility to secure their stored materials. The Owner will not be responsible for any materials that may become missing or stolen.

1.8 CLEANING UP

- A. The Contractor shall frequently clean up and dispose of all refuse, rubbish, scrap materials and debris caused by his operations to the end that at all times the site shall present a neat, orderly and workmanlike appearance. Crates and cartons in which materials, equipment, or fixtures are received shall be removed daily.
- B. The site shall be kept free of debris and swept weekly or as may be necessary.
- C. The Contractor shall provide a dumpster for disposal of all demolition and waste material. The Owner shall have first rights to any demolition items. The dumpster shall include all temporary provisions required for protecting the existing parking lot that is to remain with no new work.
- D. All contractors, at the completion of their branch of work, shall remove all surplus material, false work, and debris of every nature resulting from their operations and put the site in a neat and orderly condition.

1.9 TEMPORARY SIGNS

- A. Signs or advertisements are not permitted to be displayed without Owner's approval.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. The Contractor's attention is specifically directed, but not limited, to the following documents for additional requirements:
 - 1) The Supplemental General Conditions and Special Conditions for Construction.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1) Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2) New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3) Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for

purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles. Note that no substitutions for convenience are allowed per Section 00 72 13 General Conditions.
 - 1) Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2) Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within one week of receipt of a comparable product request. Architect will notify Contractor of approval or rejection of proposed comparable product request within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
 - a) Form of Approval: As specified in Section 01 33 00 "Submittal Procedures."
 - b) Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- B. Basis-of-Design Product Specification Submittal: Comply with requirements in Section 01 33 00 "Submittal Procedures." Show compliance with requirements.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 - 1) Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 - 2) Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.

- 3) Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
- 4) Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

- 1) Store products to allow for inspection and measurement of quantity or counting of units.
- 2) Store materials in a manner that will not endanger Project structure.
- 3) Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
- 4) Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
- 5) Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
- 6) Protect stored products from damage and liquids from freezing.
- 7) Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.
- 1) Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
 - 2) Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

- 1) Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 - 2) Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
 - 3) See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Section 01 78 00 "Project Closeout and Warranties."

2. PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
- 1) Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2) Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3) Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4) Where products are accompanied by the term "as selected," Architect will make selection.
 - 5) Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
- B. Product Selection Procedures:
- 1) Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - 2) Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- 3) Products:
 - a) Restricted List: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
- 4) Manufacturers:
 - a) Restricted List: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered unless otherwise indicated.
- 5) Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers and/or products, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.
- C. Visual Matching Specification: Where Specifications require "match Architect's sample", provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 - 1) If no product available within specified category matches and complies with other specified requirements, comply with requirements in Section 00 72 13 General Conditions for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Architect will consider Contractor's request for comparable products when the following conditions are satisfied. Note that substitutions for convenience are not allowed per Section 00 72 13 General Conditions. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with these requirements:

- 1) Evidence that the proposed product does not require revisions to the Contract Documents; that it is consistent with the Contract Documents and will produce the indicated results; and that it is compatible with other portions of the Work.
- 2) Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
- 3) Evidence that proposed product provides specified warranty.
- 4) List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
- 5) Samples, if requested.

3. PART 3 - EXECUTION (Not Used)

◆ END OF SECTION ◆

SECTION 01 73 00
EXECUTION REQUIREMENTS

1. PART 1 - GENERAL

1.1 Related Documents

- A. Construction Documents and general provisions of the Agreement Between Owner and Contractor, including Division 00 General Conditions of the Contract for Construction and Supplementary Conditions and other Division 01 Specification Sections, applicable to this Section. All methods herein are to follow all applicable state and local code as well as installation standards.

1.2 Summary

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1) Construction layout.
 - 2) Installation of the Work.
 - 3) Cutting and patching.
 - 4) Coordination of Owner-installed products.
 - 5) Progress cleaning.
 - 6) Starting and adjusting.
 - 7) Protection of installed construction.
 - 8) Correction of the Work.
- B. Related Sections
 - 1) 01 78 00 Project Closeout and Warranties
 - 2) 01 78 05 Operating and Maintenance Data

1.3 Definitions

- A. Cutting: Removal of in-place construction necessary to permit installation or performance or other work
- B. Patching: Fitting and repair work required to restore construction to original/desired conditions after installation of other work.

1.4 Warranty

- A. Existing Warranties: Remove, replace, patch and repair materials and surfaces which were cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

2. **PART 2 - PRODUCTS (NOT USED)**

3. **PART 3 - EXECUTION**

3.1 Safety

- A. Safety and supervision of construction procedures are Contractor's responsibility as stated in the General Conditions. The Consultant does not claim expertise in, and take no responsibility for, construction means and methods or job site safety during construction. Processing and approving submittals made by Contractor which may contain information related to construction methods or safety issues, or participation in meetings where such issues might be discussed must not be construed as voluntary assumption by the design professional of any responsibility for safety procedures.

3.2 Examination

- A. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.
 - 1) Before construction, verify the location and points of connection of utility services.
- B. Existing substrates: Examine the substrate or structure to which a product is to be applied or installed. Do not proceed until unsatisfactory conditions have been corrected. Starting the Work indicates acceptance of conditions and the installer assumes full responsibility for results.
 - 1) Check the substrate or structure for proper clearances and tolerances. Tolerances may be listed under individual Sections.
 - 2) Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
 - 3) Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 - 4) Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

- 5) Contractor shall perform surface inspections and correct/ prepare as necessary to create suitable substrates for application, installation and placement of all products.

3.3 Preparation

- A. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of the Contractor, submit a request for information to Architect/Engineer according to requirements in Division 01 Section "Project Management and Coordination."
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Substrates: Where products are applied to an existing or new substrate, prepare the substrate as recommended by the product Manufacturer, generally as follows:
 - 1) Bring substrate to a uniform surface by smoothing uneven surfaces and filling holes, cracks and low places with recommended filler or parent material.
 - 2) Depressed Slabs: Bring substrate to required elevation to receive finish materials where finish materials cannot completely fill depression. Use approved cementitious filler or parent material. Coordinate depressed slab locations with finish material locations.
 - 3) Remove substances, such as dust, oils and other foreign matter, not compatible with the product.
 - 4) Surfaces shall be dry, unless a moisture content or wetting is specified.
- E. Floor preparation for installation of finish flooring materials: The General Trades Contractor shall provide all major floor preparation for floor finishes, including preparation for resilient flooring and carpet floor finishes furnished and installed by the Owner. Floor preparation shall include the following:
 - 1) Following removal of the existing flooring materials and adhesives, clean, repair and prepare subfloor surfaces to receive new floor finishes. Remove surface irregularities that would telegraph to the finish floor surface. Grind ridges and raised areas. Fill holes and depressions and repair cracks. Subfloor surfaces shall be clean, smooth, level with not

more than 1/8" in 10'-0" variation, free of holes, depressions and cracks and suitable to receive resilient and carpeting finish flooring materials.

- 2) Filling all holes in existing and new concrete floor slabs.
- 3) Filling and patching trenches in existing and new concrete floor slabs after the trenches are cut and filled.
- 4) Cleaned and repaired subfloor surfaces will be inspected and shall be acceptable to the Owner before installation of finish flooring materials.

F. Inserts and Anchorages:

- 1) Anchorages where not detailed are the responsibility of the installer to design a suitable connection, structurally sound, and aesthetically acceptable to the Architect. Furnish calculations, drawings, product data when requested by the Architect.
- 2) It is the responsibility of the installer to furnish built in fastening devices for their product to the proper trade for installation as the Work proceeds.
- 3) In the event such devices are not furnished in time to be built in, it is the installer's responsibility to provide other methods for attaching their product. Submit Drawings and other required data to the Architect.

G. Templates: Provide templates, diagrams and other coordinating documents to the proper Contractor, Manufacturer, or supplier of related items affecting the Work.

H. Dimensions:

- 1) If the exact location of an item is not indicated by dimension on the Drawings or noted in the Specifications, the Architect reserves the right to determine such location in the field prior to roughing in.
- 2) If the exact dimensions of a product are not indicated or shown, the Architect reserves the right to determine dimensions prior to ordering or fabricating the product.
- 3) Such dimensional changes shall not be a basis for changes in the Contract Amount.
- 4) Where miscellaneous devices, such as thermostats, switches, controls, grilles, pipes, or outlets of any nature are not exactly located by the Contract Documents, request such location or obtain approval of the location prior to installation. If approval has not been obtained, the Architect may direct the relocation of such devices at the expense of the installer.

3.4 Construction Layout

- A. Verification: Before proceeding to lay out the Work, verify layout and work point information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify the Architect promptly
- B. Building Lines and Levels: Locate and lay out control lines and levels for structures, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels.

3.5 Installation

- A. Install products in accordance with the Manufacturer's recommendations or the requirements of trade associations, listed standards, approved Shop Drawings, and Contract Documents.
 - 1) Where a conflict exists between these references, the most stringent requirements govern. If printed instructions are not available, consult with the Manufacturer's field representative.
- B. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Contract Completion.
- C. Install Work in a manner that will not interfere with the proper installation of the Work of other trades.
- D. Install Work in a manner to facilitate operating, servicing, and repairing.
- E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Anchors and Fasteners: Provide anchors and fasteners approved by the manufacturer and as required to anchor each component securely in place, accurately located and aligned with other portions of the Work.
 - 1) Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by the Architect.
 - 2) Allow for building movement, including thermal expansion and contraction.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

- I. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 Workmanship

- A. Install products straight, plumb, level, and in line. Securely attach items to the substrate, using recommended adhesives, mechanical fasteners or other devices.
 - 1) Exercise safe installation practices and follow all local, federal codes as well as industry standards for all types of installations. Where holes are provided for attachment, do not field drill or cut new holes without the approval of the Associate Architect.
- B. Match all finished Work to the approved submitted Samples or approved Sample panels.
- C. Conceal fasteners wherever possible, unless exposed fasteners are permitted or specified.

3.7 Correction of Work

- A. Contractor shall repair or remove and replace any defective construction or damaged products due to installer error and/or construction damage. The restored damage shall then be restored to match original and/or new surrounding construction.
 - 1) Repairing shall include replacing defective parts, refinishing damaged surfaces, touching up with matching materials and properly adjusting operating equipment
 - 2) Contractor shall remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
 - 3) Contractor shall repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
 - 4) Contractor shall remove and replace chipped, scratched and broken glass.

◆ END OF SECTION ◆

1. PART 1 – GENERAL

1.1 COMPLETION

A. Project Close Out

- 1) Throughout the progress of the Work, the Contractor shall keep a current, detailed record of changes in the installation of his own work from the conditions, locations, and layout shown on the accompanying drawings or manufacturer details. This information shall be submitted to the Consultant. This requirement does not authorize any deviations without the approval of the Owner or Owner's Representative.
- 2) When all revisions showing Work as finally installed are made, the field record drawings (as-builts) shall be delivered to the Owner before final payment is made.
- 3) Submit the following before final payment is made:
 - a) Project record documents
 - b) Guarantees and warranties
 - c) Applicable waivers of lien
 - d) Invoice(s) reflecting adjustments and previous progress payments
 - e) Consent of Surety to Final Payment
 - f) Signed punch list

1.2 CLEANING AND CLOSEOUT

- A. Each contractor or subcontractor, in addition to the responsibilities set forth in the General Conditions, shall keep the premises free from accumulation of waste materials or rubbish caused by their employees or Work.
- B. At the completion of the Project, the Contractor shall restore or replace all property damaged by their Work and remove spots, paint, soil, concrete, writing, droppings, or other foreign material from Work. Remove temporary protection from the Work.
- C. Consultant will issue a punch list, along with a drawing, showing locations of the unacceptable Work items to the Contractor after Substantial Completion of the Project.
- D. Contractor shall be responsible for maintaining work areas in a neat and orderly manner. Upon completion, cleanup shall be performed to the satisfaction of the

Owner or Owner's Representative. Contractor shall be responsible for the return of site-exposed surfaces to their original condition prior to the start of the Work.

- E. Contractor shall complete all necessary cleanup within 10 working days after receiving notification of cleanup requirements as outlined in the punch list.

1.3 WARRANTIES

- A. Contractor: Provide a written one (1) year warranty against defective materials, defective workmanship, and water leakage. Warranty shall cover 100% replacement of the completed work as required during the warranty period.
- B. Manufacturers:
 - 1) Provide a written minimum twenty (20) year warranty against defective materials from the primary manufacturer furnishing products for silicone elastomeric sealants.
 - 2) Provide a written minimum ten (10) year warranty against defective materials from the primary manufacturer furnishing products for polyurethane elastomeric sealants.
 - 3) Provide a written minimum twenty (20) year warranty against finish fade, chalk and peel from the primary manufacturer furnishing products for sheet metal copings and flashings.
 - 4) Provide a written minimum ten (10) year warranty against defective materials from the primary manufacturer furnishing products for elastomeric coatings.
- C. Before final payment is made, submit a written warranty to Owner agreeing to repair or replace defective materials and workmanship during the warranty period. Include all manufacturer material warranties for the maximum term available for the specified Work.
- D. Defective materials and workmanship include abnormal deterioration, aging, or weathering.
- E. The Contractor is to certify in writing that all work is in accordance with the Contract Documents, including authorized alterations or additions thereto, and that should any defect developed during the warranty period due to improper workmanship or materials under this jurisdiction, such defects are to be repaired or replaced at no expense to the Owner.
- F. The warranty does not include damages caused by vandalism, or natural conditions, exceeding the performance requirements.
- G. The warranty shall be transferable upon exchange of building ownership.

- H. The warranty issued must facilitate visual reviews by the Consultant at approximately the 12 month anniversary of project completion.

2. PART 2 – PRODUCTS

2.1 NOT USED

3. PART 3 – EXECUTION

3.1 NOT USED

◆ END OF SECTION ◆

1. PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

- A. Compile product data and related information appropriate for the Owner's maintenance and operation of products furnished under the Contract. Prepare maintenance data as specified in this Section and as referenced in other pertinent Sections of the Specifications.
- B. Prepare data in the form of a manual for use by the Owner's personnel.

1.2 CONTENT OF THE MANUAL

- A. Contractor, name or responsible principal, address and telephone number.
- B. A list of each product required to be included, indexed to the content of the volume.
 - 1) List with each product the name, address, and telephone number of:
 - a) Subcontractor or installer
 - b) Maintenance contractor, as appropriate
 - c) Identify the area of responsibility of each
 - d) Local source of supply for products, materials, and replacement
 - 2) Identify each product by product name and other identifying symbols as set forth in Contract Documents.
- C. Product Data
 - 1) Include only those sheets which are pertinent to the specific product.
- D. Drawings
 - 1) Shop drawings
 - 2) As-built drawings, for any details differing than those included in the Contract Documents.
- E. Copy of each warranty, guarantee, bond and service contract issued.
 - 1) Provide information sheet for the Owner's personnel and give:
 - a) Proper procedures in the event of failure.

- b) Instances which might affect the validity of warranties/guarantees or bonds.

1.3 MANUAL FOR MATERIALS AND FINISHES

- A. Content for architectural products, applied materials and finishes.
 - 1) Manufacturer's data, giving full information on products.
 - 2) Instructions for care and maintenance.
- B. Provide complete information for products as specified in each respective Section.

1.4 INSTRUCTIONS TO THE OWNER'S PERSONNEL

- A. Prior to final inspection or acceptance, fully instruct the Owner's designated maintenance personnel in the maintenance of each product and system.

2. PART 2 – PRODUCTS (NOT USED)

3. PART 3 – EXECUTION (NOT USED)

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1) Record Drawings.
 - 2) Record Specifications.
 - 3) Record Product Data.
 - 4) Miscellaneous record submittals.
- B. Related Requirements:
 - 1) 01 78 00 project Closeout and Warranties
 - 2) 01 78 05 Operating and Maintenance Data

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1) Number of Copies: Submit one set of marked-up record prints.
 - 2) Number of Copies: Submit copies of record Drawings as follows:
 - a) Initial Submittal:
 - [1] Submit PDF electronic files of scanned record prints and
 - [2] Submit record digital data files.
 - [3] Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b) Final Submittal:
 - [1] Submit PDF electronic files of scanned record prints.

- [2] Print each drawing, whether or not changes and additional information were recorded.
 - c) Final Submittal:
 - [1] Submit one paper-copy of marked-up record prints.
 - [2] Submit record digital data files and three set(s) of record digital data file plots.
 - [3] Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit annotated PDF electronic files and directories of each submittal.
 - 1) Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

2. PART 2 - PRODUCTS

2.1 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.
 - 1) Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a) Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.

- b) Accurately record information in an acceptable drawing technique.
 - c) Record data as soon as possible after obtaining it.
 - d) Record and check the markup before enclosing concealed installations.
 - e) Cross-reference record prints to corresponding archive photographic documentation.
- 2) Content: Types of items requiring marking include, but are not limited to, the following:
- a) Dimensional changes to Drawings.
 - b) Revisions to details shown on Drawings.
 - c) Depths of foundations below first floor.
 - d) Locations and depths of underground utilities.
 - e) Revisions to routing of piping and conduits.
 - f) Revisions to electrical circuitry.
 - g) Actual equipment locations.
 - h) Duct size and routing.
 - i) Locations of concealed internal utilities.
 - j) Changes made by Change Order or Change Directive.
 - k) Changes made following Architect's written orders.
 - l) Details not on the original Contract Drawings.
 - m) Field records for variable and concealed conditions.
 - n) Record information on the Work that is shown only schematically.
- 3) Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
- 4) Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
- 5) Mark important additional information that was either shown

schematically or omitted from original Drawings.

- 6) Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
- 1) Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 - 2) Format: DWG, DXF, Version 2010, Microsoft Windows operating system.
 - 3) Format: Annotated PDF electronic file.
 - 4) Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 - 5) Refer instances of uncertainty to Architect for resolution.
 - 6) Architect will furnish Contractor one set of digital data files of the Contract Drawings for use in recording information.
 - a) See Section 01 33 00 "Submittal Procedures" for requirements related to use of Architect's digital data files.
 - b) Architect will provide data file layer information. Record markups in separate layers.
- C. Newly Prepared Record Drawings: Prepare new Drawings instead of preparing record Drawings where Architect determines that neither the original Contract Drawings nor Shop Drawings are suitable to show actual installation.
- 1) New Drawings may be required when a Change Order is issued as a result of accepting an alternate, substitution, or other modification.
 - 2) Consult Architect for proper scale and scope of detailing and notations required to record the actual physical installation and its relation to other construction. Integrate newly prepared record Drawings into record Drawing sets; comply with procedures for formatting, organizing, copying, binding, and submitting.
- D. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
- 1) Record Prints: Organize record prints and newly prepared record Drawings into manageable sets. Bind each set with durable paper cover

sheets. Include identification on cover sheets.

- 2) Format: Annotated PDF electronic file.
- 3) Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
- 4) Identification: As follows:
 - a) Project name.
 - b) Date.
 - c) Designation "PROJECT RECORD DRAWINGS."
 - d) Name of Architect.
 - e) Name of Contractor.

2.2 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 - 1) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 - 2) Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 - 3) Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 - 4) For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 - 5) Note related Change Orders and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

2.3 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data

submittal.

- 1) Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
- 2) Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
- 3) Note related Change Orders, record Specifications, and record Drawings where applicable.

B. Format: Submit record Product Data as annotated PDF electronic file.

- 1) Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

2.4 MISCELLANEOUS RECORD SUBMITTALS

A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

B. Format: Submit miscellaneous record submittals as PDF electronic file.

- 1) Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

3. PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.

B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

◆ END OF SECTION ◆



Project Manual for the Construction of:

FACILITY NAME
PROJECT TITLE

WHAT County, Ohio

DNR-xxxxxxx

Date



SECTION 01 10 00
SUMMARY OF WORK

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to the Section.

1.2 PROJECT IDENTIFICATION

- A. Name and Location of Project
- B. Consultants

1.3 PROJECT SUMMARY

- A. Short Scope and Project Description

1.4 SCOPE OF WORK

- A. If desired or required include detailed scope of work.

1.5 ACCESS TO SITE

1.6 COORDINATION WITH OCCUPANTS

1.7 WORK RESTRICTIONS

1.8 SPECIFICATION & DRAWING CONVENTIONS

1.9 ALLOWANCES

1.10 UNIT PRICES

1.11 ALTERNATES

1.12 CONTRACT MODIFICATION PROCEDURES

1.13 PAYMENT PROCEDURES

- A. Date Due
- B. Form
- C. SOV Requirements
- D. Required Documentation

1.14 PROJECT MANAGEMENT AND COORDINATION

- A. Coordination Drawings
- B. Key Personnel

C. RFI's

D. Project Meetings

1.15 CONSTRUCTION PROGRESS SCHEDULE

A. Include any milestones and substantial completion information. Sequencing and coordination information can be included here.

B. Schedule Software

C. Contract Schedule Sample Table

Schedule Milestones	Contract Time	Project Date
Bids Received		
Controlling Board		
Notice to Proceed		
Mobilization		
Milestone 1		
Milestone 2		
Substantial Completion		
Occupancy		

1.16 SUBMITTAL PROCEDURES

A. Paper or Electronic

B. Time Frame

C. Submittal Schedule

1.17 QUALITY REQUIREMENTS

A. Tests and Inspections

1. If part of the contractor's scope of work and not specified elsewhere include testing requirements. Insure the testing is not included in AE Scope of Work.

B. Mock-ups

C. Shop Drawings

D. Contractor Quality Control Plan

1.18 REFERENCES

1.19 TEMPORARY FACILITIES & CONTROLS

A. Site plan showing temporary facilities

B. Surveying & Field Dimensions

- C. Erosion & Sediment Control
- D. Moisture Protection Plan
- E. Duct Control and HVAC Control Plan
- F. Field Offices
- G. Fencing
- H. Fire Extinguishers
- I. Temporary Utilities – Coordinate with GC's
- J. Temporary usage
 - 1. Temporary Roadways
 - 2. Non-Smoking
 - 3. Hours
- K. Parking
- L. Traffic Controls
- M. Dewatering
- N. Existing Condition Video

1.20 TEMPORARY TREE AND PLANT PROTECTION

1.21 PROJECT CONSTRUCTION SIGN

1.22 PRODUCT REQUIREMENTS

1.23 EXECUTION

- A. Cutting and Patching
- B. Correction of the Work
- C. Cleaning

1.24 CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

- A. Waste Management Plan

1.25 CLOSEOUT PROCEDURES

- A. O&M Manuals
- B. As-Builts
- C. Start-ups
- D. Documentation

1.26 OPERATION AND MAINTENANCE DATA

1.27 PROJECT RECORD DOCUMENTS

1.28 DEMONSTRATION AND TESTING

1.29 MISCELLANEOUS

- A. PERMITS – if required – as a reminder the standard AE Agreement includes permits within the AE Scope of Work
 - 1. National Pollutant Discharge Elimination System (“NPDES”) Storm Water General Permit.
 - a. The Contractor shall comply with all requirements and conditions of the NPDES general permit, including, but limited to, implementing and maintaining the sedimentation and erosion control measures specified in the storm water pollution prevention plan prepared by the Contractor pursuant to Section 5.2.4 (and as changed within the Supplementary Conditions), which are related to the Work, maintaining records of the its construction activities, removing material no longer required, and taking proper action if there is a reportable quantity spill.
 - b. Unless otherwise stated in the Bid Documents, the Contractor shall secure the NPDES general permit by submitting a Notice of Intent (“NOI”) application form to the Ohio Environmental Protection Agency at least 45 days prior to the start of construction.
 - c. Unless otherwise provided in the Bid Documents, the Contractor shall prepare and certify a storm water pollution prevent plan to provide sedimentation and erosion controls to the project.
 - d. The Contractor shall prepare and process the required Notice of Termination (“NOT”) prior to Contract Completion.
 - 2. Any permits directly relating to Contractor’s Scope of Work.
- B. INTERRUPTIONS
 - 1. Whenever it becomes necessary to interrupt existing services in use by the Owner or its tenants, including but not limited to sewer, water, gas, and steam lines, electric, telephone, and cable service, the Contractor shall continue the associated Work on a non-stop basis until that Work is completed and the service restored. If directed, the Contractor shall work on a 24-hour per day basis to restore service in exception to Section 6.2.13 (as amended in the Supplementary Conditions).
- C. Explosives
 - 1. Use of explosives and blasting will not be permitted.
- D. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.
- E. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
- F. Existing Conditions: Notify Architect of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.
- G. Allowances
- H. Construction Documentation / Reports from Contractor
- I. Special Warranties
- J. Owner Furnished items to be incorporated into the Work
- K. Field Dimensions and Elevations

L. Utility Location

END OF SECTION

1. PART 1 - GENERAL

1.1 SCOPE

- A. The Contractor shall fully acquaint himself with all existing conditions that will affect the demolition of portions of the existing park office and park store both inside the structures and all site related items.
- B. Although every attempt has been made to indicate all work required to be removed, each Contractor shall visit and examine the sites to determine the precise extent of work involved.
- C. The work shall consist of the removal and the satisfactory disposal of the existing building materials in their entirety including but not limited, doors, door frames, suspended ceiling grid and tiles, floor tiles, carpet, concrete, masonry and such other items which may exist in the area of construction.
 - 1) The Contractor shall remove from the site and dispose of all demolition material. No burning of materials on site shall be permitted.
 - 2) The remaining salvageable items shall be the property of the Contractor.
 - 3) Some items are to be removed by others as indicated.
 - 4) Contractor to be aware of the items within project that are to be salvaged either back to the owner or into new location within project.
- D. This Contractor shall protect the demolition area to prevent injury to people passing by.
- E. Contractor shall coordinate demolition with the Owner and Architect.
- F. This contractor shall be responsible for the shoring of all walls, ceilings and floors adjacent to areas where demolition is schedule to take place.
- G. Regarding any demolition to exterior site items, this contractor shall protect existing trees, shrubs, groundcovers and grass to remain and shall also protect any sidewalks and paved surfaces.
 - 1) Tree Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and defined by the drip line of individual trees or the perimeter drip line of groups of trees, unless otherwise indicated.
- H. Remove trees, shrubs, groundcover and other vegetation as indicated on drawings.

1.2 DISPOSAL OF DEMOLISHED MATERIAL

- A. Remove demolished material from site that cannot be salvaged or recycled and dispose of in an EPA-approved landfill.

2. PART 2 – MATERIAL

- 2.1 Provide any and all material and machinery required for safe and efficient removal of items noted on the drawings and any other items as may be required to be removed to complete the work specified.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. See drawings for any demolition work.
- B. Remove all exterior masonry walls, exterior canopies, flooring, doors and hardware and other items as may be required to complete the work. Coordinate the demolition of mechanical systems, louvers and diffusers, along with the demolition of electrical lights, outlets, and data ports with each of the respective sub-contractors prior to beginning of work. Terminate all live circuits.
- C. Remove all electrical devices, plumbing fixtures and service piping to same and all heating equipment and piping to same.
- D. Remove all asphalt paving and base, paving blocks, curbs, catch basins, walks, trees, shrubs, and such other items as may be required to complete the work.

3.2 DEMOLITION WORK

- A. This Contractor shall demolish and remove all of the following as specified and indicated on the drawings:
 - 1) One story camp store and check in office, in its entirety including but not limited to the foundation, walls, roofing, windows, doors, siding, all utilities, etc.
 - 2) One story camp office, in its entirety including but not limited to the foundation, walls, roofing, windows, doors, siding, all utilities, etc.
 - 3) Pavement.
 - 4) Curbs and walk ways.
 - 5) Hydrants
 - 6) Post and bollards
 - 7) Site utilities
 - 8) Concrete slabs on grade.

- 9) Foundation walls.
- 10) Foundation below finish grade.
- 11) Hot and cold water lines.
- 12) Sanitary waste lines.
- 13) Equipment which may be connected to plumbing systems.
- 14) Water pumps, condensate and vacuum pumps.
- 15) Steam supply and condensate return lines.
- 16) Hot water supply and returns.
- 17) Terminal heating units and miscellaneous accessories.
- 18) Lighting fixtures, switches, receptacles, etc.
- 19) Electrical conduit and wire.
- 20) Electrical panels, transformers, and miscellaneous items.
- 21) Such other materials as may exist.
- 22) Trees, stumps, brush, etc.

3.3 RECYCLING

- A. The contractor shall see to it that all demolished materials are recycled to the extent that it is practical.

3.4 DISPOSAL

- A. All wood, structural, metal, plaster and roofing materials, masonry, concrete and asphalt paving shall be removed from the site. No burning materials on site shall be permitted.

3.5 TREE PROTECTION

- A. Tree Protection Zone applies to all areas outside construction fencing and erosion control silt fence. Erect and maintain additional temporary fencing around tree protection zones before starting site demolition. Remove fence when construction is complete.

- 1) Do not store construction materials, debris, or excavated material within tree protection zone.

- 2) Do not permit vehicles or equipment within tree protection zone without prior approval of the Owner.
- B. Do not excavate within tree protection zones, unless otherwise indicated.
 - a) Most roots of trees and shrubs occur in top 18 inches (450 mm) of soil.
- C. Where excavation for new construction is required within tree protection zones, hand clear and excavate to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.
 - 1) Cover exposed roots with burlap and water regularly.
 - 2) Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
 - 3) Coat cut faces of roots more than 1-1/2 inches in diameter with emulsified asphalt or other approved coating formulated for use on damaged plant tissues.
 - 4) Backfill with soil as soon as possible.
- D. Repair or replace trees and vegetation indicated to remain that are damaged by construction operations, in a manner approved by Owner.
 - 1) Replace trees that cannot be repaired and restored to full-growth status, as determined by Owner.

3.6 SELECTIVE TREE, SHRUB AND VEGETATION REMOVAL

- A. Remove trees, shrubs, grass, and other vegetation to permit installation of new construction.
 - 1) Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated. Coordinate selective tree, shrub and vegetation removals with requirements of "Site Clearing" Section.
 - 2) Cut minor roots and branches of trees indicated to remain in a clean and careful manner where such roots and branches obstruct installation of new construction.
 - 3) Grind stumps and remove roots, obstructions, and debris extending to a depth of 18 inches below exposed subgrade.
 - 4) Use only hand methods for grubbing within tree protection zone.
 - 5) Chip removed tree branches and dispose of off-site.

- 6) Coordinate with Site and Landscape Drawings.
- B. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.
 - 1) Place fill material in horizontal layers not exceeding a loose depth of 8 inches, and compact each layer to a density equal to adjacent original ground.

3.7 PROTECTION AND CLEAN-UP

- A. Clean and keep in an orderly manner. Protect portion of existing structure where no work is scheduled to take place and adjoining property when demolition occurs on site.

◆ END OF SECTION ◆

CONCRETE FORMS AND ACCESSORIES

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary metal pan forms, slip forms, and corrugated paper forms for placing concrete.

1.2 QUALITY ASSURANCE

- A. Codes and Standards: Unless otherwise specified, design, construct, erect, maintain, and remove forms and related structures for cast-in-place concrete work in compliance with the American Concrete Institute Standard ACI 347-94, "Recommended Practice for Concrete Formwork."

2. PART 2 - PRODUCTS

2.1 FORM MATERIALS

A. Forms:

- 1) Use plywood, metal, or metal framed material to provide a continuous straight smooth surface, with bracing as necessary to eliminate bowing and deflection.

B. Form Coatings

- 1) Form-coating compounds shall not bond with, stain, nor adversely affect concrete surfaces and will not impair subsequent treatment of concrete surfaces requiring bond or adhesion, nor impede the wetting of surfaces to be cured with water or curing compounds.

3. PART 3 - EXECUTION

3.1 CONSTRUCTION

A. Generals:

- 1) Construct forms complying with ACI 347 to the exact sizes, shapes, lines, and dimensions as required to obtain accurate alignment, location, grades, level, and plumb work in finish structures. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages, and inserts, and other features required.
- 2) Removal of forms shall not occur until concrete has hardened sufficiently to carry its own weight. Contractor responsible for timing and safety of form removal.

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3) Patching and Grouting:

- a) After forms have been removed, check surface of concrete and correct defects. Fill pin holes and honey combs with neat cement, group and trowel to match surrounding area. Rub entire surface with an abrasive stone until all ribs, ridges, etc. are obliterated.

B. Allowable Tolerances

- 1) Construct formwork to provide completed cast-in-place concrete surfaces complying with the tolerances specified in ACI 347.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Basic information about curing, standard finishing, cements, aggregates, plasticizers and other chemical admixtures, additives, and hardeners.
- B. Cast-in-place concrete, and accessory items shown on the drawings or specified herein.
- C. Concrete equipment bases (foundations), grouting of structural parts bearing on masonry or concrete and testing service.
- D. Sleeves, piping, inserts, conduits, hangers, ties, etc. provided by other trades under separate contracts shall be installed by the General Trades Contractor.

1.2 QUALITY ASSURANCE

- A. Float Finish (Flt-Fn) - Not Critical Floor Tolerance:
 - 1) Specified Overall Value: FF 25/FL 20.
 - 2) Minimum Local Value: FF 20/FL 17.
 - 3) Apply float finish to monolithic slab surfaces that are to receive trowel finish and other thick finishes as hereinafter specified, and slab surfaces which are to be covered with waterproofing membrane or sand-bed terrazzo, thickset tile, and other areas which receive a mud/setting bed.
- B. Trowel Finish 1 (Tr-Fn1) - Typical Office, Corridors, and Normal Sized Rooms (Under 1,000 sq.ft.):
 - 1) Specified Overall Value: FF 30/FL 23.
 - 2) Minimum Local Value: FF 25/FL 20.
 - 3) Apply trowel finish to slab surfaces that are to be covered with resilient flooring, paint, or other thin film finish coating system.
- C. Trowel Finish 2 (Tr-Fn2) - Large Rooms and Public Areas (Over 1,000 sq.ft.):
 - 1) Specified Overall Value: FF 36/FL 25.
 - 2) Minimum Local Value: FF 30/FL 22.
 - 3) Apply trowel finish to monolithic slab surfaces that are to receive resilient flooring, carpet, or other thin finish system.

- D. Nonslip Broom Finish (NsBrm-Fn): Apply nonslip broom finish to exterior concrete stoops and mechanical slabs.
 - 1) Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom, perpendicular to main traffic route.
- E. Reference Standards:
 - 1) ACI 315, Manual of Standard Practice for Detailing Reinforced Concrete Structures.
 - 2) ACI 318-89, Building Code Requirements for Reinforced Concrete.
 - 3) ACI 347, Recommended Practice for Concrete Formwork

1.3 SUBMITTALS

- A. Submit a mix design for each class of concrete required.
- B. Submit shop drawings for all reinforcing. Indicate strength, size and details of all bar reinforcing and style.
- C. Submit product literature for admixtures and curing compounds proposed for use. Include chloride content.
- D. Concrete testing shall be done by a testing agency retained by the Contractor. All concrete testing shall be paid for by the Contractor.

1.4 FIELD REFERENCE MANUALS

- A. Provide at least one copy of CRSI's "Placing Reinforcing Bars", in the field office.
- B. Keep one copy of ACI-301 "Specifications for Structural Concrete for Buildings," in the field office.
- C. Keep one copy of ACI-SP-15 "Field Reference Manual" in the field office.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Aggregates
 - 1) ASTM C33, normal weight aggregates.
- C. Water: Potable.
- D. Concrete Admixtures: Containing less than 0.1 percent chloride ions.

- 1) Air-Entraining Admixture: ASTM C 260, for exterior exposed concrete and foundations exposed to freeze-thaw.
- 2) Water-Reducing Admixture: ASTM C 494, Type A, for placement and workability.
- 3) High-Range Water-Reducing Admixture, Super Plasticizer: ASTM C 494, Type F or G for placement and workability.
- 4) Water-Reducing, Accelerating Admixture: ASTM C 494, Type E for placement and workability.
- 5) Water-Reducing, Retarding Admixture: ASTM C 494, Type D for placement and workability.

2.2 RELATED MATERIALS

- A. Vapor Barrier: Premolded membrane, ASTM E96, Method B, 0 vapor transmission rate.
- B. Chemical Bonding Agent: Film-forming, freeze-thaw resistant compound suitable for brush or spray application, complying with ASTM C881.
- C. Concrete Curing Materials
 - 1) Moisture-Retaining Cover: One of the following, complying with ANSI-ASTM C171 for concrete floors, that are to be exposed or to receive floor sealer.
 - a) Waterproof paper
 - b) Polyethylene film
 - c) White burlap-polyethylene sheet
 - 2) Absorptive Cover: Burlap cloth made from jute or kenaf, weighing approximately 9 ounce per sq.yd., AASHTO M182, Class 2.
 - 3) Liquid Membrane-Forming Curing Compound: Liquid type membrane-forming curing compound, complying with ANSI/ASTM C309, Type I, Class B, with 18 to 20 percent minimum solids. Provide for concrete floors that are to receive applied finished floor materials.
- D. Self-Leveling Underlayment
 - 1) Self-leveling cement-based. When mixed with water, it becomes a fluid material, seeking its own level, producing a smooth surface. Compressive strength: 4100 psi minimum at 28 days. Flexural strength: 1300 psi at 28 days. Tensile strength: 750 psi at 28 days. Shrinkage: .025 after 7 days.

- E. Epoxy Adhesive: ASTM C881, two-component material suitable for use on dry or damp surfaces. Provide material type, grade, and class to suit Project requirements.

2.3 CONCRETE ADMIXTURES

- A. Use air-entraining admixture in exterior concrete. Add air-entraining admixture at the manufacturer's prescribed rate to result in concrete at the point of placement, having air content within the following limits:
 - 1) Concrete structures and slabs exposed to freezing and thawing, deicer chemicals or subjected to hydraulic pressure:
 - a) 5 percent to plus/minus 1 percent for 2 inch nominal maximum aggregate size.
 - b) 5-1/2 percent to plus/minus 1 percent for 1-1/2 inch nominal maximum aggregate size.
 - c) 6 percent to plus/minus 1 percent for 3/4 and 1 inch nominal maximum aggregate size.
 - d) 7 percent to plus/minus 1 percent for 1/2 inch nominal maximum aggregate size.
 - e) Exterior Concrete in Moderate Exposure Regions: 4-1/2 percent to plus/minus 1 percent for 1 inch nominal maximum aggregate size.
- B. Calcium chloride is not permitted.

2.4 PROPORTIONING AND DESIGN OF MIXES

- A. Proportion mixes by either laboratory trial batch or field experience methods as specified in ACI 301, using materials to be employed on the project for each class of concrete required.
- B. Minimum Cement Content: Concrete mixes shall be limited to the cement content specified in the Concrete Schedule.

2.5 CONCRETE MIXING

- A. Ready-Mixed Concrete: Comply with the requirements of ASTM C94 and as herein specified.
 - 1) Delete the references for allowing additional water to be added to the batch for material with insufficient slump. Addition of water to the batch will be permitted only to replace water lost due to evaporation and only under the direct control of the concrete testing agency field representative.

- 2) During hot weather or under conditions contributing to rapid setting of concrete, a shorter mixing time than specified in ASTM C94 may be required.

2.6 REINFORCING

- A. Deformed Bars: ASTM A615. Minimum yield strength to be 60 ksi.
- B. Steel Wire: ASTM A82, plain, cold-drawn steel.
- C. Welded Wire Fabric: ASTM A185.
 - 1) Use 6" x 6" - W2.1 x W2.1 for 4" thick exterior concrete slabs and sidewalks and interior slabs unless noted otherwise.
- D. Supports for Reinforcement (including welded wire fabric): Bolsters, chairs, spacers and other devices for spacing, supporting, and fastening reinforcement in place.
 - 1) Use wire bar type supports complying with CRSI recommendations, unless otherwise indicated. Do not use wood, brick and other unacceptable materials.
 - 2) Over waterproof membranes, use precast concrete chairs to prevent penetration of the membrane.
 - 3) For footings, trench footings, slabs on grade, and grade beams use precast concrete bricks ($f_c = 3000$ PSI min. at 28 days). (Concrete masonry bricks not acceptable.)
 - 4) For concrete masonry bond beams use #3 bar laterally, tied to each longitudinal reinforcing bar below to hold bars apart and up from bottom. Space #3 bars at 48 inches o.c.

2.7 GROUTING

- A. Grouting all steel bearing plates, columns and other structural parts set to structural hardened concrete, using Castle Chemical "Aquabar Imperial," Sauereisen "F-100", Master Builders "Master Flow #713", Upco "Upcon", or U.S. Grout Corporation "Five Star Group" adding only water. These are non-metallic, non-shrinking grouts and must be prepared and installed in strict accordance with the manufacturer's written recommendations. Use driest practical mix. Unless noted otherwise, use a minimum of 3/4" thickness of grout under bearing plates.

3. PART 3 - EXECUTION

3.1 CONCRETE PLACEMENT

- A. General: Comply with ACI 304, "Guide for Measuring, Mixing, Transporting, and Placing Concrete."

B. Cold Weather Placing

- 1) Protect concrete work from physical damage or reduced strength which could be caused by frost, freezing actions, or low temperatures, in compliance with ACI 306.

C. Hot Weather Placing

- 1) When hot weather conditions exist that would seriously impair the quality and strength of concrete, place concrete in compliance with ACI 305, and as herein specified.

3.2 INSTALLATION

- A. Verify that excavations are free of water and ice, are of the required dimensions, and are acceptable for receiving the concrete.
- B. Determine field conditions by actual measurements.
- C. Notify Architect not less than 24 hours in advance of placing concrete.
- D. Footings may be cast against earth cuts when soil conditions permit with written approval of the Architect.
- E. Bond all curbs and equipment pads to base slabs with bonding agent in accordance with Manufacturer's directions.
- F. Surfaces scheduled to receive membrane waterproofing shall have all form tie holes and bug holes (in excess of 1/2" long and 1/4" deep) filled with concrete. Fins and irregular construction joints shall be ground smooth or filled.

3.3 CONTROL JOINTS

A. Interior Slabs-On-Grade:

- 1) Provide (1/2" thick) isolation joints at columns and at walls. Where isolation joint will be exposed or view, set top of joint filler below top of slab at a distance equal to the filler thickness, to receive sealant. Where not exposed to view, set top of filler flush with top of slab.
- 2) Location of control joints shall be as detailed on the plans or spaced a maximum distance of 20 feet apart each way when not shown on plans.
- 3) Use metal screed key joint.
- 4) Sawed control joints shall be sawed 1/8" wide and depth equal to 1/4 of slab thickness unless otherwise approved. Terminate reinforcing at all control joints. A keyed construction joint may be located where a sawed joint is shown. Sawed control joints shall be used ONLY when indicated

on the drawings or when authorized by the Architect. Sawed joint shall be cut within 8 hours of concrete setting up.

B. Exterior Slabs-On-Grade

- 1) Location of controls joints in exterior slabs shall be located as shown on plans or as follows, if not noted.
- 2) Sidewalks shall have control joints 7/8" deep and spaced 4'-0" to 6'-0" center to center (depending upon the width of the walk). Tool all joint edges. Expansion joints in walks and concrete curbing required at maximum of thirty (30) feet.

3.4 FINISHES

A. All floor surfaces shall be within + or - 3/4" of finished floor elevations designated on plans and specified in part 1.3. If variations greater than this exist, the Architect may direct the Contractor to grind the surfaces to bring them within the requirements. Patching of low spots shall not be permitted. Grinding shall be done as soon as possible, preferably within 3 days, but not until the concrete is sufficiently strong to prevent dislodging coarse aggregate particles .

- 1) All floors shall be measured in accordance with ASTM E1155, "Standard Test Method for Determining Floor Flatness and Levelness Using The 'F Number' System."

B. Where floor drains occur, pitch slabs uniformly toward drains.

3.5 CURING, SEALING AND PROTECTION

A. Temperature: When air temperature during placement is less than 40° F, or will be within 24 hours, temperature of concrete as placed is to be between 50° F. and 90°F (55° F and 90° F for section less than 12" thick). Maintain concrete temperature within these limits for the full curing period of seven days.

B. Curing:

- 1) The concrete floor/slab curing compound shall be a transparent liquid formulated from chlorinated rubber, plasticized and stabilized, and capable of forming a continuous film. It shall contain not less than 18% solids and shall meet the following specifications. Apply at the rate of 300 to 350 square feet per gallon:
 - a) Interior: ASTM C-309-73 Type 1-D, Class "B", clear or translucent with fugitive dye.
 - b) Exterior: ASTM C-309-73 Type 2, Class "A".
- 2) Maintain through measurement of the material applied and the number of square feet covered.

- 3) Apply curing compound by Low Pressure Spray Method, after final finishing operation, and as soon as the water sheen has disappeared. Overnight delays will not be allowed.
- 4) ALL containers of curing compound shall bear the manufacturer's labels indicating the manufacturer and the solids content. Material must be approved by the Architect.
- 5) Before using on concrete which receives additional finishes, obtain approval of the Subcontractor applying such finishes. DO NOT apply curing compounds to areas scheduled to receive Thinset ceramic tile of Thinset terrazzo or urethane floor paint. These areas must be water cured.
- 6) Whichever curing method is used, it is to commence immediately after disappearance of water sheen, and continue for at least seven days. Do not allow curing to be delayed overnight.
- 7) Prevent excessive moisture loss from formed surfaces. If forms are removed before seven days have elapsed, cure the formed surfaces by moist-curing or application of curing compound for the remainder of the curing period.

C. Sealing:

- 1) Exterior: Seal all exterior concrete slabs, stairs, ramps, walks, etc. with a concrete penetrating sealer, gloss rating 0 by W.R. Meadows, PENTREAT 244-100, equals by SAKRETE, Quickrete or approved equal.
- 2) Interior: See section 09 91 00 Paints and Stains

3.6 FIELD QUALITY CONTROL

- A. Contractor shall maintain records of all tests indicating exact location of the structure represented by each test.
- 1) Obtain concrete for required tests at point of placement.
 - 2) For each concrete class, perform one strength test for each 50 yards or fraction thereof placed in any one day.
 - 3) Determine slump for each strength test.
 - 4) Determine air content for each strength test of concrete.
 - 5) Determine concrete temperature for each strength test when air temperature is less than 40 degrees, or will be within 24 hours.
- B. Do not place concrete when slump, air content, or temperature vary from allowable.

- C. When concrete fails to meet the acceptance criteria specified in Section 17.2, ACI 301, the Architect may order further testing of in-place concrete, in accordance with Section 17.3. When such tests are ordered, cost of testing shall be paid by Contractor.
- D. The Contractor shall bear all costs of correcting rejected work.

3.7 CONCRETE SCHEDULE

CONCRETE SCHEDULE		
ITEM OR STRUCTURE	FINISH	COMPRESSIVE STRENGTH AND OTHER REQUIREMENTS
Concrete not otherwise indicated (Class II)	RfFm-Fn SmFm-Fn, if exposed	3500 P.S.I. at 28 days Normal Weight Concrete Minimum Cementitious Material Content: ACI Minimum requirements Lightweight Concrete: Calculated Equilibrium Unit Weight: 110 lb/cu.ft, plus or minus 5 lb/cu.ft. per ASTM C567
Trench footings, footings (Class I)	RfFm-Fn SmFm-Fn, if exposed	3000 P.S.I. at 28 days Max W/C Ratio = 0.45
Foundation and retaining walls exposed to exterior (Class III)	RfFm-Fn SmFm-Fn, if exposed	4000 P.S.I. at 28 days 4.5% - 7.5% air entrainment Max W/C Ratio = 0.40
Interior formed concrete exposed to view (Class II)	SmFm-Fn	4000 P.S.I. at 28 days Max W/C Ratio = 0.50
Interior floor slabs scheduled to receive mud-set mosaic and quarry tile (Class II)	Flt-Fn	3500 P.S.I. at 28 days Mid-Range Water Reducer Required
Lean concrete fill at soft soils of over excavations (Class IV)	--	1500 P.S.I. at 28 days
Metal stair pan fill, toppings over precast deck (Class V)	--	2500 P.S.I. at 28 days #8 Aggregate (maximum)
Exposed interior floor slabs and interior slabs scheduled to receive resilient, thin film, and wood flooring finishes (Class II)	Tr-Fn1 Tr-Fn2 Tr-Fn3	3000 P.S.I. at 28 days Mid-Range Water Reducer Required
Exterior walks, stoops, steps, aprons, and curbs; exterior formed concrete exposed to view; exterior concrete not otherwise indicated (Class III)	NsBrm-Fn Grt-CI-Fn	4000 P.S.I. at 28 days 4.5% - 7.5% air entrainment Max W/C Ratio = 0.40

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A. Minimum cement content shall be as follows:

Class I:	470 pounds
Class II:	517 pounds
Class III:	564 pounds
Class IV:	376 pounds

B. Aggregate for toppings over precast deck and fill for metal stair pans shall be 3/8 inch maximum size (Class V).

◆ END OF SECTION ◆

1. PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Products and procedures for processing bonded abrasive polished concrete floors using multi-step wet/dry mechanical process, and accessories indicated, specified, or required to complete polishing.

1.2 REFERENCE STANDARDS

- A. Terminology: As defined by the following Trade Associations:
 - 1) Concrete Polishing Association of America
 - 2) American Concrete Institute.
 - 3) International Concrete Repair Institute.
- B. Polished Concrete: The act of changing a concrete floor surface, with or without aggregate exposure, to achieve a specified “finished gloss” level.
- C. Bonded abrasive polished concrete: The multi-step operation of mechanically grinding, honing, and polishing a concrete floor surface with bonded abrasives to cut a concrete floor surface and to refine each cut to the maximum potential to achieve a specified level of finished gloss.
- D. ASTM 5767 - Standard Test Method for Instrumental Measurement of Distinctness-of-Image Gloss of Coating Surfaces
- E. ASTM D523 – Standard Test Method for Specular Gloss
- F. ASTM 4039 - Standard Test Method for Reflection Haze of High-Gloss Surfaces

1.3 SUBMITTALS

- A. Product Data: Manufacturer’s technical literature for each product indicated, specified, or required. Include manufacturer’s technical data, application instructions, warranty and maintenance recommendations.
- B. Installer Qualifications: Data for company, principal personnel, experience, and training specified in PART 1 “Quality Assurance” Article.
- C. Field Quality Control – Dynamic Coefficient of Friction Test Reports: Reports of testing specified in PART 3 “Field Quality Control” Article.
- D. Maintenance Data: For inclusion in maintenance manual required by Division 01.

1. Include instructions for maintenance of installed work, including methods and frequency recommended for maintaining optimum condition under anticipated use.
2. Include precautions against cleaning products and methods which may be detrimental to finishes and performance.

1.4 QUALITY ASSURANCE

A. Certifications:

- 1) Product certificates signed by the manufacturer certifying materials comply with specified performance characteristics and criteria and physical requirements.
- 2) Current contractor's certificate signed by the manufacturer declaring contractor as a certified and approved installer of the polishing system.

B. Polisher Qualifications:

- 1) Manufacturer Qualification: Installer certified by HTC as an HTC Superfloor Certified Contractor.
- 2) Experience: Company experienced in performing specified work similar in design, products, and extent to scope of this Project; with a record of successful in-service performance; and with sufficient production capability, facilities, and personnel to produce specified work.
- 3) Supervision: Maintain competent supervisor who is at Project during times specified work is in progress and has attended HTC Academy / University within the past 24 months.

C. Dynamic Coefficient of Friction: Achieve following dynamic coefficient of friction by field quality control testing in accordance to the following standards:

- 1) ANSI A 137 American National Standards Specifications for Ceramic Tile

D. Field Mock-up: Before performing work of this Section, provide following field mock-up to verify selections made under submittals and to demonstrate aesthetic effects of polishing. Approval does not constitute approval of deviations from Contract Documents, unless such deviations are specifically approved by Architect in writing.

- 1) Coordinate size and location of field mock up with architect and owner.
- 2) Concrete shall be same mix design as schedule for Project.
- 3) Placement and finishing work shall be performed by same personnel as will place and finish concrete for Project.

- 4) Mock-up shall be representative of work to be expected.
- 5) Perform grinding, honing, and polishing work as scheduled for Project using same personnel as will perform work for Project.
- 6) Approval is for following aesthetic qualities:
 - a) Compliance with approved submittals.
 - b) Compliance with specified aggregate exposure.
 - c) Compliance with specified finished gloss level.
- 7) Obtain Architect's approval before starting work on Project.
- 8) Protect approved field mock-ups.
- 9) Maintain field mock-ups during construction in an undisturbed condition as a standard for judging completed work.
- 10) Do not demolish, alter, or remove field mock-ups until acceptable by Owner and Architect.

1.5 FIELD CONDITIONS

- A. Damage and Stain Prevention: Take precautions to prevent damage and staining of concrete surfaces to be polished.
 - 1) Prohibit the consumption of food and drinks.
 - 2) Prohibit use of markers, spray paint, and soapstone.
 - 3) Prohibit improper application of liquid membrane film forming curing compounds.
 - 4) Prohibit vehicle parking over concrete surfaces.
 - 5) Prohibit pipe cutting operations over concrete surfaces.
 - 6) Prohibit storage of any items over concrete surfaces for not less than 28 days after concrete placement.
 - 7) Prohibit ferrous metals storage over concrete surfaces.
 - 8) Protect from petroleum, oil, hydraulic fluid, or other liquid dripping from equipment working over concrete surfaces.
 - 9) Protect from acids and acidic detergents contacting concrete surfaces.
 - 10) Protect from painting activities over concrete surfaces.

- B. Environmental Limitations: Comply with manufacturer's written instructions for substrate temperature, ambient temperature, moisture, ventilation, and other conditions affecting liquid applied product application.

1.6 WARRANTY

- A. Provide 5 year performance warranty commencing at date of building substantial completion. Manufacturer shall warrant to the owner that polished surface will remain water repellent, dust-proof, hardened and abrasion resistant when properly maintained in accordance to manufacturer's maintenance program.

1.7 DELIVERY STORAGE AND HANDLING

- A. Deliver materials in original packages and containers with seals unbroken and bearing manufacturer's labels containing brand name and directions for storage and mixing with other components.
- B. Store materials to comply with manufacturer's directions to prevent deterioration from moisture, heat, cold, direct sunlight or other detrimental effects.

2. PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Basis of design shall be HTC Superfloor Polished Concrete System.
 - 1) HTC, Inc. 5617 Tazewell Pike, Knoxville, TN 37918 / P: 865.689.2311
- B. Equals by Americpolish, Husqvarna Superfloor, or approved equal.

2.2 FINISH

- A. Finish: Salt and Pepper
- B. Level of Shine: 800 Grit

2.3 PRODUCTS / SYSTEM

- A. Densifier:
 - 1) Basis of design: HTC Superfloor Densifier
 - 2) Equals by Americpolish, Husqvarna Superfloor, or approved equal.
- B. Stain Protectant:
 - 1) Basis of design: HTC Superfloor SP / HTC Superfloor PSP
 - 2) Equals by Americpolish, Husqvarna Superfloor, or approved equal.

2.4 ACCESSORIES

- A. Repair Material: A product that is designed to repair cracks and surface imperfections. The specified material must have sufficient bonding capabilities to adhere after the polishing to the concrete surface and provide abrasion resistance equal to or greater than the surrounding concrete substrate.
Acceptable products:
 - 1) Quickmender by Versa Flex
 - 2) Rapid Refloor by Meztger / McGuire
 - 3) Spall FX by Hi Tech
- B. Grout Material: HTC Grout, Americpolish Grout, Husqvarna Superfloor grout
- C. Protective Cover: Non-woven, puncture and tear resistant, polypropylene fibers laminated with a multi-ply, textured membrane, not less than 18 mils in thickness. Basis for design is ProGuard Duracover by Scofield.

2.5 POLISHING EQUIPMENT

- A. Field Grinding and Polishing Equipment:
 - 1) Basis of Design: HTC Blackline 500, 650, 800C, 800HDX, 800RX or 950RX professional floor grinder. Equals by Americpolish, Husqvarna Superfloor, or approved equal
 - 2) Basis of Design: HTC Blackline / Greyline professional dust extractor. Equals by Americpolish, Husqvarna Superfloor, or approved equal
 - 3) If wet grinding, honing, or polishing, use slurry extraction equipment suitable for slurry removal and containment prior to proper disposal.
- B. Edge Grinding and Polishing Equipment:
 - 1) Basis of Design: HTC 270EG professional floor edge grinder and polisher. Equals by Americpolish, Husqvarna Superfloor, or approved equal
- C. Diamond Tooling: Abrasive tools that contain industrial grade diamonds within a bonded matrix (such as metallic, resinous, ceramic, etc.) that are attached to rotating heads to refine the concrete substrate.
 - 1) Metal Bond Tooling:
 - a) Basis of Design: HTC SMHX series diamond tooling. Equals by Americpolish, Husqvarna Superfloor, or approved equal
 - 2) Hybrid Tooling:

- a) Basis of Design: HTC FL, Big Block or RP series diamond tooling. Equals by Americpolish, Husqvarna Superfloor, or approved equal
- 3) Resin Bond Tooling:
 - a) Basis of Design: HTC FL, RP, SR, FP, DX, REP or Fenix series diamond tooling. Equals by Americpolish, Husqvarna Superfloor, or approved equal
- 4) Abrasive Pad:
 - a) Basis of Design: HTC Twister cleaning pads. Equals by Americpolish, Husqvarna Superfloor, or approved equal

3. PART 3 – EXECUTION

3.1 INSPECTION

- A. Examine the areas and conditions where the floor finish is to be installed and notify the Architect of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until all unsatisfactory conditions have been corrected by the Contractor in a manner acceptable to the Architect.

3.2 EXAMINATION

- A. Acceptance of Surfaces and Conditions:
 - 1) Examine substrates to be polished for compliance with requirements and other conditions affecting performance.
 - a) Concrete finished floor flatness (FF) according to applicable Division 03 Section on cast-in-place concrete.
 - b) Concrete curing methods according to applicable Division 03 Section on cast-in-place concrete.
 - c) Concrete compression strength per according to applicable Division 03 Section on cast-in-place concrete.
 - 2) Proceed only when unsatisfactory conditions have been corrected in a manner complying with Contract Documents.
 - 3) Starting work within a particular area will be construed as acceptance of surface conditions.

3.3 PREPARATION

- A. Cleaning New Concrete Surfaces:
 - 1) Prepare and clean concrete surfaces.

- 2) Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, paint splatter, and other contaminants incompatible with liquid applied products and polishing.

- B. Repair any cracks, holes, or imperfections in concrete with material that is same color as concrete.

3.4 POLISHING CONCRETE FLOORS

- A. Perform all polishing procedures to ensure a consistent appearance from wall to wall.

- B. Initial Grinding:

- 1) Use Moh's hardness test to gauge hardness of concrete surface and select appropriate SMHX series diamond tooling.
- 2) Use approved HTC Grinder with selected diamond tooling.
- 3) Begin grinding in one direction using sufficient equipment and diamond tooling to meet specified aggregate exposure class.
- 4) Make sequential passes with each pass perpendicular to previous pass using finer grit tool with each pass, up to 150 grit metal bonded tooling.
- 5) Achieve maximum refinement with each pass before proceeding to finer grit tools.
- 6) Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
- 7) Continue grinding until achieving specified Aggregate Exposure.

- C. Treating Surface Imperfections:

- 1) Mix patching compound or grout material with dust created by grinding operations, manufacturer's tint, or sand to match color of adjacent concrete surfaces.
- 2) Fill surface imperfections including, but not limited to, holes, surface damage, small and micro cracks, air holes, pop-outs, and voids with grout to eliminate micro pitting in finished work.

- D. Honing:

- 1) Use approved HTC Grinder with FL, Big Block, RP, SR, FP, DX, REP or Fenix series diamond tooling.

- 2) Hone concrete in one direction starting with a 40 grit tooling and make as many sequential passes required to remove scratches, each pass perpendicular to previous pass, up to 400 grit tooling reaching maximum refinement with each pass before proceeding to finer grit tooling.
- 3) Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.

E. Densification:

- 1) Remove all dust and debris from concrete surface using an automatic floor scrubber and fresh water. Allow to dry.
- 2) Spray HTC Superfloor Densifier with overlapping circular motion. Lightly use pad applicator fitted with microfiber pad to spread evenly on surface. Product does not need vigorous scrubbing-in and will not form a gel. As product is absorbed into surface, apply additional product as needed until floor starts to reject the product. Keep floor wet for 10-15 minutes, spreading with mop to avoid puddles. Allow to dry.

F. Polishing:

- 1) Use approved HTC Grinder with FL, RP, SR, FP, DX, REP or Fenix diamond tooling.
- 2) Begin polishing in one direction starting with 800 grit tooling.
- 3) Make sequential passes with each pass perpendicular to previous pass using finer grit tooling with each pass until the specified level of gloss has been achieved.
- 4) Achieve maximum refinement with each pass before proceeding to finer grit pads.
- 5) Clean floor thoroughly after each pass using dust extraction equipment properly fitted with squeegee attachment or walk behind auto scrubber suitable to remove all visible loose debris and dust.
- 6) Stain Protection: Uniformly apply and remove excessive liquid according to manufacturer's instructions. Final film thickness should be less than .05 mils after cure.
- 7) Final Polish: Using burnishing equipment and finest grit abrasive pads, burnish to uniform reflective sheen matching approved field mock-up.

G. Final Polished Concrete Floor Aggregate Finish:

- 1) Aggregate Exposure Cream Finish: Polish cement paste resulting in little aggregate exposure and a "salt and pepper" finish

H. Final Polished Concrete Floor Gloss Finish:

- 1) Finished Gloss – Bronze / Matte Appearance:
 - a) Procedure: Recommended not less than 4 step process with full refinement of each diamond tool with one application of densifier.
 - b) Gloss Measurement: Determine the gloss by incorporating the following:
 - c) Reflective Clarity Reading (DOI): Not less than 20 according to ASTM D5767 prior to the application of sealers.
 - d) Reflective Sheen Reading (Specular Gloss): Not less than 15 according to ASTM D523 prior to the application of sealers.
 - e) Surface Profile Reading: Minimum Ra measurement 64 μin / 1.6256 μm

3.5 FIELD QUALITY CONTROL

- A. Field Testing: Engage a qualified walkway auditor to perform field testing to determine if polished concrete floor finish complies with specified coefficient of friction;
- 1) ANSI A137 for dynamic coefficient of friction

3.6 CLOSEOUT ACTIVITIES

- A. Maintenance Training:
- 1) Manufacturer Certified Contractor shall train Owner's designated personnel in proper procedures and use of HTC Twister cleaning pads for maintaining polished concrete floor.
 - 2) Manufacturer Certified Contractor shall provide Owner's designated personnel with proper HTC Superfloor / Twister polished concrete maintenance guideline, including recommended schedules, procedures, and products based on the design and use of the facility.
- B. Maintenance Procedures
- 1) Clean the floor with a dust mop.
 - 2) Use an auto scrubber with clean water, HTC Clean and Twister SuperClean diamond impregnated pad, to clean entire floor. Ensure that auto scrubber is properly vacuuming dirty water during cleaning process.
 - 3) When complete, remove the Twister pad and rinse thoroughly.

- 4) For high traffic areas, use an ultra-high speed burnisher with clean, dry Twister Supergloss (Green 3000 grit twister can be used as an alternate to Supergloss) diamond impregnated.

3.7 PROTECTION

- A. Covering: After completion of polishing, protect polished floors from subsequent construction activities with protective covering.
- 3.8 Follow manufacturer's written instruction and recommendations.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Masonry mortar and mixing masonry mortar.

- 1) Cement and lime mortar.

1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Unit Masonry – Section 04 20 00

1.3 COLD WEATHER REQUIREMENTS

A. Precondition and protect mortar as follows:

- 1) Average daily air temperature between 40° and 32°:
 - a) Heat mixing water or aggregate to minimum 70° to maximum 160°F.
- 2) Average daily air temperature below 32°:
 - a) Heat mixing water and aggregate to minimum 70° to maximum 160°F.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. All cements and lime shall be fresh and undamaged when delivered at the job, and shall be stored in tight, dry sheds, with floor off the ground.
- B. Portland Cement: ASTM C150, Type I, nonstaining, without air entrainment and of natural color or white, to produce the required color of mortar or grout. Mill certificate covering shipment shall be furnished if requested by Architect.
- C. Hydrated Lime: ASTM C207, Type S. (Type “N”, normal hydrate, will not be acceptable.)
- D. Portland Cement-Lime Mix: Packaged blend of Portland cement complying with ASTM C150, Type I or III, and hydrated lime complying with ASTM C207.
 - 1) For pigmented mortars, use colored portland cement lime mix of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigment shall not exceed 10 percent of portland cement by weight for mineral oxides nor 2 percent for carbon black.

E. Aggregates

- 1) Mason's Sands: (for other than pointing mortars): Natural Sand, ASTM C-144, with modifications of sieve analysis, as follows:
 - a) Sand for general use: Not over 10% to pass the No. 100 sieve.
 - b) Sand for mortar to be used in exposed work shall be of light color and subject to approval by the Architect.
 - c) Sand for joints ¼" or less: 100% to pass the No. 16 sieve. Note: This sand must not contain material which might stain limestone.
- 2) Silica Sand (for use in pointing mortar): White or of light color, as approved; fine, pure, silica, 100% passing the No. 16 sieve, not over 40% passing the No. 50 sieve.

- F. Water: Potable, clean, free of deleterious materials which would impair strength or bond.

2.2 MORTAR MIXES

- A. Mortar for all brick and stone veneer shall match the existing building in color and texture.
- B. Do not add admixtures including air-entraining agents, accelerators, retarders, water repellent agents, anti-freeze compounds, or other admixtures, unless otherwise indicated.
 - 1) Do not use calcium chloride in mortar or grout.
 - 2) Do not use antifreeze admixtures in mortar utilized for face brick work.
 - 3) Mortar utilized for all exterior brick and concrete block masonry shall include water repellant admixtures, to achieve class E water permeance rating with STM E514-74.
- C. Mortar for Unit Masonry : Comply with ASTM C270, Property Specification, for job mixed mortar, of types indicated below per Brick Institute of America, Technical Notes on Brick Construction; 8A, Table A1.

Location	Building Segment	Mortar Type
Exterior, above grade	loadbearing wall nonloadbearing wall parapet wall, chimney and veneer wall	S N N
Exterior, at or below grade	foundation wall, retaining wall, manholes, sewers, pavements, walks and patios	S
Interior	loadbearing wall nonloadbearing partitions	N O

3. PART 3 - EXECUTION

3.1 MIXING AND BATCHING

- A. Use methods of measuring so that specific proportioning can be accurately controlled and maintained. Sand shall be measured damp and loose.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Masonry grout and mixing masonry grout.

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Unit Masonry – Section 04 20 00

1.3 COLD WEATHER REQUIREMENTS

- A. Precondition and protect grout as follows:
 - 1) Average daily air temperature between 40° and 32°:
 - a) Heat mixing water or aggregate to minimum 70° to maximum 160°.
 - 2) Average daily air temperature below 32°:
 - a) Heat mixing water and aggregate to minimum 70°F to maximum 160°F.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type I.
- B. Fine Aggregates: ASTM C404, clean, sharp, natural sand free from loam, clay lumps, or other deleterious substances.
- C. Coarse Aggregates: ASTM C404, clean, uncoated, pea gravel containing no clay, mud, loam, or foreign matter. Maximum aggregate size 3/4 inch.
- D. Water: Clean, potable, free of deleterious materials which should impair strength or bond.

2.2 GROUT MIXES

- A. Grout mixes shall be plant mix or factory blended (dry mix with water added at the site).
- B. Do not lower the freezing point of grout by use of admixtures or anti-freeze agents.
 - 1) Do not use calcium chloride in grout.

- C. Grout for Unit Masonry: Comply with ASTM C476.
 - 1) Fine Grout: 2500 psi average compressive strength at 28 days for 6 inches and smaller hollow concrete masonry units and between 2 wythes of masonry where space is less than 2 inches in width.
 - 2) Coarse Grout: 2500 psi average compressive strength at 28 days for 8 inches and larger hollow concrete masonry units and between 2 wythes of masonry where space is 2 inches in width or wider.
- D. Grout Proportions (by volume): Comply with Table 1, ASTM C476.
 - 1) Fine Grout: 1 part Portland cement, 0 to 1/10 part hydrated lime or lime putty, 2-1/4 to 3 parts fine aggregate.
 - 2) Coarse Grout: 1 part Portland cement, 0 to 1/10 part hydrated lime or lime putty, 2-1/4 parts fine aggregate, 1 to 2 parts coarse aggregate.
- E. Grout Slump
 - 1) Properly proportioned grout shall have a slump of 8 to 10 inches.

3. PART 3 - EXECUTION

- A. MIXING AND BATCHING
 - 1) Use methods of measuring so that specific proportioning can be accurately controlled and maintained. Sand shall be measured damp and loose.

◆ END OF SECTION ◆

MASONRY ANCHORAGE AND REINFORCING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Masonry anchorage and reinforcement devices.
- B. Continuous joint reinforcing and ties for masonry.
- C. Individual metal ties for masonry
- D. Anchoring devices for masonry
- E. Reinforcing bars
- F. Intersecting masonry wall joint reinforcing
- G. Adhesive anchors bolts

1.2 RELATED WORK SPECIFIED ELSEWHERE

- A. Unit Masonry – Section 04 20 00

1.3 MANUFACTURERS

- A. Refer to individual product item.

1.4 SUBMITTALS

- A. Submit product data for each item.

2. PART 2 - PRODUCTS

2.1 REINFORCING

- A. All joint reinforcing, wire ties, anchors, adjustable ties, etc. shall be mill galvanized coating. Hot dip shall be required on exterior walls.

2.2 CONTINUOUS WIRE REINFORCING AND TIES FOR MASONRY

- A. Provide welded wire units prefabricated in straight lengths of not less than 10 foot, with matching prefabricated corner ("L") and intersection ("T") units for all exterior wall corners and intersections and all interior load bearing wall corners and intersections. Standard straight reinforcing clipped and bent around corner will not be acceptable.
- B. Fabricate from cold-drawn steel wire complying with ASTM A82, with deformed or embossed continuous side rods and plain cross-rods, with unit width of 1-1/2 to 2 inches less than thickness of wall or partition.
- C. Wire shall be mill galvanized and in accord with the following:
 - 1) Joint reinforcement, interior walls - ASTM A641 Class 3 (0.80 oz. per sq.ft.)

- 2) Wire ties or anchors in exterior walls completely embedded in mortar or grouts - ASTM A641 Class 3 (0.80 oz. per sq. ft)
 - 3) Wire ties or anchors in exterior walls not completely embedded in mortar or grout (includes cavity walls) - ASTM A153 Class B3 (1.30 oz. per sq. ft)
 - 4) Joint reinforcement in exterior walls on interior walls exposed to moist environments (shower, kitchen and dishwashing area) - ASTM A153 Class B3 (1.30 per sq. ft)
- D. For single wythe and composite masonry, provide ladder type joint reinforcing fabricated with a minimum two 9 gauge steel side rods and 9 gauge cross rod.
- 1) Manufacturers
 - a) Dur-o-Wall, Inc. "D/A 320 Ladur" or equal by National Wire Products Co., or A.A. Wire Products Co.

2.3 REINFORCING BARS

A. Reinforcing Bars

- 1) Where No. 3 and larger are required, they shall be deformed steel, conforming to ASTM A615, Grade 60.
- 2) Use #3 spacer bars at 48 inch spacing connected to longitudinal reinforcing bars in concrete masonry bond beams to hold bars in proper location.

2.4 INTERSECTING MASONRY WALL JOINT REINFORCING

- A. Horizontal bed joint reinforcement for conditions where non-bearing masonry walls intersect other masonry walls at 90 degrees shall be wire mesh wall ties made of 1/2 inch mesh by 16 gauge hot dip mill-galvanized wire, 1 inch less in width than width of wall and extending 8 inches minimum into each wall or within 2 inches of opposite face of perpendicular walls.
- B. The mesh shall be spaced not more than 16 in. apart vertically. When one wall is constructed first, the mesh shall be built into the wall and later embedded in the mortar joints of the second wall.

2.5 ANCHORING DEVICES FOR MASONRY

- A. Rigid Anchors: Where masonry is to be rigidly anchored to structural steel beams, provide galvanized steel straps, bars or rods welded to the steel beam and extending into the mortar joint. Straps shall be not less than 14 gauge in thickness. Bars and rods shall be not less than 1/4 inch in diameter.

2.6 ADHESIVE ANCHOR BOLTS

A. In hollow CMU:

- 1) Adhesive anchor systems with nylon or stainless steel screen inserts. Use 1/2 inch diameter anchors with 4-1/4 inch embedment. (Minimum allowable shear 900 pounds; minimum allowable tension 250 pounds/anchor.)

B. In solid grouted CMU:

- 1) Adhesive anchor systems. Use 1/2 inch diameter anchors with 4-1/4 inch embedment; (minimum allowable shear 2600 pounds; minimum allowable tension 2000 pounds/anchor).

3. PART 3 - EXECUTION

3.1 LOCATION OF JOINT REINFORCEMENT

A. General

- 1) Install reinforcing in every second course, not to exceed 16" vertical spacing, in all interior and exterior walls. Install reinforcing in stack bonded units 8" vertical spacing.
- 2) Place in first and second bed joints immediately above and below wall openings.
- 3) Joint reinforcement at openings should extend not less than 24 inches, or to the end of the panel, whichever is the smallest.
- 4) Place in 2 courses immediately below the top of all load bearing walls.
- 5) Place in course immediately below the top of all non-load bearing walls.
- 6) Place galvanized mesh wall ties at all intersecting masonry walls.
- 7) Joint reinforcement shall be interrupted at control joints and at expansion joints.
- 8) Joint reinforcement is not required between openings where the relationship of distance between openings (L) and openings height (H) is not more than shown in National Concrete Masonry Association TEK 10-1, Table 1.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Manufactured clay masonry unit; concrete masonry units; both loadbearing and nonloadbearing and intended for use in unit masonry assemblies with mortar along with masonry accessories.

- 1) Concrete masonry units
- 2) Miscellaneous accessories

1.2 RELATED WORK

- A. Masonry Mortar - Section 04 05 13
- B. Masonry Grout - Section 04 05 16
- C. Masonry Anchorage and Reinforcement - Section 04 05 19

1.3 QUALITY ASSURANCE

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress. When work is resumed, top surface of work shall be cleaned of all loose mortar.
 - 1) Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
 - 2) Where one wythe of multiwythe masonry walls is completed in advance of other wythes, secure cover a minimum of 24 inches (600 mm) down face next to unconstructed wythe and hold cover in place.
- B. Cold Weather Requirements: No frozen materials or materials mixed or coated with ice or frost shall be used. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with NCMA TEK 3-1A . Precondition and protect concrete masonry units as follows:
 - 1) Average daily air temperature between 40° and 32°F:
 - a) Protect masonry from rain or snow for 24 hours.
 - 2) Average daily air temperature between 32° and 25°F.
 - a) Provide heat sources on both sides of masonry construction.
 - b) Wind breaks are required for wind in excess of 15 miles per hour velocity.
 - c) Cover masonry completely with insulating blankets for 24 hours.

3) Average daily air temperature below 25°F

- a) Provide enclosures and heat to maintain air temperature above 32°F.
- b) Temperature of masonry units shall be minimum 30°F when laid.
- c) Maintain masonry temperature above 32°F for 24 hours by enclosures and supplemental heat.

1.4 NOT FURNISHED, BUT INSTALLED

- A. Include, but not be limited to, the building into masonry of all bolts, anchors, nailing blocks, inserts, door and window frames, vents, conduits, etc., furnished under Sections or Divisions of the Specifications. Consult other trades in advance to avoid cutting and patching.

1.5 DELIVERY, STORAGE OF MATERIALS

- A. Stack all masonry units in a dry place, off the ground on a prepared plank platform. Protect stacked units by a shed roof or tarpaulin, arranged to allow for circulation of air around the units and to protect the units from weather, moisture and neglect.
- B. Deliver architectural concrete masonry banded on wood pallets with exposed ground face protected by a plastic layer and top outside edges protected by a premolded edge protector. Store in single-stacks.

1.6 BUILT IN WORK

- A. Set lintels in full beds of mortar. Fill solid with mortar around jambs and heads of metal door bucks and frames.

1.7 DAMAGED UNITS

- A. Handle units carefully. Units with chipped edges, spalls, or other damage to their appearance which would show in the finish walls, shall not be built into the work.

1.8 MANUFACTURERS

- A. Kuhlman Corporation, Tri County Brick and Block, National Block Company or approved equal.

2. PART 2 - PRODUCTS

2.1 CONCRETE MASONRY UNITS

- A. Concrete Masonry Units: ASTM C 90 and as follows:
 - 1) Unit Compressive Strength: Provide units with minimum average net area compressive strength indicated below.

- a) 1900 psi (13.1 Mpa).
- 2) Provide Type I, moisture controlled, normal weight for hollow concrete masonry units.
- 3) Provide Type 1, moisture controlled, normal weight for solid concrete masonry units.

2.2 SPLIT FACE MASONRY UNITS

- A. Provide architectural split face concrete units at all top of foundation wall locations where the block will be exposed. See wall sections.
- B. Color: To be chosen from manufacturers standard colors.

2.3 MISCELLANEOUS

- A. Grout Stop
 - 1) Fiberglass, galvanized steel, or polypropylene screen.
 - 2) Manufacturers
 - a) Dur-o-Wall, Inc., National Wire Products Co., or A.A. Wire Products Co. or approved equal.
- B. Caging Devices and Centering Clips
 - 1) In hollow concrete masonry cores or brick cavities to be reinforced with vertical reinforcing steel bars and filled with grout, provide 9 gauge galvanized steel caging devices.
 - 2) Manufacturers
 - a) Dur-o-Wall, Inc., National Wire Products Co., or A.A. Wire Products Co., or approved equal.

3. PART 3 - EXECUTION

3.1 LAYING CONCRETE MASONRY UNITS

- A. Build wall plumb, true and level, to the thickness shown on drawings.
- B. Concrete masonry units that are exposed in walls, either natural finish or painted, shall have a uniform texture reasonably close to samples approved by the Architect. They shall be free of imperfections in the surface which would impair the finished appearance.

- C. Do not lay masonry in freezing weather unless suitable means are provided to heat materials, protect work from cold and frost and ensure that mortar will cure without freezing.
- D. Fill face shell and end joints with mortar and joints shall be squeezed tight. Slushing of mortar into joints shall not be permitted. The first course of block and all solid units shall be laid in a full bed of mortar.
- E. The masonry units shall not be damaged prior to laying but shall be laid up in the dry state.
- F. Bond each course of corners and break vertical joints of cut filler units at least 2 inches. Fill in with concrete brick where concrete block units cannot be used.
- G. Provide recesses or openings as required for all built-in items.
- H. Cut masonry units exposed with a motor-driven saw. Make all cuts required for architectural concrete masonry with a motor-driven masonry saw. Blade type as per manufacturer's recommendations.
- I. Provide 1" bullnose corners for all external corners unless shown otherwise on drawings.
- J. Masonry walls in location where they may be exposed to high winds during erection, shall not be built higher than 10 times their thickness unless adequately braced or until provision is made for the prompt installation of permanent bracing at the floor or roof level immediately above the story under construction. Backfill shall not be placed against foundation walls until they have been braced to withstand the horizontal pressure.
- K. Where masonry bonded hollow walls, or walls of hollow masonry units are decreased in thickness, not less than one course of solid masonry shall be interposed between the wall below and the thinner wall above, or special units of construction shall be used to properly transmit the loads from the shells of the units above to the shells of those below.
- L. Keep clean daily all masonry units during installation using brushes, rags, and burlap squares. Do not allow excess mortar lumps or smears to harden on the finished surfaces. Remove green mortar with burlap or a dry cloth. Harsh cleaning methods after walls have been erected might mar the surface appearance of the units. Do not continuously expose units to temperatures above 250°F.

3.2 JOINTS

- A. Exposed to view joints on all concrete masonry units shall have concave face. Make joints uniform in width, approximately 3/8", cut flush and after initial set, tool joints compressing mortar to a concave joint. Use a tool of sufficient length (not less than 20") to produce a uniform concave joint free from waves.

3.3 SPECIAL UNITS

- A. Provide and place all special concrete masonry units required or as shown on drawings, including solid units, bond beam units, lintel units, sash jamb units, plain end units, bullnose corner units, etc. Where such units are not available they shall, where possible be cut using a power masonry saw.
- B. At the tops of all walls and under joists, beams or other concentrated loads, solid blocks shall be provided unless a bond beam or other detail is shown.
- C. Where noted, the top course may be filled with concrete, in which case a grout stop shall be placed in the joint below to positively hold the concrete when rodded into the core spaces. See Section 04 05 16.
- D. Place all anchor bolts for wood plates, setting them in mortar, and make provisions for building-in of other details and appurtenances shown on the drawing. See Section 04 05 19.

3.4 INTERSECTING WALLS

- A. For tying non-bearing walls to other walls, strip of $\frac{1}{2}$ " mesh galvanized hardware cloth shall be placed across the joint between the two walls. See Section 04 05 19.
- B. If the joint where two masonry walls meet is to be exposed to view, the mortar shall be raked out to a depth of $\frac{3}{4}$ " to receive sealant according to Section 07 92 00.

3.5 CAULKING RECESSES

- A. Outside joints around the perimeter of exterior door and window frames or other wall openings shall not be less than $\frac{1}{4}$ " nor more than $\frac{3}{8}$ " wide, and cleaned out to a uniform depth of at least $\frac{3}{4}$ " ready for placement of caulking.

3.6 POINTING AND CLEANING

- A. On completion, point up all exposed masonry, fill all holes and joints, remove loose mortar, cut out defective joints and re-point where necessary. Clean exposed masonry surfaces either painted or unpainted.
- B. Do not use metal cleaning tools and brushes or abrasive powders.

◆ END OF SECTION ◆

CALCIUM SILICATE MANUFACTURED STONE MASONRY

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Calcium silicate masonry units that are to be single sourced.
- B. Installation Products; Adhesives, mortars, grouts and sealants.
- C. Air and water barrier
- D. Scope of work – Provide manufactured adhered veneer (units size thickness ranging from a minimum 1/4" [6mm] up to a maximum 2-5/8" [65mm] according to IBC – Chapter 14 Exterior Walls or applicable local building codes for thin adhered masonry veneer), veneer installation materials and accessories as indicated on drawings, as specified herein, and as needed for complete and proper installation.

1.2 RELATED SECTIONS

- A. Section 04 05 13 - Masonry Mortaring.
- B. Section 04 05 19 - Masonry Anchorage and Reinforcing.

1.3 REFERENCES

- A. ASTM C73: Standard Specification for Calcium Silicate Face Brick.

1.4 SUBMITTALS

- A. Samples: Three full size samples, illustrating color and texture.
- B. Profile drawings and manufacturers product data.
- C. Proof of warranty

1.5 WARRANTY

- A. The Contractor warrants the work of this Section to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for a period of 15 years. The manufacturer of adhesives, liquid air and water barrier, mortars, pointing mortars and other installation materials shall provide a written twenty five (25) year warranty, which covers materials and labor.
 - 1) For basis of design reference LATICRETE Warranty Data Sheet 230.15SPD for complete details and requirements.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: manufacturer having sufficient plant facilities to produce the shapes, quantities and size of Products required in accordance with the project schedule.
- B. Installer: Company or person specializing in commercial masonry work.

1.7 DELIVERY, STORAGE AND HANDLING

- A. Deliver calcium silicate masonry units in protective film. Prevent damage to units.
- B. Lift skids with proper and sufficiently long slings or forks with protection to prevent damage to units. Protect edges and corners.
- C. Store units in a manner designed to prevent damage and staining of units.
- D. Stack units on timbers or platforms at least 3 inches above grade.
- E. Place polyethylene or other plastic film between wood and other finished surfaces of units when stored for extended periods of time.
- F. Cover stored units with protective enclosure if exposed to weather.
- G. Do not use salt or calcium-chloride to remove ice from masonry surfaces.

1.8 SYSTEM DESCRIPTION

- A. Thin Adhered CSMU Building Stone installed over wood framing, wood sheathing, air and water barrier, drainage mat, latex portland cement mortar and portland cement pointing mortar.

2. PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers of calcium silicate masonry units having Products considered acceptable for use:
 - 1) Arriscraft Coastal Series, Cape Cod. (Basis of Design)
 - a) Note: Final Color and Stone design selection to be selected by Architect
 - 2) As long as they meet all requirements of these specifications Tri County, Kuhlman Corporation and NG Stone; Sierra are approved equals.
 - 3) All equals to be submitted and approved by architect prior to bidding.

- B. Manufactures of adhered masonry veneer installation materials and accessories having products considered acceptable for use:

- 1) Laticrete International
- 2) As long as they meet all requirements of these specifications Tri County and Kuhlman Corporation are approved equals.
- 3) All equals to be submitted and approved by architect prior to bidding.

2.2 ADHERED MASONRY VENEER MATERIALS

- A. Thin Adhered Calcium Silicate Building Stone Masonry Units (Thin Adhered CSMU) (Georgia): to ASTM C73, Grade SW; solid units that have been pressure formed and autoclaved; special shapes as indicated; three-size configuration; as follows:

- 1) Modular Sizes:
 - a) COA21: 2-1/8" high, 1-1/2" bed, fragmented lengths up to 23-5/8".
 - b) COA35: 3-5/8" high, 1-1/4" bed, fragmented lengths up to 23-5/8".
 - c) COA62: 6-1/8" high, 1-1/8" bed, fragmented lengths up to 23-5/8".
- 2) Texture: match existing] finish on exposed faces;
- 3) Color: Final Color Selection to be Selected by Architect
- 4) Basis of design: Coastal Series by Arriscraft.
- 5) Approved equals: See 2.1.A.2

2.3 DRAINAGE MAT

- A. Drainage Mat: Cosella Dorken Delta-Dry to be attached through Laticrete Air and Water Barrier to substrate. Equals by Driwall and ClarkDietrich.

- 1) Material Thickness (ASTM D1777): 0.022" (0.55mm)
- 2) Overall Thickness (D1777): 0.3" (7.53mm)

2.4 CEMENT BOARD

- A. Backer Board: Cementitious, water durable, board; surfaced with fiberglass reinforcing mesh on front and back; long edges wrapped; and complying with ANSI A118.9 and ASTM C 1325

- 1) Thickness: 5/8 in.

- 2) Width: 4 ft.
- 3) Length: 8 ft.
- 4) Edges: Tapered.
- 5) Compression Strength: Not less than 2250 lbs. per sq. in. when tested in accordance with ASTM D 2394.
- 6) Water Absorption: Not greater than 8 percent when tested for 24 hours in accordance with ASTM C 473.

B. Fasteners:

- 1) Screws: Hi-Lo thread screws (No. 8) wafer head, corrosion-resistant, 2-1/4 in in length, and complying with ASTM C 1002

C. Joint Treatment:

- 1) Tape: Alkali-resistant fiberglass mesh tape intended for use with cement board.

D. Bonding Materials:

E. Mortar: Latex-portland cement mortar in accordance with ANSI A118.4.

2.5 VENEER INSTALLATION MATERIALS AND ACCESSORIES

A. Air and Water Barrier Membrane: to be thin, cold applied, single component liquid and load bearing. Waterproofing Membrane to be non-toxic, non-flammable, and non-hazardous during storage, mixing, application and when cured:

- 1) Air Barrier Test (AC 212): pass
- 2) Air Permeance (ASTM E2178): Pass
- 3) Elongation @ break (ASTM D751): 20-30%
- 4) 7 day Tensile Strength (ANSI A118.10): >265 psi (1.8 MPa)
- 5) 7 day Shear Bond Strength (ANSI A118.10) >200 psi (1.4 MPa)
- 6) 28 Day Shear Bond Strength (ANSI A118.4): >214 psi (1.48 – 2.4 MPa)
- 7) Service Rating (TCA/ASTM C627): Extra Heavy
- 8) Total VOC Content:< 0.05 mg/m³

B. Epoxy Waterproofing Flashing Mortar: to be 3 component epoxy, trowel applied

specifically designed to be used under adhered masonry veneer:

- 1) Breaking Strength (ANSI A118.10): 450-530 psi (3.1-3.6 MPa)
 - 2) Waterproofness (ANSI A118.10): No Water penetration
 - 3) 7 day Shear Bond Strength (ANSI A118.10): 110-150 psi (0.8-1 MPa)
 - 4) 28 Day Shear Bond Strength (ANSI A118.10): 90-120 psi (0.6–0.83 MPa)
 - 5) 12 Week Shear Bond Strength (ANSI A118.10): 110-130 psi (0.8-0.9 MPa)
 - 6) Total VOC Content: <3.4 g/L
- C. Cementitious backer board units: size, thickness and installation as specified by cement backer board manufacturer, complying with ANSI A118.9.
- D. Latex-Portland Cement Mortar for leveling beds and scratch/plaster coats: to meet the following physical requirements:
- 1) Compressive Strength (ANSI A118.4 Modified): >4000 psi (27.6 MPa)
 - 2) Water Absorption (ANSI A118.6): $\leq 5\%$
 - 3) Service Rating (TCA/ASTM C627): Extra Heavy
 - 4) Smoke & Flame Contribution (ASTM E84 Modified): 0
 - 5) Total VOC Content: < 0.05 mg/m³
- E. Latex Portland Cement Mortar: to be weather, frost, shock resistant, non-flammable and meet the following physical requirements:
- 1) Compressive strength (ASTM C109): >2000 psi (13.8 MPa)
 - 2) Shear Bond strength (ANSI A118.11): 160 – 180 psi (1.0 – 1.1 MPa)
 - 3) Sag on Wall (ISO 13007-2): 0.25 mm
 - 4) Smoke & Flame Contribution (ASTM E84 Modified): 0
 - 5) Total VOC Content : < 0.05 mg/m³
- F. Expansion and Control Joint Sealant: to be a one component, neutral cure, exterior grade silicone sealant and meet the following requirements:
- 1) Tensile Strength (ASTM C794): 280 psi (1.9 MPa)
 - 2) Hardness (ASTM D751; Shore A): 25 (colored sealant) /15 (clear sealant)

- 3) Weather Resistance (QUV Weather-ometer):10000 hours (no change)

2.6 FABRICATION TOLERANCES

- A. Fabricate calcium silicate masonry units to the following tolerances:
 - 1) Unit Length: plus or minus 1/16".
 - 2) Unit Height: plus or minus 1/16".
 - 3) Deviation From Square: plus or minus 1/16", with measurement taken using the longest edge as the base.
 - 4) Bed Depth: plus or minus 1/8".
 - 5) Custom Unit Dimensions: plus or minus 1/8".

2.7 SOURCE QUALITY CONTROL

- A. Test compressive strength and absorption from specimens selected at random from plant production.

3. PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions are ready to receive work.
- B. Inspect materials for fit and finish prior to installation. Do not set unacceptable units.
- C. Beginning of installation means acceptance of existing conditions.

3.2 CUTTING MASONRY UNITS

- A. Cut masonry units with wet-saw.
- B. Pre-soak units using clean water prior to cutting.
- C. Clean cut units using a stiff fibre brush and clean water. Allow units to surface dry prior to placement.
- D. Finish cut edges to match face when exposed in wall.

3.3 COURSING

- A. Place masonry to lines and levels indicated.
- B. Maintain masonry courses to uniform width. Make vertical and horizontal joints equal and of uniform thickness.

- C. Lay masonry units random pattern to match existing.
- D. Maintain mortar joint thickness to match existing
- E. Tool joints when thumbprint hard, to match existing

3.4 FIELD QUALITY CONTROL

- A. Architect Inspection: Architect will inspect installed masonry and reject masonry that is chipped, cracked, or blemished (streaked, stained or otherwise damaged), as described below.
 - 1) Masonry will be inspected to be free of cracks or other blemishes on the finished face or front edges of the masonry units exceeding 3/8 inch or that can be seen from a distance of 10 feet.
 - 2) Units shall exhibit a texture approximately equal to the approved sample when viewed under diffused daylight illumination at a 20 foot distance.
 - 3) Minor chipping resulting from shipment and delivery shall not be grounds for rejection. Minor chips shall not be obvious under diffused daylight illumination from a 20 foot distance.
 - 4) Efflorescence will not be cause for rejection.
- B. Make Good rejected masonry as directed by Architect.

3.5 ADJUSTING AND CLEANING

- A. Clean a 100 square foot area of wall designated by Architect as directed below and leave for one week. If no harmful effects appear, all objectionable stains have been removed and after mortar has set and cured, clean masonry as follows:
 - 1) Protect windows, sills, doors, trim and other work from damage.
 - 2) Remove large particles with stiff fiber brushes without damaging surface.
 - 3) Saturate masonry with clean water and flush off loose mortar and dirt.
 - 4) Dilute cleaning agent with clean water in controlled proportions.
 - 5) Apply solution to pre-soaked wall surface using soft-bristled brush.
 - 6) Thoroughly rinse cleaning solution and residue from wall surface.
- B. Use alternative cleaning solutions and methods for difficult to clean masonry only after consultation with masonry unit manufacturer.

3.6 PROTECTION

- A. Protect units from damage resulting from subsequent construction operations.
- B. Use protection materials and methods which will not stain or damage units.
- C. Remove protection materials upon Substantial Completion, or when risk of damage is no longer present.

3.7 SUBSTRATE EXAMINATION

- A. Verify site conditions are ready to receive work.
- B. Inspect finish materials for fit and finish prior to installation. Do not set unacceptable units.
- C. Beginning of installation means acceptance of existing conditions.
- D. Verify that surfaces to be covered with adhered masonry veneer, brick, stone, trim or waterproofing are: Sound, rigid and conform to good design/engineering practices;
 - 1) Systems, including the framing system (including lateral bracing, purlins, battens and other framing member stiffeners), flashings, water resistive barriers, air barriers, exterior rated sheathing panels, cement backer unit panels, wire lath over which adhered masonry veneer or stone will be installed shall be in conformance with the International Building Code (IBC), and local building codes. The project design should include the intended use and necessary allowances for the expected live load, concentrated load, impact load, and dead load including the weight of the finish and installation materials while maintaining the maximum allowable deflection standard of L/600 under total anticipated load;
 - 2) Clean and free of dust, dirt, oil, grease, sealers, curing compounds, laitance, efflorescence, form oil, loose plaster, paint, and scale;
 - 3) Adhered Masonry Veneer installations have a specified subsurface tolerance, for instance $\frac{1}{4}$ " in 10' (6mm in 3m) and $\frac{1}{16}$ " in 1' (1.5mm in 300mm), to conform with the ANSI specifications. Because medium-bed mortars are not intended to be used in truing or leveling the work of others, the subsurface typically should not vary by more than $\frac{1}{16}$ " over 1' (1.5mm over 300mm), nor more than $\frac{1}{32}$ " (0.8mm) between adjoining edges where applicable (e.g. between sheets of cement backer board or between adjacent concrete masonry units). Should the architect/designer require a more stringent tolerance (e.g. $\frac{1}{8}$ " in 10' [3mm in 300mm]), the subsurface specification must reflect that tolerance, or the adhered masonry veneer specification must include a specific and separate requirement to bring the $\frac{1}{4}$ " (6mm) subsurface tolerance into compliance with the $\frac{1}{8}$ " (6mm) tolerance desired;
 - 4) Not leveled with gypsum or asphalt based compounds;

- 5) Dry as per American Society for Testing and Materials (ASTM) D4263 “Standard Test for Determining Moisture in Concrete by the Plastic Sheet Method.”

- E. Advise General Contractor and Architect of any surface or substrate conditions requiring correction before adhered masonry veneer work commences.
Beginning of work constitutes acceptance of substrate or surface conditions.

3.8 SURFACE PREPARATION

- A. Install DRAINAGE MAT and Air & Water Barrier over the exterior grade primary sheathing. Install in accord with drainage mat manufacturers installation instructions.
- B. CEMENT BACKER UNIT SUBSTRATE
 - 1) Install exterior rated cement backer units in accord with cement backer unit manufacturer's installation instructions and ANSI A118.11. All elements used in the assembly must be rated for exterior use. Installation of cement backer units and primary sheathing in accordance with design requirements.

3.9 INSTALLATION ACCESSORIES

- A. Install the air and waterproofing membrane in compliance with current revisions of ANSI A108.1 (2.7 Waterproofing) and ANSI A108.13 and manufacturers recommendations. Review the installation and plan the application sequence.

3.10 INSTALLATION – ADHERED MASONRY VENEER

- A. General: Install in accordance with current versions of American National Standards Institute, Inc. (ANSI) “A108 American National Standard Specifications for Installation of Ceramic Tile” and TCNA “Handbook for Ceramic Tile Installation.” Cut and fit adhered masonry veneer neatly around corners, fittings, and obstructions. Perimeter pieces to be minimum half unit, brick or stone. Chipped, cracked, split pieces and edges are not acceptable. Make joints even, straight, plumb and of uniform width to tolerance +/- 1/16" over 8' (1.5mm in 2.4m). Install divider strips at junction of flooring and dissimilar materials.
- B. Direct Adhere Method to Install Masonry Veneer: Install latex portland cement mortar in compliance with current revisions of ANSI A108.02 (3.11), A108.1B and ANSI A108.5. Use the appropriate trowel notch size to ensure proper bedding of the adhered masonry veneer, selected so that 100% coverage of the back surface of the Thin Adhered CSMU is achieved. Work the latex portland cement mortar into good contact with the substrate and comb with notched side of trowel. Spread only as much latex portland cement mortar as can be covered while the mortar surface is still wet and tacky. When installing large format (>8" x 8"/200mm x 200mm) units, spread latex portland cement mortar onto the back of

(i.e. 'back-butter') each piece/unit in addition to troweling latex portland cement mortar over the substrate. Beat each piece/unit into the latex portland cement mortar with a beating block or rubber mallet to insure 100% full bedding and flatness. Allow installation to set until firm. Clean excess latex portland cement mortar from adhered masonry veneer face and joints between pieces.

- C. C. Pointing Joints: Polymer Fortified Pointing Mortar - for joint widths $\geq 1/16"$ (1.5mm) and $\leq 1"$ (25mm)]; Allow Thin Adhered CSMU veneer to cure a minimum of 24 hours @ 70° F (21°C). Verify grout joints are free of dirt, debris, wedges or spacers. Sponge or wipe dust/dirt off veneer face and remove any water standing in joints. Surface temperature must be between 40-90° F (4-32°C).
- D. Expansion and Control Joints: Provide control or expansion joints as located in contract drawings and in full conformity, especially in width and depth, with architectural details.
- 1) Substrate joints must carry through, full width, to surface of adhered masonry veneer.
 - 2) Install expansion joints in adhered masonry veneer work over construction/cold joints or control joints in substrates.
 - 3) Install expansion joints where adhered masonry veneer abut restraining surfaces (such as perimeter walls, curbs, columns), changes in plane and corners.
 - 4) Joint width and spacing depends on application - follow TCNA "Handbook for Ceramic Tile Installation" Detail "EJ-171 Expansion Joints" or consult sealant manufacturer for recommendation based on project parameters.
 - 5) Joint width: $\geq 1/8"$ (3mm) and $\leq 1"$ (25mm).
 - 6) Joint width: depth ~2:1 but joint depth must be $\geq 1/8"$ (3mm) and $\leq 1/2"$ (12mm).
 - 7) Layout (field defined by joints): 1:1 length: width is optimum but must be $\leq 2:1$. Remove all contaminants and foreign material from joint spaces/surfaces, such as dirt, dust, oil, water, frost, setting/grouting materials, sealers and old sealant/backer. Use LATICRETE Latasil™ 9118 Primer for underwater and permanent wet area applications, or for porous stone (e.g. limestone, sandstone etc...) installations. Install appropriate backing material (e.g. closed cell backer rod) based on expansion joint design and as specified in § 07920. Apply masking tape to face of adhered masonry veneer, brick or stone veneer. Use caulking gun, or other applicator, to completely fill joints with sealant. Within 5-10 minutes of filling joint, 'tool' sealant surface to a smooth finish. Remove masking tape immediately after tooling joint. Wipe smears or excess

sealant off the face of adhered masonry veneer or other absorptive surfaces immediately.

- E. Adjusting: Correction of defective work for a period of one (1) year following substantial completion, return to job and correct all defective work. Defective work includes, without limitation, adhered masonry veneer units stones broken in normal abuse due to deficiencies in setting bed, loose grout, and all other defects which may develop as a result of poor workmanship.

3.11 CLEANING

- A. Clean excess mortar/epoxy from veneer surfaces with water before they harden and as work progresses. Do not contaminate open grout/caulk joints while cleaning. Sponge and wash veneers diagonally across joints. Do not use acids for cleaning. Polish with clean dry cloth. Remove surplus materials and leave premises broom clean.

3.12 PROTECTION

- A. Protect finished installation as required to protect product until construction completion. Close areas to other trades and traffic until adhered masonry veneer being installed has set firmly. Cure work in swimming pools, fountains and other continuous immersion applications for 14 days for latex portland cement based pointing mortar @ 70°F (21°C) before flood testing or filling installation with water. Extend period of protection of veneer work at lower temperatures, below 60°F (15°C), and at high relative humidity (>70% R.H.) due to retarded set times of mortar/adhesives. Replace or restore work of other trades damaged or soiled by work under this section.

◆ END OF SECTION ◆

1. 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:
- B. Steel tube railings.

1.3 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 anchorages for railings. 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.
- C. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

1.4 ACTION SUBMITTALS

- A. Product Data: For the following:
 - 1) Manufacturer's product lines of mechanically connected railings.
 - 2) Railing brackets.
 - 3) Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
- C. Samples: For each type of exposed finish required.
 - 1) Sections of each distinctly different linear railing member, including handrails, top rails, posts, and balusters.
 - 2) Fittings and brackets.

- 3) Assembled Sample of railing system, made from full-size components, including top rail, post, handrail, and infill. Sample need not be full height.
 - a) Show method of connecting and finishing members at intersections.
- D. Delegated-Design Submittal: For railings, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1.5 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For testing agency.
- B. Welding certificates.
- C. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
- D. Paint Compatibility Certificates: From manufacturers of topcoats applied over shop primers certifying that shop primers are compatible with topcoats.
- E. Product Test Reports: For pipe and tube railings, for tests performed by a qualified testing agency, according to ASTM E 894 and ASTM E 935.
- F. Evaluation Reports: For post-installed anchors, from ICC-ES.

1.6 QUALITY ASSURANCE

- A. 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."

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

2. PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain each type of railing from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer certified to practice in the state of Ohio, to design railings, including attachment to building construction.
- B. Structural Performance: Railings, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1) Handrails and Top Rails of Guards:
 - a) Uniform load of 50 lbf applied in any direction.
 - b) Concentrated load of 200 lbf applied in any direction.
 - c) Uniform and concentrated loads need not be assumed to act concurrently.
 - 2) Infill of Guards:
 - a) Concentrated load of 50 lbf applied horizontally on an area of 1 sq. ft.
 - b) Infill load and other loads need not be assumed to act concurrently.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes.
 - 1) Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces).

2.3 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.
- B. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails unless otherwise indicated.

2.4 STEEL AND IRON

- A. Tubing: ASTM A 513.
- B. Pipe: ASTM A 53/A 53M, Type F or Type S, Grade A, Standard Weight (Schedule 40), unless another grade and weight are required by structural loads.
 - 1) Provide galvanized finish for exterior installations and where indicated.
- C. Plates, Shapes, and Bars: ASTM A 36/A 36M.

2.5 FASTENERS

- A. General: Provide the following:
 - 1) Hot-Dip Galvanized Railings: Type 304 stainless-steel or hot-dip zinc-coated steel fasteners complying with ASTM A 153/A 153M or ASTM F 2329 for zinc coating.
 - 2) Provide exposed fasteners with finish matching appearance, including color and texture, of railings.
- B. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- C. Fasteners for Interconnecting Railing Components:
 - 1) Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless otherwise indicated.
 - 2) Provide concealed fasteners for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated.
 - 3) Provide tamper-resistant flat-head machine screws for exposed fasteners unless otherwise indicated.

2.6 MISCELLANEOUS MATERIALS

- A. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- B. Etching Cleaner for Galvanized Metal: Complying with MPI#25.
- C. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.
- D. Shop Primers: Provide primers that comply with Section 09 91 00 Paints and Stains.
- E. 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.
- F. Epoxy Zinc-Rich Primer: Complying with MPI#20 and compatible with topcoat.
- G. Shop Primer for Galvanized Steel: Primer formulated for exterior use over zinc-coated metal and compatible with finish paint systems indicated.

- H. Intermediate Coats and Topcoats: Provide products that comply with section 09 91 00 Paints and Stains.
- I. Epoxy Intermediate Coat: Complying with MPI #77 and compatible with primer and topcoat.
- J. Polyurethane Topcoat: Complying with MPI #72 and compatible with undercoat.
- K. Bituminous Paint: Cold-applied asphaltemulsion complying with ASTM D 1187/D 1187M.
- L. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107/C 1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.
- M. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
 - 1) Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

2.7 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Shop assemble railings to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. 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.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that are exposed to weather in a manner that excludes water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with welded connections unless otherwise indicated.

- H. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
 - 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 flux immediately.
 - 4) At exposed connections, finish exposed surfaces smooth and blended so no roughness shows after finishing and welded surface matches contours of adjoining surfaces.
- I. Welded Connections for Aluminum Pipe: Fabricate railings to interconnect members with concealed internal welds that eliminate surface grinding, using manufacturer's standard system of sleeve and socket fittings.
- J. Nonwelded Connections: Connect members with concealed mechanical fasteners and fittings. Fabricate members and fittings to produce flush, smooth, rigid, hairline joints.
 - 1) Fabricate splice joints for field connection using an epoxy structural adhesive if this is manufacturer's standard splicing method.
- K. Form Changes in Direction as Follows:
 - 1) As detailed.
 - 2) By radius bends of radius indicated.
- L. For changes in direction made by bending, use jigs to produce uniform curvature for each repetitive configuration required. Maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- M. Close exposed ends of railing members with prefabricated end fittings.
- N. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work unless otherwise indicated.
- O. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

2.8 STEEL AND IRON FINISHES

- A. Galvanized Railings:

- 1) Hot-dip galvanize exterior steel railings, including hardware, after fabrication.
 - 2) Comply with ASTM A 123/A 123M for hot-dip galvanized railings.
 - 3) Comply with ASTM A 153/A 153M for hot-dip galvanized hardware.
 - 4) Do not quench or apply post galvanizing treatments that might interfere with paint adhesion.
 - 5) Fill vent and drain holes that are exposed in the finished Work, unless indicated to remain as weep holes, by plugging with zinc solder and filing off smooth.
- B. For galvanized railings, provide hot-dip galvanized fittings, brackets, fasteners, sleeves, and other ferrous components.
- C. Preparing Galvanized Railings for Shop Priming: After galvanizing, thoroughly clean railings of grease, dirt, oil, flux, and other foreign matter, and treat with etching cleaner.
- D. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves; however, galvanize anchors to be embedded in exterior concrete or masonry.
- E. Preparation for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with requirements indicated below:
- 1) Exterior Railings: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
 - 2) Railings Indicated to Receive Zinc-Rich Primer: SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning."
- F. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.
- 1) Shop prime uncoated railings with primers specified in Section 09 91 00 paints and Stains unless zinc-rich primer is indicated.
 - 2) Do not apply primer to galvanized surfaces.
- G. Shop-Painted Finish
- 1) Color: Selected from manufacturer's standard colors.
- H. High-Performance Coating: Apply epoxy intermediate and polyurethane topcoats to prime-coated surfaces. Comply with coating manufacturer's written instructions and with requirements in SSPC-PA 1, "Shop, Field, and Maintenance Painting of

Steel," for shop painting. Apply at spreading rates recommended by coating manufacturer.

- 1) Color: Selected from manufacturer's standard colors.

3. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements are clearly marked for Installer. Locate reinforcements and mark locations if not already done.

3.2 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
 - 1) Do not weld, cut, or abrade surfaces of railing components that are coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
 - 2) Set posts plumb within a tolerance of 1/16 inch in 3 feet.
 - 3) Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.
 - 1) Coat, with a heavy coat of bituminous paint, concealed surfaces of aluminum that are in contact with grout, concrete, masonry, wood, or dissimilar metals.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3.3 RAILING CONNECTIONS

- A. Nonwelded Connections: Use mechanical or adhesive joints for permanently connecting railing components. Seal recessed holes of exposed locking screws using plastic cement filler colored to match finish of railings.

- B. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.
- C. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to one side, and locate joint within 6 inches of post.

3.4 ANCHORING POSTS

- A. Use metal sleeves preset and anchored into concrete for installing posts. After posts are inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- B. Form or core-drill holes not less than 5 inches deep and 3/4 inch larger than OD of post for installing posts in concrete. Clean holes of loose material, insert posts, and fill annular space between post and concrete with nonshrink, nonmetallic grout, mixed and placed to comply with anchoring material manufacturer's written instructions.
- C. Cover anchorage joint with flange of same metal as post, welded to post after placing anchoring material.
- D. Anchor posts to metal surfaces with oval flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
 - 1) For steel pipe railings, weld flanges to post and bolt to metal supporting surfaces.
- E. Install removable railing sections, where indicated, in slip-fit metal sockets cast in concrete.

3.5 ADJUSTING AND CLEANING

- A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 requirements for touching up shop-painted surfaces.
 - 1) Apply by brush or spray to provide a minimum 2.0-mil dry film thickness.
- B. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Section 09 91 00 paints and stains.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas, and repair galvanizing to comply with ASTM A 780/A 780M.

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3.6 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED WORK

- A. Finish Carpentry - Section 062000
- B. Door Hardware - Section 087100
- C. Painting - Section 099100

1.2 GRADING REQUIREMENTS

- A. Moisture Content - Not to exceed 19 percent for lumber and kiln dried unless authorized otherwise in writing by the Owner.
- B. Grade and Trade Mark - Required on each piece of lumber (or bundle, in bundled stock); recognized official marks of association under whose rules grades. Grade and trade marks not required if each shipment is accompanied by a Certificate of Inspection by Association.
- C. Quality - Lumber must be sound, thoroughly seasoned, well manufactured, and free from warp that cannot be corrected in process of bridging or nailing. Dress lumber 4 sides unless specified otherwise.

1.3 TEMPORARY ENCLOSURE

- A. Provide temporary wood doors and cloth, or transparent plastic covered wood window frames for exterior wall openings during drywall installation and until the building has dried out. Openings may be glazed instead of fitted with temporary closures if glass and frames are protected.
- B. Provide temporary enclosures and wood doors as required to secure the building during construction.

1.4 STORAGE AND PROTECTION

- A. Stack lumber to ensure proper ventilation and drainage, protect lumber from the elements. Protect against dampness during and after delivery. Store under cover in a well-ventilated building and where not exposed to extreme change of temperature or humidity.

PART 2 - PRODUCTS

1.5 GRADE AND SPECIES OF WOOD

- A. Western Spruce-Pine-Fir or Southern Pine, conforming to applicable requirements of American Softwood Lumber Standards PS-20-70. Other species used only with Architect's written approval.
- B. The grades and/or allowable stress are shown on drawings with the minimum grades allowed as follows:

a)	<u>Category</u>	<u>Grade</u>
b)	Light Framing	Construction
c)	Appearance Framing	Appearance
d)	Structural Light Framing	No. 2
e)	Structural Joists & Planks	No. 2
f)	Studs	Stud

1.6 WOOD GROUNDS AND BLOCKING

- A. Provide Wood grounds and blocking of size and shape required for securing wood trim, curtain tracks and where required to secure other work or equipment in place. Set grounds true to line, level plumb and secured in place. Wood blocking or nailers on steel framing shall be bolted in place.

1.7 PRESERVATIVES

- A. Wood sills, plates in contact with masonry or concrete; furring strips on masonry or concrete; cant strips, nailers and blocking in contact with masonry or concrete and in connection with built-up roofing; and exterior framing shall be pressure treated in accordance with the current AWPB Standard LP-2. All milling parallel to the grain shall be done prior to pressure treating.
- B. Treat filed cuts and holes with two heavy brush coats of the same preservative.
- C. Certification - Each piece of pressure treated wood shall bear the AWPB Quality Mark.

1.8 CONCEALED PLYWOOD

- A. Interior plywood concealed from view, A.P.A. CF-G2-WT.

1.9 GLULAM

- A. All glulam beams shall be constructed according to the America institute of timer construction.
- B. For sizes and specifications of Glulam beams see the structural drawings.

1.10 Laminated Veneer Lumber

- A. All LVL beams shall be constructed according to the America institute of timer construction.

- B. For sizes and specifications of LVL beams see the structural drawings.

1.11 FASTENERS

- A. General: Provide fasteners of size and type indicated, that comply with requirements specified.
 - 1) Where rough carpentry work is exposed to weather, in ground contact, or in areas of high relative humidity, provide fasteners with hot-dip, zinc-coating per ASTM A153.
- B. Nails, Wire, Brads, and Staples: ASTM F1667
- C. Wood Screws: ASME B18.6.1
- D. Lag Bolts: ASME B18.2.1
- E. Bolts: Steel bolts complying with ASTM A307, Grade A with ASTM A563 hex nuts and, where indicated, flat washers.

1.12 METAL FRAMING ANCHORS

- A. General: Provide galvanized steel framing anchors of structural capacity, type, and size indicated, with allowable design loads as published by manufacturer that meet or exceed those indicated.
- B. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A653, G60 coating designation, structural, commercial, or lock-forming quality, as standard with manufacturer for type of anchor indicated.

2. PART 3 - EXECUTION

2.1 INSTALLATION, GENERAL

- A. Discard units of material with defects that impair quality of rough carpentry and that are too small to use with minimum number of joints or optimum joint arrangement.
- B. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted.
- C. Fit rough carpentry to other construction; scribe and cope as required for accurate fit. Correlate location of furring, nailers, blocking, grounds, and similar supports to allow attachment of other construction.
- D. Apply field treatment complying with AWP A M4 to cut surfaces of preservative-treated lumber and plywood.

- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with IBC Table 2304.9.1, Fastening Schedule.

2.2 WOOD GROUNDS, NAILERS, BLOCKING, AND SLEEPERS

- A. Install wood grounds, nailers, blocking, and sleepers where shown, and where required for screeding or attaching other work. Form to shapes shown and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated. Build into masonry during installation of masonry work. Where possible, anchor to formwork before concrete placement.
- C. Install permanent grounds of dressed, preservative-treated, key-beveled lumber not less than 1-1/2 inches wide, and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

2.3 WOOD FURRING

- A. Install plumb and level with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Firestop furred spaces of walls at each floor level, and at ceiling with wood blocking or noncombustible materials, accurately fitted to close furred spaces.

2.4 ROUGH HARDWARE

- A. Provide and install all rough hardware and metal fastenings as shown on drawings, specified herein, or required, for proper installation of carpentry and millwork.
- B. Nails, spikes, screws, bolts and similar items shall be of sizes and types to rigidly secure members in place.
- C. Fasteners, notwithstanding these specifications, shall be in accordance with the Recommended Nailing Schedule, designated as Appendix "A" of the Ohio Building Code.

2.5 FRAMING

- A. Cut wood framing square on bearing, closely fitted, accurately set to required lines and levels and rigidly secure in place. Do not use shims for leveling on bearings.

◆ END OF SECTION ◆

1. 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) Roof sheathing, wall sheathing, floor sheathing and misc. items.
- B. Related Requirements:
 - 1) Section 06 10 00 – Rough Carpentry for plywood backing panels

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details
 - 1) Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
 - 2) For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to project site.
 - 3) Include copies of warranties from chemical treatment manufacturers for each type of treatment.

1.4 INFORMATIONAL SUBMITTALS

- A. Evaluation Reports: For following products, from ICC-ES:
 - 1) Preservative-treated plywood

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Stack panels flat with spacers beneath and between each bundle to provide air circulation. Protect sheathing from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

2. PART 2 – PRODUCTS

2.1 WALL SHEATHING

- A. All structural exterior sheathing on the project is to be 5/8" Exterior Grade APA-Rated Plywood sheathing or OSB as identified within structural drawings and details. Or as shown on structural drawings.
- B. All sheathing behind manufactured stone cement board, water durable, board; surfaced with fiberglass reinforcing mesh on front and back; long edges wrapped; and complying with ANSI A118.9 and ASTM C 1325. Coordinate with specification section 04 73 13 Manufactured Stone.

2.2 ROOF SHEATHING

- A. Plywood Roof Sheathing: Exterior, APA-Rated, Structural 1 sheathing.
 - 1) Span Rating: Not less than 16/0
 - 2) Nominal Thickness: 3/4" or as shown on structural drawings.

2.3 FLOOR SHEATHING

- A. Plywood Floor Sheathing: Exterior, APA-Rated, Structural 1 sheathing.
 - 1) Span Rating: Not less than 16/0
 - 2) Nominal Thickness: 3/4" or as shown on structural drawings.

2.4 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1) For roof and wall sheathing, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667
- C. Power-driven Fasteners: NES NER-272
- D. Wood Screws: ASME B18.6.1.

2.5 MISCELLANEOUS MATERIALS

- A. Adhesives for field gluing panels to framing: Formulation complying with APA AFG-01 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

3. PART 3 – EXECUTION

3.1 INSTALLATION, GENERAL

- A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement. Arrange joints so that pieces do not span between fewer than three support members.
- B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction unless otherwise indicated.
- C. Securely attach to substrate by fastening as indicated, complying with the following:
 - 1) NES NER-272 for power-driven fasteners.
 - 2) Table 2304.9.1, "Fastening Schedule," in ICC's "International Building Code."
- D. Use common wire nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.
- E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.
- F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.
- G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED WORK

- A. Rough Carpentry - Section 06 10 00
- B. Finish Hardware – Section 08 71 00
- C. Casework – Section 12 30 00

1.2 QUALITY ASSURANCE

- A. Quality Standards: Except as otherwise shown or specified, comply with specified provisions of the Architectural Woodwork Institute (AWI) "Quality Standards."
 - 1) Custom grade.
- B. Optimum Moisture Content: Kiln-dry woodwork to an average moisture content within the following ranges or as otherwise recommended by applicable Quality Standards for the regional climatic conditions involved.
 - 1) Exterior woodwork - 9 to 12 percent.
 - 2) Interior woodwork - 7 percent.

1.3 STORAGE AND PROTECTION

- 1) Stack lumber and plywood to proper ventilation. Protection lumber and plywood from the elements. Protect millwork against dampness during and after delivery. Store under cover in a well-ventilated building and where not exposed to extreme change in temperature or humidity. Do not store or install millwork in any part of building until Interior woodwork - 7 percent.

1.4 SUBMITTALS

- A. Provide shop drawings of all factory-built casework.

2. PART 2 - PRODUCTS

2.1 GENERAL

- A. Pressure treatment shall use one of the following approved systems products (CCA pressure treatment is prohibited):
 - 1) Chemical Specialties "ACQ Preserve"
 - 2) Arch Treatment Technologies "Wolmanized Natural Select Wood"

3) Osmose Wood Preserving "NatureWood"

- B. Field-applied adhesives used within the building interior shall have a VOC (volatile organic compound) content not to exceed 30 g/l for wood substrates.

2.2 INTERIOR MATERIALS

- A. General: Provide materials that comply with requirements of the AWI Woodworking Standard for each type of woodwork and quality grade indicated and, where the following products are part of woodwork, with requirements of the referenced product standards, that apply to product characteristics indicated:

- 1) Hardboard: ANSI/AHA A135.4
- 2) High Pressure Laminate: NEMA LD3.
- 3) Medium Density Fiberboard: ANSI A208.2, made with binder containing no urea-formaldehyde resin.
- 4) Particleboard: ANSI A208.1, Grade M-2 made with binder containing no urea-formaldehyde resin.
- 5) Softwood Plywood: PS 1.
- 6) Hardwood Plywood and Face Veneers: HPVA HP-1 made with binder containing no urea-formaldehyde resin.
- 7) Formaldehyde Emission Levels: Comply with formaldehyde emission requirements of each voluntary standard referenced below:
 - a) Particleboard: NPA 8.
 - b) Medium Density Fiberboard: NPA 9.
 - c) Hardwood Plywood: HPMA FE.

- B. Standing and running trim and rails for transparent finish shall be custom grade Red Oak to match existing plain sawn, conforming to AWI Section 300.

- 1) Backout or groove backs of flat trim members and kerf backs of other wide flat members, except for members with ends exposed in finished work.

2.3 FACTORY FINISHING OF INTERIOR WOODWORK

- A. Quality standard comply with AWI Section 1500.
- B. General: The prefinishing of interior architectural woodwork is required to be preformed at factory as specified in this section where practical.
- C. Preparations for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces and similar preparations for finishing of architectural woodwork, as applicable to each unit of work.

- D. Transparent Finish: Comply with requirements indicated below for grade, finish system, staining, effect, and sheen, with sheen measured on 60 degree gloss meter per ASTM D523.

- 1) Grade: Custom
- 2) AWI Finish System TR-6 - Catalyzed Polyurethane
- 3) Staining: Match approved sample for color
- 4) Effect: Open grain
- 5) Sheen: Semi gloss bright rubbed effect 55 - 60 degree.
- 6) Match existing stain in color and appearance.

2.4 MISCELLANEOUS BLOCKING AND FRAMING

- A. Light Framing material in Specification Section 06 10 00.

2.5 PLASTIC LAMINATE

- A. Formica, Wilsonart or Pionite (pattern selected by Architect).
- B. Substrate for plastic laminate Particle Board Grade 1-M-2, ANSI A161.1. Substrate for plastic laminate for cabinets and counter tops with sinks built in or in other high moisture area. Particle Board Grade 2-M-2 (made with phenol-formaldehyde resins or equivalent); ANSI A208.1 or at contractors option plywood grade A.P.A. BB EXT. (Medium Density Overlay) 3/4" thick.
- C. Low pressure laminate shall be equal to Herculux as supplied by Sauder Woodworking Co. Archbold, Ohio, Pionite – cabinet liner laminate or Wilsonart – cabinet liner sheet.

2.6 EXTERIOR TRIMWORK

- A. All exterior wood trim, column wraps, and faux beams and columns to be premium grade rough sawn cedar.
- B. All exterior wood trim is to be stained and sealed.
- C. All joints and miters are to be mechanically joined with biscuits and pocket screws at a minimum of 12" on center and as required to prevent future separation of joints and miters.
- D. Provide relief cuts on back side of all trim as required to prevent cupping. At locations such as but not limited to column wraps, where there is room behind the wood trim, provide additional bracing to keep from cupping.
- E. All fasteners should be installed to be concealed whenever possible. when face fastening is inevitable, conceal fasteners with plugs to match adjacent wood. Fasteners to be 4" minimum exterior grade trim screws.
- F. All fasteners for cedar trim to be stainless steel.

- G. The intent is for the trim to appear as structural beams, columns and trusses, therefore there is to be no seams in the members.
- H. See drawings for individual sizes of trim.
- I. Provide wood blocking as required for proper installation of wood trim.

2.7 EXTERIOR WOOD SOFFITS

- A. Wood soffits to be premium grade 1x6 tongue and groove cedar boards.
- B. At locations where the structure is running the opposite way than the cedar boards are to be installed, blocking will need to be installed at 16" on center for installation of the cedar boards.
- C. Provide blocking as required for installation of wood soffit.
- D. All exterior wood soffit is to be stained and sealed.
- E. All fasteners for cedar soffit to be stainless steel and blind nailed to be concealed from view.

3. PART 3 - EXECUTION

3.1 WORK AND TRIM

- A. Millwork and trim conform to design and details shown. Where practicable, work shall be finished and assembled at mill. All millwork and trim shall be finished smooth and free from machine or tool marks that will show through the finish. All nailheads shall be set to receive putty.
- B. Joints tight and formed to conceal shrinkage.
- C. Shop miter 4 inches or more from heel to point glued and locked. Make dowels and tenons to a driving fit. Make outside joints to exclude water and set in waterproof glue. Shop joints of interior work with waterproof glue or hot glue under pressure.
- D. Trim single lengths without splicing. Running finish shall long lengths and jointed only where rigid fastenings can be made. Miter exterior and cope interior corners.
- E. Counter tops requiring plastic laminate shall include surface, exposed edges and backsplashes where indicated on drawings. Apply two applications of recommended adhesive to both laminate and surface to be adhered to. Allow each application to dry to the touch before adhering laminate to surface.

3.2 CABINET WORK - GENERAL

- A. See Section 12 30 00

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◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 DESCRIPTION

- A. Solid surface and plastic fabrications for window stools, counter tops and as shown on drawings and specified herein.

1.2 RELATED SECTIONS

- A. Related work specified elsewhere: Finish Carpentry Section 06 20 00

1.3 SUBMITTALS

A. SHOP DRAWINGS

- 1) Indicate dimensions, component sizes, fabrication details, attachment provisions and coordination requirements with adjacent work.

B. SAMPLES

- 1) Submit minimum 6" x 6" (156 mm x 156 mm) samples. Indicate full range of color and pattern variation. Approved samples will be retained as a standard for work.

C. MAINTENANCE DATA

- 1) Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project closeout documents.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver no components to project site until areas are ready for installation. Store indoors.
- B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.5 QUALITY CRITERIA

- A. **APPLICABLE STANDARDS:** Standards of the following, as referenced herein:

- 1) American National Standards Institute (ANSI).
- 2) American Society for Testing and Materials (ASTM).
- 3) National Electrical Manufacturers Association (NEMA).

B. ALLOWABLE TOLERANCES

- 1) Variation in component size: $\pm 1/8"$ (3mm).
- 2) Location of openings: $\pm 1/8"$ (3mm) from indicated location.

1.6 WARRANTY

- A. Provide manufacturer's warranty. The manufacturer warrants to the original purchaser that they shall, at their option, repair or replace, without charge, such product if it fails due to a manufacturing defect during the first 10 years after initial installation. This includes reasonable labor charges needed to repair or replace the product covered hereunder.

2. PART 2 - PRODUCTS

2.1 SOLID POLYMER FABRICATIONS

A. BASIS OF DESIGN

- 1) Corian Solid Surface, Price Group D

B. ACCEPTABLE PRODUCT

- 1) Wilsonart Solid Surface
- 2) Formica "Surell" Solid Surface
- 3) Hi-Macs Solid Surface

- C. MATERIAL: Cast filled acrylic; not coated, laminated or of composite construction, meeting ANSI Z124-1980, Type Six, and Fed. Spec. WW-P-541E/GEN dated August 1, 1980.

- 1) Material shall have minimum physical and performance properties specified.
- 2) Superficial damage to a depth of 0.10" (2.5 mm) shall be repairable by sanding or polishing.

D. PERFORMANCE CHARACTERISTICS:

- 1) Tensile Strength: ASTM D638-84, 600psi
- 2) Tensile Modulus: ASTM D638-84, 1.5×10^6 psi
- 3) Elongation: ASTM D638-84, 0.4% min.
- 4) Hardness: Rockwell "M" Scale, 94
- 5) Gloss (60-degree Gardner): ANSI Z124-1980/HUD Bulletin/UM-73-84, 5-20

- 6) Color Stability: NEMA LD3, No Change 200 Hours
- 7) Wear and Clean: ANSI Z124-1980/HUD Bulletin, Passes
- 8) Water Absorption Weight (% Max.): ASTM D570-81, 24 Hours Long Term
 - a) 0.04 – 0.4 (3/4")
 - b) 0.09 – 0.80 (1/4")
- 9) Izod Impact: ASTM D256-84 (Method A), 0.28ft. – lbs/in of notch
- 10) Impact Resistance Sheets: NEMA LD3, No Fracture
 - a) ½ lb ball – ¼" slab – 36" drop
 - b) 1 lb ball – ½" slab – 36" drop
 - c) 2 lb ball – ¾" slab – 36" drop
- 11) Impact Resistance Bowls: ANSI Z124-1980/HUD Bulletin/UM-73-84, No crack or chips
- 12) Thermal Expansion: ASTM D696-79, 3.02×10^{-5}
- 13) Boiling Water Surface Resistance: NEMA LD3, No visible change
- 14) High Temperature Resistance (500-degrees): NEMA LD3, No change
- 15) Stain Resistance: ANSI Z124-1980/HUD Bulletin/UM-73-84, Passes
- 16) Weatherability: ASTM D1499-84, No change 1000 hours
- 17) Specific Gravity: ASTM D570-81, 1.8 standard colors
- 18) Flammability: ASTM E-84-84a
 - a) Flame Spread, Passes
 - b) Smoke Developed, Passes
 - c) Class I

2.2 COUNTERTOPS

- A. Provide countertops in Camp Store 101 and Registration 104 as shown on drawings.

2.3 WINDOW SILLS

- A. ½" (13mm) thick, Solid Polymer Surfacing, adhesively joined with no exposed seams, having edge details as indicated on the architect's drawings.

2.4 LOW WALL CAPS

- A. Provide caps on low walls in Camp Store 101 and Registration 104 as shown on drawings.

2.5 JOINT ADHESIVE

- A. Manufacturer's standard two-part adhesive kit to create inconspicuous, non-porous joints.

3. PART 3 - EXECUTION

3.1 FABRICATION

- A. Factory fabricate components to greatest extent practicable to sizes and shapes indicated, in accordance with approved shop drawings.
- B. Form joints between components using manufacturer's standard joint adhesive, without conspicuous joints.
- C. Cut and finish component edges with clean, sharp returns and round all exposed edges and corners. Route radii and contours to template. Repair or reject defective and inaccurate work.
- D. A certified fabricator shall be used for fabrication and/or installation, to ensure compliance with the warranty and assure a quality installation.

3.2 INSTALLATION

- A. Install components plumb and level, scribed to adjacent finishes, in accordance with approved shop drawings and product installation data.
- B. Form field joints using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.
- C. Keep components and hands clean during installation. Remove adhesives, sealants and other stains. Keep clean until Date of Substantial Completion. Replace stained components.
- D. Protect surfaces from damage until Date of Substantial Completion. Replace damaged work that cannot be repaired to architect's satisfaction.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Organic and inorganic insulation applied for thermal protection in walls and ceilings; under concrete slabs on grade; and at perimeter of foundations.
- B. Vapor retarders.

1.2 SUMMARY

- A. Provide glass fiber and rigid insulation, as indicated on the drawings and in this specification in the locations shown and described.

1.3 SUBMITTALS

- A. Product Data: Submit product literature and installation instructions for specified insulation.
- B. Submit manufacturers literature on products to be used giving data such as fire rating, R or K value density, burning characteristics etc.

1.4 DELIVERY, STORAGE AND PROTECTION

- A. Protect insulation from physical damage and from becoming wet, soiled, or covered with ice or snow before, during and after installation. Comply with manufacturer's recommendations for handling, storage and protection during installation.
- B. Label insulation packages to include material name, production date and/or product code.

1.5 MANUFACTURER

- A. Owens-Corning Fiberglass Corporation, Certainteed, Dow or Manville or approved equal.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Owens Corning "Foamular 250" Extruded Polystyrene Board Insulation: Rigid, cellular polystyrene thermal insulation formed from polystyrene base resin by an extrusion process using hydrochlorofluorocarbons as blowing agents to comply with ASTM C578 Type IV, minimum density of 1.6 lb/cu ft and with other requirements indicated below:

- 1) Provide foundation perimeter insulation and floor insulation positioned as shown on drawings.
 - a) Material: Rigid extruded polystyrene insulation with a U factor of .20 at Mean Temperature of 75° F. The R value shall be based on an "Equilibrium" or design value. The 2" insulation shall have an R of 10. Foundation insulation shall extend down a distance of 24 inches minimum below finish grade or as shown on drawings.
- B. Unfaced Mineral Fiber Blanket Insulation: Thermal insulation combining mineral fibers of type described herein with thermosetting resins to comply with ASTM C665, Type I (blankets without membrane facing)
 - 1) Application. Between studs in exterior walls and in the ceiling system to form a continuous thermal barrier as required and as shown on drawings.
 - 2) Mineral Fiber Type: Fibers manufactured from glass.
 - 3) Surface Burning Characteristics: Maximum flame spread and smoke developed values of 25 and 50.
 - 4) Thickness as shown on drawings.
- C. Unfaced Sound Attenuation Batt Insulation: Insulation combining mineral fibers of type described below with thermosetting resins to comply with ASTM C665, Type 1 (blankets without membrane facing).
 - 1) Mineral Fiber Type: Fibers manufactured from glass.
 - 2) Application: interior stud walls between rooms, above drop ceilings where shown on reflected ceiling plan, on top of all acoustic suspended ceiling clouds, and as shown on drawings. (2 pcf density).
 - 3) Thickness as shown on drawings.

2.2 FOAM INSULATION SEALANT

- A. Polyurethane Foam Sealant
- B. Foam insulation sealant shall meet ASTM E-84 for flamespread and smoke density. Any desired substitution for this product shall be submitted to the Architect with published supporting specifications data.
- C. Foam seal around the perimeter of all exterior windows and door frames.
- D. Run ½" foam insulation sealant bead in the center edge of all horizontal and vertical joints of rigid wall insulation. Seal gaps between rigid insulation, brick and block at louver penetrations where foam sealant is capable of sealing gap.
- E. All penetrations of exterior walls (louvers, etc.) shall have all voids foam sealed.

- F. Prepare surface and install per manufacturer's recommendations.
- G. Material shall have the following properties:
 - 1) Material Polyurethane
 - 2) Flame Spread 20
 - 3) Smoke 15
 - 4) Conductivity @ 75 degrees F $K=0.219$ BTU in/hr.
- H. Installer shall be a factory-certified contractor. Installation shall be in strict conformance with the manufacturer's printed instructions.

2.3 OTHER MATERIALS

- A. Vapor barriers as shown on drawings.
- B. Provide materials, not specifically described but required for a complete and proper installation of the work in this section.

3. PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

- A. Examine the areas and conditions under which work of this section will be installed. Verify that adjacent materials are dry and ready to receive insulation. Verify mechanical and electrical services within walls have been tested.
- B. Provide written report listing conditions detrimental to performance of work in this section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION - GENERAL

- A. Comply with manufacturer's instruction for particular conditions of installation in each case.
- B. Perimeter insulation shall be bonded to face of foundation walls using bonding method as recommended by manufacturer.
- C. Install rigid wall insulation with tightly sealed joints to form a continuous insulation barrier.
- D. Provide insulation support straps to secure insulation in place wherever stud walls do not have sheathing on one side or both sides, and anywhere else they are needed to keep the integrity of the thermal barrier in place.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Weather barrier membrane, seam tape, flashing, fasteners, etc. to create a continuous barrier against air and moisture infiltration on exterior walls. Typical all locations except behind stone veneer system.
- B. For weather barrier behind stone veneer system see specification 04 73 13 Manufactured Stone.

1.2 REFERENCES

- A. ASTM International
 - 1) ASTM C920; Standard Specification for Elastomeric Joint Sealants
 - 2) ASTM C1193; Standard Guide for Use of Joint Sealants
 - 3) ASTM D882; Test Method for Tensile Properties of Thin Plastic Sheeting
 - 4) ASTM D1117; Standard Guide for Evaluating Non-woven Fabrics
 - 5) ASTM E84; Test Method for Surface Burning Characteristics of Building Materials
 - 6) ASTM E96; Test Method for Water Vapor Transmission of Materials
 - 7) ASTM E1677; Specification for Air Retarder Material or System for Framed Building Walls
 - 8) ASTM E2178; Test Method for Air Permeance of Building Materials
 - 9) ASTM E2357; Standard Test Method for Determining Air Leakage of Air Barrier Assemblies
- B. AATCC – American Association of Textile Chemists and Colorists
 - 1) Test Method 127 Water Resistance: Hydrostatic Pressure Test
- C. TAPPI
 - 1) Test Method T-410; Grams of Paper and Paperboard (Weight per Unit Area)
 - 2) Test Method T-460; Air Resistance (Gurley Hill Method)

1.3 QUALITY ASSURANCE

A. Qualifications

- 1) Installer shall have experience with installation of weather barrier assemblies under similar conditions.
- 2) Installation shall be in accordance with weather barrier manufacturer's installation guidelines and recommendations.
- 3) Source Limitations: Provide weather barrier and accessory materials produced by single manufacturer.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver weather barrier materials and components in manufacturer's original, unopened, undamaged containers with identification labels intact.
- B. Store weather barrier materials as recommended by weather barrier manufacturer.

1.5 SCHEDULING

- A. Review requirements for sequencing of installation of weather barrier assembly with installation of windows, doors, louvers and flashings to provide a weather-tight barrier assembly.

2. PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. DuPont; 4417 Lancaster Pike, Chestnut Run Plaza 728, Wilmington, DE 19805; 1-800-44-TYVEK (8-9835); <http://www.construction.tyvek.com>, Mar-Flex Waterproofing & Building Systems, Carlisle, Ohio (800) 498-1411, www.mar-flex.com or approved equal.
- B. DRYline Building Wrap Systems is an approved manufacturer as long as they abide by all specifications and project requirements.

2.2 MATERIALS

- A. Basis of Design: spunbonded polyolefin, non-woven, non-perforated, weather barrier is based upon DuPont™ Tyvek® CommercialWrap® and related assembly components.
 - 1) Air Penetration: 0.001 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2178. Type I per ASTM E1677. ≤0.04 cfm/ft² at 75 Pa, when tested in accordance with ASTM E2357.

- 2) Water Vapor Transmission: 28 perms, when tested in accordance with ASTM E96, Method B.
- 3) Water Penetration Resistance: Minimum 280 cm when tested in accordance with AATCC Test Method 127.
- 4) Basis Weight: Minimum 2.7 oz/yd², when tested in accordance with TAPPI Test Method T-410.
- 5) Air Resistance: Air infiltration at >1500 seconds, when tested in accordance with TAPPI Test Method T-460.
- 6) Tensile Strength: Minimum 38/35 lbs/in., when tested in accordance with ASTM D882, Method A.
- 7) Tear Resistance: 12/10 lbs., when tested in accordance with ASTM D1117.
- 8) Surface Burning Characteristics: Class A, when tested in accordance with ASTM E84. Flame Spread: 10, Smoke Developed: 10.

2.3 ACCESSORIES

- A. Seam Tape: As recommended by the weather barrier manufacturer.
- B. Fasteners: As recommended by the weather barrier manufacturer.
- C. Sealants
 - 1) Products: Sealants recommended by the weather barrier manufacturer.
- D. Adhesives:
 - 1) Provide adhesive recommended by weather barrier manufacturer.
- E. Primers:
 - 1) Provide flashing manufacturer recommended primer to assist in adhesion between substrate and flashing.
- F. Flashing
 - 1) Flexible membrane flashing materials for window openings and penetrations recommended by manufacturer.

3. PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.

3.2 INSTALLATION – WEATHER BARRIER

- A. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations.
- B. Install weather barrier prior to installation of windows and doors.
- C. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
- D. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level.
- E. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- F. Window and Door Openings: Extend weather barrier completely over openings.
- G. Overlap weather barrier
 - 1) Exterior corners: minimum 12 inches.
 - 2) Seams: minimum 6 inches.
- H. Weather Barrier Attachment:
 - 1) Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommend fasteners, space 12-18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.

3.3 SEAMING

- A. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- B. Seal any tears or cuts as recommended by weather barrier manufacturer.

3.4 OPENING PREPARATION (as per manufacturers recommendations)

- A. Flush cut weather barrier at edge of sheathing around full perimeter of opening.
- B. Cut a head flap at 45-degree angle in the weather barrier at window head to

expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

3.5 PROTECTION

- A. Protect installed weather barrier from damage.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

- 1) Granule surfaced asphalt shingle roofing.
- 2) Moisture shedding underlayment, eaves, valley and ridge protection
- 3) Associated metal flashing

1.2 RELATED SECTIONS

- A. Section 06 10 00 – Rough Carpentry: Plywood Roof Sheathing
- B. Section 07 62 00 – Flashing and Sheet Metal

1.3 REFERENCES

- A. ASTM A 653/A 653M – Standard Specification for Steel Sheets, Zinc-Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvannealed) by the Hot-Dip Process
- B. Coated (Galvanized) or Zinc-Iron-Alloy-Coated (Galvannealed) by the Hot-Dip Process
- C. ASTM B 209 – Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
- D. ASTM D 225 – Standard Specification for Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules.
- E. ASTM D 226 – Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.
- F. ASTM D 1970 – Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials used as Steep Roofing Underlayment for Ice Dam Protection.
- G. ASTM D 3018 – Standard Specification for Class A Shingles Surfaced with Mineral Granules.
- H. ASTM D 3161 – Standard Test Method for Wind Resistance of Asphalt Shingles (Fan-Induced Method).
- I. ASTM D 3462 – Standard Specification for Asphalt Shingles Made from Glass Felt and Surfaced with Mineral Granules.
- J. ASTM D 4586 – Standard Specification for Asphalt Roof Cement, Asbestos-Free.
- K. ASTM D-4869 – Standard Specification for Asphalt-Saturated Organic Felt

Shingle Underlayment Used in Roofing.

- L. ASTM D 6757 – Standard Specification for Inorganic Underlayment for use with Steep Slope Roofing Products.
- M. ASTM E 108 – Standard Test Methods for Fire Test of Roof Coverings
- N. ASTM G 21 – Determining Resistance of Synthetic Polymers to Fungi

1.4 SUBMITTALS

- A. Product Data: Provide manufacturer's printed product information indicating material characteristics, performance criteria and product limitations.
- B. Manufacturer's Installation Instructions: Provide published instructions that indicate preparation required and installation procedures.
- C. Certificate of Compliance: Provide Certificate of Compliance from an independent laboratory indicating that the asphalt fiberglass shingles made in normal production meet or exceed the requirements of the following:
 - 1) ASTM E 108/UL 790 Class A Fire Resistance
 - 2) ASTM D 3161/UL 997 Wind Resistance.
 - 3) ASTM D 3462
- D. Shop Drawings: Indicate specially configured metal flashing, jointing methods and locations, fastening methods and locations and installation details as required by project conditions indicated.

1.5 QUALITY ASSURANCE

- A. Installer Minimum Qualifications: Installer shall be licensed or otherwise authorized by all federal, state and local authorities to install all products specified in this section. Installer shall perform work in accordance with NRCA Roofing and Waterproofing Manual Work shall be acceptable to the synthetic slate roof tile manufacturer.
- B. Pre-Installation Meeting – Conduct a pre-installation meeting at the site prior to commencing work of this section: Require attendance of entities directly concerned with roof installation. Agenda will include:
 - 1) Installation procedures and manufacturer's recommendations
 - 2) Safety procedures
 - 3) Coordination with installation of other work
 - 4) Availability of roofing materials.
 - 5) Preparation and approval of substrate and penetrations through roof.
 - 6) Other items related to successful execution of work
- C. Maintain one copy of manufacturers application instructions on the project site.

- D. Verify that manufacturer's label contains references to specified ASTM standards

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store Products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials and materials used with solvent based materials, in accordance with requirements of local authorities having jurisdiction.
- C. Deliver shingles to site in manufacturer's unopened labeled bundles. Promptly verify quantities and conditions. Immediately remove damaged products from site.

1.7 PROJECT CONDITIONS

- A. Anticipate and observe environmental conditions (temperature, humidity and moisture) within limits recommended by manufacturer for optimum results. Do not install products under environment conditions outside manufacturer's absolute limits.
- B. Provide 50 square feet of extra shingles
- C. Take special care when applying underlayment and shingles when ambient or wind chill temperature is below 45 degrees F. Tack underlayment in place if it does not adhere immediately to the deck.

1.8 WARRANTY

- A. Manufacturer's Warranty: Furnish shingle manufacturer's warranty for the product listed below:
 - 1) Lifetime Limited Warranty
- B. Warranty Supplement: Provide manufacturer's supplemental warranty to cover labor and materials in the event of a material defect for the following period after completion of application of shingles:
 - 1) First Ten Years (All Lifetime Warranty products)
- C. Extended Warranty Protection (can only be provided by a CertainTeed Credentialed Contractor): Provide NON-PRO-RATED protections as follows:
 - 1) 20 years material and labor costs for repair or replacement.
- D. Warranty Transferability Clause: Make available to Owner shingle manufacturer's standard option for transferring warranty to a new owner.
- E. Wind Warranty of 110 mph with grade to 130 mph for first 15 years provided all manufacturers' conditions and instructions are met by contractor.

- F. Refer to manufacturer's warranty for adjustments for commercial applications.

2. PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturer: Provide products manufactured by the CertainTeed, Owens Corning or GAF
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 25 00 Substitution Procedures.

2.2 ASPHALT FIBERGLASS SHINGLES

- A. CertainTeed Landmark Pro : Conforming to ASTM D 3018 Type I – Self-Sealing; UL Certification of ASTM D 3462, ASTM D 3161/UL997 80-mph Wind Resistance and UL Class A Fire Resistance; glass fiber mat base; ceramically colored algae resistant granules across entire face of the shingle; two-piece laminated shingle.
- B. Weight: (250 pounds East Coast) (270 pounds West Coast) pounds per square (100 square feet) (14.6 kg/sq m)
- C. Color: As selected by Architect from manufacturer's standards

2.3 SHEET MATERIALS

- A. Eaves Protection: CertainTeed "WinterGuard";ASTM D1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and "split" back plastic release film; provide material warranty equal in duration to that of shingles being applied.
 - 1) CertainTeed WinterGuard Sand, equal by Owens Corning or GAF.
 - 2) CertainTeed WinterGuard HT, equal by Owens Corning or GAF.
 - 3) CertainTeed WinterGuard Granular, equal by Owens Corning or GAF.

2.4 FLASHING MATERIALS

- A. Sheet Flashing: ASTM A 361/A361M; 26 Gauge (0.45 mm) steel with minimum G115/Z350 galvanized coating
- B. All exposed flashing to be prefinished black.
- C. For counterflashing see 07 62 00 Sheet Metal Flashing and Trim

2.5 SOFFIT PANELS

- A. CertainTeed prefinished metal soffit panels, 5/8" thick, wall thickness .040 inch, perforated and unperforated (see drawings). Equals by Owens Corning and GAF.

2.6 ACCESSORIES

- A. Nails: Standard round wire type roofing nails, corrosion resistant; hot dipped zinc coated steel, aluminum or chormated steel; minimum 3.8 inch (9.5mm) head diameter; minimum 11 or 12 gage (2.5mm) shank diameter; shank to be sufficient length to penetrate through the roof sheathing or ¾ inch (19mm) into solid wood, plywood or non-veneer wood decking.
- B. Asphalt Roofing Cement: ASTM D 4586, Type I or II

2.7 FLASHING FABRICATION

- A. Form flashing to profiles indicated on Drawings and to protect roofing materials from physical damage and shed water.
- B. Form sections square and accurate to profile, in maximum possible lengths, free from distortion or defects detrimental to appearance or performance.

2.8 RIDGE VENT

- A. CertainTeed Ridge Vent – 12" Shingle over lay with 18sqin of net free area per linear foot. Or approved equal
- B. Wind Driven Rain Resistance to 100MPH

2.9 INTAKE VENT

- A. CertainTeed Intake Vent – 12" Shingle over lay with 9 sqin of net free area per linear foot. Or approved equal
- B. Wind Driven Rain Resistance to 100MPH

3. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surfaces.
- C. Verify deck surfaces are dry and free of ridges, warps or voids.

3.2 ROOF DECK PREPARATION

- A. Follow shingle manufacturer's recommendations for acceptable roof deck material
- B. Broom clean deck surfaces under eave protection and underlayment prior to their application

3.3 INSTALLATION – PROTECTIVE UNDERLAYMENT

- A. Place eave edge and gable metal edge flashing tight with fascia boards. Weather-lap joints 2 inches (50mm). Secure flange with nails spaced 8 inches (200 mm) on center.
- B. Apply CertainTeed “WinterGuard” Waterproofing Shingle Underlayment in accordance with manufacturer’s instructions over the entire new roof.

3.4 INSTALLATION – VALLEY PROTECTION

- A. .080 Aluminum valley flashing, 3’-0” wide on each side.

3.5 INSTALLATION – METAL FLASHING

- A. Weather-lap joints minimum 2 inches (50 mm).
- B. Seal work projecting through or mounted on roof with asphalt roofing cement and make weather tight.

3.6 INSTALLATION- ASPHALT SHINGLES

- A. Install shingles in accordance with manufacturer’s instructions for product type and application specified.

3.7 FIELD QUALITY CONTROL

- A. Field inspection will be performed.
- B. Visual inspection of the work will be provided by Owner. If conditions are unacceptable, Owner will notify the Architect.

3.8 PROTECTION OF FINISHED WORK

- A. Protect finished work.
- B. Do not permit traffic over finished roof surface.

◆ END OF SECTION ◆

1. PART 1 – GENERAL

1.1 SECTION INCLUDES

- A. Fiber Cement Lap Siding
 - 1) Location: Typical siding on exterior of building
- B. Fiber Cement Textured Siding Panels
 - 1) Location: Exterior Storage 102 and Mechanical yard 112.
- C. Fiber Cement Smooth Siding Panels
 - 1) Behind wood trusses members on exterior of building.
- D. Fiber Cement Trim
 - 1) See drawing for varies locations.

1.2 RELATED WORK

- A. Rough Carpentry - Section 06 10 00
- B. Thermal Insulation – Section 07 21 00
- C. Joint Sealants – Section 07 92 00

1.3 SUMMARY

- A. Provide Fiber Lab Siding, and Fiber Cement Panel Siding as indicated on the drawings and in this specification and in the locations shown and described on the drawings.

1.4 SUBMITTALS

- A. Product Data: Submit product literature, samples and installation instructions for specified insulation.
- B. Submit manufacturers literature on products

1.5 DELIVERY, STORAGE AND PROTECTION

- A. Protect fiber Lab Siding from physical damage. Comply with manufacturer's recommendations for handling, storage and protection during installation.
- B. Label fiber cement lap siding packages to include material name, production date and/or product code.

1.6 MANUFACTURER

- A. JamesHardie, Allura, Nichiha or approved equal.

2. PART 2 – PRODUCTS

2.1 GENERAL

- A. Lap Siding Basis of Design: HL5 Select Cedarmill Fiber Cement siding with ColorPlus material requiring no painting with equals by Allura, and Nichiha.
- B. Panel Siding Basis of Design: Sierra 8, 48" x 120" Fiber Cement panel Siding.
- C. Smooth Panel Siding basis of Design: Smooth, Statement Collection 48"x120" Smooth Cement Panel Siding.

2.2 MATERIALS

- A. Cement Fiber Board:
 - 1) Basis of Design: Select Cedarmill 5/16" thick, 5 1/4" width, 4" exposed siding, 12' planks and weight 2.3lbs/ sq. ft. Fire resistance ASTM-E119.
 - 2) Equals by Allura and Nichiha
- B. Cement Fiber Panel Siding:
 - 1) Basis of Design: 48" x 120" Fiber Cement panel Siding. Primed. To be field painted to match other panels if manufacturer doesn't make prefinished options.
 - 2) Equals by Allura and Nichiha.
- C. Smooth Cement Fiber Panel Siding
 - 1) Smooth, Statement Collection 48"x120" Smooth Cement Panel Siding.
 - 2) Equals by Allura and Nichiha.
- D. Cement Fiber Trim
 - 1) Statement Collection, see drawings for sizes.
 - 2) Equals by Allura and Nichiha.

3. PART 3 - EXECUTION

3.1 STORAGE AND HANDLING

- A. Store flat and keep dry and covered prior to installation.
- B. Installing siding wet or saturated may result in shrinkage at butt joints.

- C. Carry planks on edge.
- D. Protect edges and corners from breakage.

3.2 GENERAL REQUIREMENTS

- A. Fiber cement lap siding can be installed over braced wood or steel studs spaced a maximum of 24" o.c. or directly to minimum 7/16" thick OSB sheathing. Follow manufacturer's fastener requirements. Irregularities in framing and sheathing can mirror through the finished application.
- B. A water-resistive barrier is required in accordance with local building code requirements. The water-resistive barrier must be appropriately installed with penetration and junction flashing in accordance with local building code requirements. Follow manufacturer's recommendations for water-resistive barriers.
- C. When installing fiber cement products all clearance details listed below must be followed:
 - 1) Roof to wall: Min. 2"
 - 2) Horizontal Flashing: Min. ¼" Do not caulk
 - 3) Kickout Flashing
 - 4) As required by IRC code min. 4" x 4"
 - 5) Slabs, Path, Steps to Siding: Min. 2"
 - 6) Deck to Wall: Min. 2"
 - 7) Grounding to Siding: 6"
 - 8) Gutter to Siding: 1"
 - 9) Sheltered Areas: Min. ¼" or Min. ½"
 - 10) Mortar/Masonry: Min. ¼"
 - 11) Drip Edge
 - 12) Block Penetration: Min: ¼" Do not caulk
 - 13) Valley/Shingle Extension: Extend shingles at least 1" out from the fascia when gutters are present
- D. Adjacent finished grade must slope away from the building in accordance with local building codes – typically a minimum of 6" in the first 10'.

- E. Do not use lap siding in Fascia or Trim applications.
- F. Do not install fiber cement products, such that they may remain in contact with standing water.
- G. Lap siding may be installed on flat vertical wall applications only.
- H. DO NOT use stain, oil/alkyd base paint, or powder coating on James Hardie® Products.
- I. For areas where the span of the wall is significant in length, the contractor should take into consideration the coefficient of thermal expansion and moisture movement of the product in their design. These values can be obtained from the manufacturer.

3.3 INSTALLATION

- A. One or more of the following joint treatment options are required by code (as referenced 2009 IRC R703.3.2)
 - 1) Joint Flashing
 - 2) Caulking: caulking is not recommended for ColorPlus for aesthetic reasons as the caulking and ColorPlus will weather differently. For the same reason, do not caulk nail heads on ColorPlus products.

3.4 FASTENER REQUIREMENTS

- A. Blind Nailing is the preferred method of installation for lap siding products. Face nailing should only be used where required by code for high wind areas and must not be used in conjunction with Blind nailing. Pin-backed corners may be done for aesthetic purposes only. Pin-backs shall be done with finish nails only and are not a substitute for blind or face nailing.
 - 1) Blind Nailing
 - a) Nails – Wood Framing
 - [1] Siding nail (0.09" shank x 0.221" HD x 2" long)
 - [2] 11 ga. Roofing nail (0.121" shank x 0.371" HD x 1.25" long)
 - b) OSB Minimum 7/16"
 - [1] 11 ga. Roofing nail (0.121" shank x 0.371 " HD x 1.75" long)
 - [2] Ribbed Wafer-head or equivalent (No. 8 x 1 5/8" long x 0.375" HD)
 - 2) Face Nailing

- a) Nails – Wood Framing
 - [1] 6d (0.113" shank x 0.267" HD x 2" long)
 - [2] Siding nail (0.09" shank x 0.221" HD x 2" long)
- b) OSB minimum 7/16"
 - [1] Siding nail (0.09" shank x 0.221" HD x 1-1/2" long)

B. General Fastening Requirements

- 1) Fasteners must be corrosion resistant, galvanized, or stainless steel. Electro-galvanized are acceptable but may exhibit premature corrosion. James Hardie recommends the use of quality, hot-dipped galvanized nails. James Hardie is not responsible for the corrosion resistance of fasteners. Stainless steel fasteners are recommended when installing James Hardie® products near the ocean, large bodies of water, or in very humid climates.
- 2) Manufacturers of ACQ and CA preservative-treated wood recommend spacer materials or other physical barriers to prevent direct contact of ACQ or CA preservative-treated wood and aluminum products. Fasteners used to attach HardieTrim Tabs to preservative-treated wood shall be of hot dipped zinc-coated galvanized steel or stainless steel and in accordance to 2009 IRC R317.3 or 2009 IBC 2304.9.5.
 - a) Consult applicable product evaluation or listing for correct fasteners type and placement to achieve specified design wind loads.
 - b) NOTE: Published wind loads may not be applicable to all areas where Local Building Codes have specific jurisdiction. Consult James Hardie Technical Services if you are unsure of applicable compliance documentation.
 - c) Drive fasteners perpendicular to siding and framing.
 - d) Fastener heads should fit snug against siding (no air space).
 - e) Do not over-drive nail heads or drive nails at an angle.
 - f) If nail is countersunk, fill nail hole and add a nail.
 - g) For wood framing, under driven nails should be hit flush to the plank with a hammer (for steel framing, remove and replace nail).
 - h) NOTE: Whenever a structural member is present, HardiePlank should be fastened with even spacing to the structural member. The tables allowing direct to OSB or plywood should only be used when traditional framing is not available.

- i) Do not use aluminum fasteners, staples, or slipped head nails.

C. Pneumatic Fastening

- 1) James Hardie products can be hand nailed or fastened with a pneumatic tool. Pneumatic fastening is highly recommended. Set air pressure so that the fastener is driven snug with the surface of the siding. A flush mount attachment on the pneumatic tool is recommended. This will help control the depth the nail is driven. If setting the nail depth proves difficult, choose a setting that under drives the nail. (Drive under driven nails snug with a smooth faced hammer. Does not apply for installation to steel framing).

3.5 MISCELLANEOUS

A. Cut Edge Treatment

- 1) Caulk, paint or prime all field cut edges. Manufacturer touch-up kits are required to touch-up ColorPlus products.

B. Caulking

- 1) For best results use an Elastomeric Joint Sealant complying with ASTM C920 Grade NS, Class 25 or higher or a Latex Joint Sealant complying with ASTM C834. Caulking/Sealant must be applied in accordance with the caulking/sealant manufacturer's written instructions. NOTE: OSI Quad as well as some other caulking manufacturers do not allow tooling.

C. ColorPlus® Technology Caulking, Touch-Up & Laminate

- 1) Care should be taken when handling and cutting James Hardie® ColorPlus® products. During installation use a wet soft cloth or soft brush to gently wipe off any residue or construction dust left on the product, then rinse with a garden hose.
- 2) Touch up nicks, scrapes and nail heads using the ColorPlus® Technology touch-up applicator. Touch-up should be used sparingly. If large areas require touch-up, replace the damaged area with new HardiePlank® lap siding with ColorPlus® Technology.
- 3) Laminate sheet must be removed immediately after installation of each course.
- 4) Terminate non-factory cut edges into trim where possible, and caulk. Color matched caulks are available from your ColorPlus® product dealer.
- 5) Treat all other non-factory cut edges using the ColorPlus Technology edge coat, available from your ColorPlus product dealer.

D. Painting James Hardie® Siding and Trim Products with ColorPlus® Technology

- 1) When repainting ColorPlus products, James Hardie recommends the following regarding surface preparation and topcoat application:
 - a) Ensure the surface is clean, dry, and free of any dust, dirt, or mildew.
 - b) Repriming is normally not necessary.
 - c) 100% acrylic topcoats are recommended.
 - d) DO NOT use stain, oil/alkyd base paint, or powder coating on James Hardie® Products.
 - e) Apply finish coat in accordance with paint manufacturers written instructions regarding coverage, application methods, and application temperature.
 - f) DO NOT caulk nail heads when using ColorPlus products, refer to the ColorPlus touch-up section.

E. Additional Handling Requirements

- 1) To prevent damage to the drip edge, extra care should be taken when removing planks from the pallet, while handling, and when installing with a lap gauge. Plans are interlocked together on the pallet, therefore they should be removed from the pallet horizontally (side to side) to allow planks to unlock themselves from one another.

◆ END OF SECTION ◆

SECTION 07 61 00
SHEET METAL ROOFING SYSTEM

1. PART 1 - GENERAL

1.1 SCOPE

- A. The work under this Section is under alternate 2 and includes, but is not limited to the following: All miscellaneous items required to complete the intent of this specification is the responsibility of this contractor, whether same is specified herein, or shown on the drawings.
- 1) Standing seam metal roofing system with no exposed fasteners complete with insulation, ice guard, gutters & snow guards, downspout conductors, etc. If additional support structure is required over and above what are shown on the plans they are the responsibility of this Contractor.
 - 2) Such other items as may be required to complete the roofing system.
 - 3) All connection bolts, fasteners, closures, sealer and other items as may be required.
 - 4) All required flashings
 - 5) All fascia trim at rake of metal roof.
 - 6) All seals to make roofing system water tight.
 - 7) Miscellaneous anchoring of metal roof support structure to masonry walls.
 - 8) All flashing for vent stacks and electrical conduit penetrations.

1.2 RELATED WORK

- A. Sheet Metal Flashing and Trim – Section 07 62 00
B. Joint Sealants – Section 07 92 00

1.3 SUBMITTALS

- A. Provide shop drawings, clip locations, and engineering data.
- B. Samples
- 1) Submit samples and color chips for all proposed finishes

1.4 APPROVED MANUFACTURERS

- A. The standing seam shall be a right angle at the base with no stepping of the metal. Panels. Panels manufactured by Butler Building Systems, Dimensional Metals Inc, Architectural Metal Systems, Inc. and Metal Sales Manufacturing, Ultra Seam,

Metal systems, Inc., MBCI Metal Roof, McElroy Metal and Wall Systems are acceptable.

1.5 QUALITY ASSURANCE

- A. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1) Mock-up shall include the full roof system including, insulation, ice dam and sheathing.
 - 2) Mock-up can be part of final product.
 - 3) Do not proceed with remaining work until workmanship, color, and pattern are approved by Architect.
 - 4) Rework Mock-Up area as required to produce acceptable work.
 - 5) Mock-up to be done before the pre-installation meeting.
- B. Pre-installation Meeting – Conduct a pre-installation meeting at the site prior to commencing work of this section: Require attendance of entities directly concerned with roof installation. Agenda will Include:
 - 1) Installation procedures and manufacturer's recommendations
 - 2) Safety Procedures
 - 3) Coordination of installation of other work
 - 4) Availability of roofing materials
 - 5) Preparation and approval of substrate and penetrations through roof.
 - 6) Review of mock-up.
 - 7) Other items related to successful execution of work.
- C. Manufacturer Sign off – A representative from the roofing manufacturer to make a minimum of three site visits to observe and sign off on the work. These visits are as follows:
 - 1) Attend the pre-installation meeting and review the mock-up.
 - 2) At least one site visit during construction to observe work.
 - 3) Attend the final punch list to review the final product.

2. PART 2 - PRODUCT

2.1 ROOF SYSTEM

- A. The roof shall be covered with precision roll formed VSR panels as supplied by Butler, Architectural Metal Systems, or equal by Dimensional Metals Inc., Metal Sales Manufacturing, Ultra Seam. Metalworx Systems, Inc. MBCI Metal Roof and Wall Systems, and McElroy Metal Maxima Panel. **Note: Continuous panels with no lap joints in the panel allowed.**
- B. Details shall be in accordance with the manufacturer's drawings for installation over insulation on wood deck.
- C. Installation shall be in accordance with the manufacturer's drawings for installation over insulation on wood deck.
- D. Color to be selected by owner from manufacture's standard color chart. Color sample shall be submitted for final approval.

2.2 ROOF PANELS

- A. Roof Panel Description - Non embossed steel with cold formed configuration designed as Steelox panels. Two-inch deep interlocking male and female ribs spaced 16" O.C.
- B. Butler VSR Roof Panel Description - Roof panels shall be roll formed VSR (Versatile Standing Seam Roof) panels as manufactured by Butler Manufacturing Company; 16" wide with 2 major corrugations 2" high, 16" on center between and parallel to the major corrugations.
- C. Panel materials shall be: 22-gauge galvalume sheet steel. Base metal is steel tested to meet or exceed a minimum yield of 50,000 psi. coated by the continuous hot-dip method uniformly on both sides with an aluminum zinc alloy. Minimum weight of coating, by tripe-spot test, is 0.55 oz determined in accordance with ASTM A792. Paint shall be 70% Fluro/Kynar of manufacturer's standard colors.
- D. Ridge assembly shall be designed to allow roof panels to move lengthwise with expansion/contraction as the roof panel temperature changes. Parts shall be factory prepunched for correct field assembly.
- E. Panel clips shall be the manufacturer's standard for installation over insulation on wood deck. Provide bearing plates for panel clips on insulation board. Fasteners to extend down through the insulation per manufacturers requirements.

2.3 SNOW GUARDS

- A. Furnish and install continuous snow guards on roof. Install snow guards just upslope from plumbing vent stacks and lightning protection, coordinate with lightning protection contractor.

- B. Provide snow guard as manufactured by metal roofing manufacture or by one of the following if approved by roofing manufacturer:

- 1) Alpine Snow Guards - Snow Fence
- 2) LM Curbs - S-5 Sno Fence
- 3) S-5! Sno Fence
- 4) Berger Bros. Co. - F-Rail
- 5) Snow Management Systems - 2 Pipe
- 6) Snow guards shall be stainless steel.

2.4 ICE DAM MATERIAL

- A. Install ice dam on wood deck over the entire field of the roof prior to the installation of the metal roof system.
- B. Ice dam material shall be by metal roofing manufacture or by one of the following if approved by roofing manufacturer:
 - 1) CertainTeed "WinterGuard": ASTM D1970 sheet barrier of self-adhering rubberized asphalt membrane shingle underlayment having internal reinforcement and "split" back plastic release film; provide material warranty equal in duration to that of shingles being applied.
 - 2) Equals by Owens Corning, GAF or approved equals.
- C. Weather-lap and seal watertight with asphalt roofing cement items projecting through of mounted on roof. Avoid contact of solvent-based cements with WinterGuard

2.5 MISCELLANEOUS ITEMS

- A. All items such as fasters, hip and ridge closures, sealants, etc, to be by supplied by the metal panel manufacturer and meet their requirements.
- B. **Fasteners shall not penetrate the roof sheathing and be laid out per the roofing manufacture's to meet the uplift requirements.**

2.6 SYSTEM DESIGN

- A. All components of the roof paneling system shall be designed in accordance with sound engineering methods and practices.
- B. Roof panels shall be designed in accordance with AISI "Specifications for the Design of Light Gauge Cold Formed Steel Structural Members," latest edition.
- C. All endwall trim and roof transition flashings shall allow the roof panel to move relative to the wall panels as the roof expands and contracts with temperature changes.
- D. Safety equipment, as required by safety standards, shall be provided by the erecting contractor to provide worker safety during panel installation.

3. PART 3 - INSTALLATION

3.1 GENERAL

- A. Erect all components in the sequence recommended by the manufacturer.

3.2 PANEL INSTALLATION

- A. There shall be no end lap panels; the panels are to be continuous.
- B. Erect roof panel in accordance with the manufacturer's instructions.
- C. Competent and skilled sheet metal applicators familiar with the manufacturer's products, standard details and recommendations. Applicator shall have at least two (2) years experience applying these types of materials with successful completion of projects with similar scope and is an approved installer with company-issued documentation accordingly. Installers shall be thoroughly trained and experienced in the necessary crafts and who are completely familiar with and comply to the recommendations and details of the manufacturer and the —Architectural Sheet Metal Manual published by SMACNA. Installers shall follow the manufacturers' installation details without exception unless written authorization from the manufacturer and architect are provided on an installation detail revision. Detail revision authorization must be made in advance of product installation.

3.3 FASTENERS

- A. Insulation, bearing plates and panel clips shall be fastened to per manufacturer's erection drawings.
- B. All connections of panels to structural members, except at eave, shall be made with clips with movable tabs that are seamed into the standing seam sidelaps.
- C. Fasten system as required by the roofing manufacturer to meet the uplift requirements.

3.4 ACCESSORIES

- A. Accessories, ventilators, gutter, fascia, etc. shall be as standard with Roof Manufacturing Company, unless otherwise noted and furnished as specified. Location of standard accessories shall be as shown on erection drawings, as furnished by roof Manufacturing Company.
- B. See section 07 62 00 for more information.

3.5 U.L. UPLIFT RATINGS

- A. The roof system shall carry a U.L. wind uplift classification Class 90 rating to ensure structural integrity and possible reduction of insurance rates.

3.6 WARRANTY

- A. Upon completion of the project, the Manufacturer shall issue to the Owner a 20 year Written Warranty to repair any leaks in the roofing system which are caused by defects in materials or workmanship, for a period of 20 years. The manufacturer shall also issue to the Owner a 20 year written warranty covering paint finish against cracking, checking, blistering, peeling, flaking, chipping, chalking and fading. Roof panels produced with carbon coating produced with Kynar 500 or Hylar 5000 resin.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED WORK

- A. Sealants and Caulking - Section 07 92 00

1.2 SECTION INCLUDES

- A. Shop and field formed accessories and trim such as fascia, gutters, downspouts, reglets, and flashing.

1.3 PERFORMANCE REQUIREMENTS

- A. High performance edge details must be selected from manufacturers who certify performance to meet design requirements, based upon testing of such products using the test methodologies RE-1, RE-2, and/or RE-3 as referenced by the SPRI "Wind Design Guide for Use with Low Slope Roofing" (April 1994). Other designs may be used, provided they are tested and certified to meet wind resistance and termination tests established for the projects building height, ground roughness factor, local wind speeds, and geographic location.
- B. Uplift requirements shall match requirements specified for adjacent membrane roofing.
- C. Wind resistance calculation will be designed specifically for the current project.
- D. All exterior sheet metal and metal roofing shall come from the same manufacturer and supplier so the color and appearance matches.

1.4 SUBMITTALS

- A. Samples
 - 1) Submit samples and color chips for all proposed finishes.

1.5 QUALITY ASSURANCE

- A. Mock-Up: Provide a mock-up for evaluation of construction techniques and application workmanship.
 - 1) Mock-up shall include the eave/cornice flashing as detailed on drawings.
 - 2) Finish areas designated by Architect
 - 3) Do not proceed with remaining work until workmanship and color are approved by Architect.
 - 4) Rework Mock-Up area as required to produce acceptable work.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. G90 galvanized steel sheet of thickness indicated on drawings, or specified hereint.
- B. Elastic cement shall be a mixture of asphalt and synthetic fibers and conforming to ASTM SS-C-153.

2.2 GUTTERS AND DOWNSPOUTS

- A. Gutters and Downspouts: Manufacture or fabricate gutter complete with end pieces, outlet tubes, and other accessories as required. Furnish flat-stock gutter spacers and gutter brackets from same material as gutters, of size recommended by SMACNA, but not less than twice the gutter thickness. Fabricate expansion joints, expansion-joint covers, and gutter accessories from same metal as gutters.
- B. Gutters & downspouts shall be fabricated from galvanized steel, ASTM Specifications A525, G90 coating latest issue and be minimum 22 gauge.
- C. Gutters and downspouts shall have a factory finished paint application. Paint shall be 70% Fluor/Kynar of manufacturer's standard colors. Gutters shall be supported by painted galvanized steel hangers. Gutter support brackets shall be spaced at 2'-8" O.C.
- D. Provide gutter expansion joints spaced not more than 40'-0" O.C. cap each end of gutter and leave gap between gutter ends at each expansion joint location. Provide metal cover over expansion joint to hid expansion joint gap.
- E. Downspout conductors shall be 3" x 4" (see roof plan for locations). Securely anchor the conductor to the wall with anchors at 4'-0" O.C.
- F. Provide downspout boots at all new and existing downspout locations.
- G. Provide stainless steel meh gutter guard at all gutters.

2.3 FASCIA

- A. Provide fascia with shop mitered and welded corners. Include anchor plates, cleats or other attachment devices; concealed splice plates; and trim and other accessories indicated or required for complete installation, with no exposed fasteners.
 - 1) Galvanized steel, 22 gauge.
 - 2) Fascia shall have a factory finished paint application. Paint shall be 70% Fluor/Kynar of manufacturer's standard colors.

2.4 SOFFIT PANELS

- A. See specification section 07 31 13 Asphalt Shingles.

2.5 REGLETS

- A. General: Provide reglets of type, material, and profile indicated, compatible with flashing. Form to securely interlock with counterflashing.
- B. Masonry Type: Provide with offset top flange for embedment in saw cut masonry joint to match slope of roof.
 - 1) Galvanized Steel Sheet: 22 gauge, 0.028 inch (0.55 mm) thick.
- C. Flexible Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing.
- D. Counterflashing Wind Resistant Clips: Provide clips to be installed before counterflashing to prevent wind uplift of the counterflashing's lower edge.

2.6 COUNTERFLASHING

- A. Provide counterflashing fabricated from the same metal as reglets and compatible with reglet system installed.
- B. Provide counterflashing fabricated from the following metal in thickness indicated:
 - 1) Painted, metallic-coated steel sheet: 22 gauge, 0.028 inch.

2.7 FINISHES

- A. Finishes
 - 1) Fluoropolymer, 70 percent Kynar 500, 2 coat system, complying with AAMA 605.2. Color to be chosen from manufacturer's eight (8) standard colors.

3. PART 3 - EXECUTION

3.1 FABRICATION AND INSTALLATION

- A. General: Install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Elastomeric and rigid joint sealants, caulking compounds, and related accessories.
- B. Provide joint sealants as a minimum in the following locations. Project specific materials and building systems may require additional joint sealants to be provided beyond the locations listed below.
 - 1) Exterior joints in vertical surfaces and nontraffic horizontal surfaces:
 - a) Cast-in-place concrete.
 - b) Control and expansion joints in unit masonry.
 - c) Perimeter joints between concrete and other dissimilar materials.
 - d) Frames of doors and windows.
 - e) Ceiling and overhead surfaces.
 - f) Exterior joints between dissimilar materials where the joining of the 2 surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to form a barrier against the passage of liquids, solids, or gases.
 - g) Or as noted on drawings
 - 2) Exterior joints in horizontal traffic surfaces:
 - a) Cast-in-place concrete slabs.
 - b) Tile control and expansion joints.
 - c) Exterior joints between dissimilar materials where the joining of the 2 surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to form a barrier against the passage of liquids, solids, or gases.
 - d) Or as noted on drawings
 - 3) Interior joints in vertical surfaces and horizontal nontraffic surfaces:
 - a) Exposed interior surfaces of exterior walls.

- b) Perimeter joints of exterior openings.
 - c) Between tops of masonry walls and underside of concrete slabs and beams.
 - d) Tile control and expansion joints.
 - e) Vertical control joints on exposed surfaces of unit masonry and concrete walls.
 - f) Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
 - g) Perimeter joints of toilet fixtures.
 - h) At joint between wall (or cabinet) and backsplash of countertops.
 - i) Around perimeter of fire extinguisher cabinets.
 - j) Interior joints between dissimilar materials where the joining of the 2 surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to form a barrier against the passage of liquids, solids, or gases.
 - k) Or as noted on drawings.
- 4) Interior control and expansion joints in horizontal traffic surfaces:
- a) Cast-in-place concrete.
 - b) Tile flooring.
 - c) Interior joints between dissimilar materials where the joining of the 2 surfaces leaves a gap between the meeting materials or components as may be dictated by the various methods of construction to form a barrier against the passage of liquids, solids, or gases.
 - d) Or as noted on drawings.

1.2 DEFINITIONS

- A. Caulking Compound - A compound to fill a static void but not used to seal a void against moisture or gas penetration or to withstand weathering.
- B. Sealants - A material that has adhesive or cohesive properties to form a barrier against the passage of liquids, solids, or gases and withstands weathering.
- C. Primer - A compound applied to the sides of an open joint to ensure adhesion of

caulking compound or sealant.

- D. Caulking - To install or apply either a caulking compound or sealant, across or into a joint, crack or crevice.
- E. (Note: The terms "Joint Sealant" and "Sealant" as used on the drawings do not refer to "Caulking Compound" as described above.)

1.3 SAMPLES

- A. Submit to the Architect supporting literature of each type of sealant (including necessary primers) proposed for the project. Literature shall indicate that the proposed material meets or exceeds all specified requirements and standards.
- B. Inspect all caulking and sealants used around window and doors. Should sealant appear to be cracked and dried, cut caulking and joint sealant, clean area in question and reseal.

1.4 PRECONSTRUCTION TESTING

- A. Preconstruction Adhesion Testing
- B. Preconstruction Field Adhesion Testing

1.5 QUALITY ASSURANCE

- A. Use experienced personnel to perform all cleaning, priming and caulking. Upon completion, all joints shall be smooth and clean and free of stains.
- B. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1) Warranty Period: Two years

1.6 SUBMITTALS

- A. Product data. For each product used.
- B. Color Samples
- C. Pre-construction Test Reports: From joint sealant manufacturer
- D. Sample Warranties: From joint sealant manufacturer.

1.7 WARRANTY

- A. Product shall provide a minimum performance guarantee:
 - 1) Butyl sealants: 2-year manufacturer's warranty

- 2) Polyurethane and latex (interior) sealants: 5-year manufacturer's warranty
- 3) Architectural silicone sealants: 20-year manufacturer's warranty.

2. PART 2 - PRODUCTS

2.1 PRIMER

- A. Sealant manufacturer shall recommend the primer to be used with the particular materials forming the joint.

2.2 CAULKING COMPOUND

- A. Oil-base caulks shall not be used on this project.

2.3 GENERAL REQUIREMENTS

- A. Primer shall be used as required by the manufacturer to obtain the best possible adhesion to the joint faces.
- B. Colors shall be as selected by the Architect.

2.4 SEALANT BACKUP MATERIAL

- A. Cylindrical foam backer rod complying with ASTM C1330 and as recommended by the sealant manufacturer.
- B. Asphalt or bitumen impregnated backer rods are not permitted.
- C. Backer rods shall have a diameter 25 to 30 percent greater than the joint width.

2.5 LIST OF APPROVED MATERIALS

- A. Type "A" Butyl Rubber, Non-skinning butyl, non-curing
 - 1) Tremco "TremPro JS-773"
 - 2) Pecora "BA-98"
 - 3) Sika "SikaLastomer-511"
- B. Type "B" Polyurethane
 - 1) Pourable (Self-Leveling)
 - a) Tremco "Vulkem 45 SSL"
 - b) Master Builders Solutions "MasterSeal SL1"
 - c) W.R. Meadows "Pourthane SL"

- d) Pecora Corporation “Dynatrol II-SG”
 - 2) Gun Grade, Nonsag, General use
 - a) Tremco “Dymonic FC” or “Dymeric 100”,
 - b) Sika “Sikaflex-2c NS”
 - c) Master Builders Solutions “MasterSeal HY 35” or “MasterSeal NP 2”
 - d) Pecora Corporation “Dynatrol II” or “Dynatrol I-XL Hybrid”
 - 3) Self-Leveling, Nonsag, Traffic Grade:
 - a) Tremco “THC 900/901”
 - b) Master Builders Solutions “MasterSeal SL 2/SL 2 Slope grade”
 - c) W.R. Meadows “Pourthane NS”
 - d) Pecora Corporation “Dynatred”
- C. Type “C” Silicone: Moisture curing, one part silicone sealant meeting the specified requirements of ASTM C920, Type S, Grade NS, uses NT, G, A, O.
 - 1) Gun Grade, Nonsag:
 - a) Dow Corning Corp. # “790”
 - b) Tremco “Tremsil 400” or “Spectrem 2”
 - c) Pecora Corporation “864 NST” or “895 NST”
- D. Backer Rod
 - 1) As recommended by the manufacturer or
 - a) “SOF Rod” by Nomaco
 - b) “Backer rod” by Hohmann & Barnard, Inc.
 - c) “Kool-Rod” by W.R. Meadows
 - d) “MasterSeal 920/921” by Master Builders Solutions

3. PART 3 - INSTALLATION

3.1 INSTALLATION – GENERAL

- A. Install sealant in joints sized per manufacturer's recommendations using procedures in ASTM C1193.

3.2 SEALANT SCHEDULE

- A. Type "A" (Butyl)
 - 1) Used only for interior vertical joints in concealed locations where no movement is anticipated. For metal panel joints.
- B. Type "B" (Polyurethane)
 - 1) "Pour Grade" - For interior or exterior horizontal joints.
 - 2) "Gun Grade" - Limited to interior vertical expansion and control joints. Exterior general purpose.
 - 3) "Self-Leveling" - For all exterior concrete pavement / pads, interior cold storage building, salt storage building, brine shelter, expansion/control/construction joints (except for fuel island). Including interior room truck storage concrete floor slab expansion/control/construction joints.
- C. Type "C" (Silicone)
 - 1) "Gun Grade"
 - a) Glazing Sealant
 - b) Exterior vertical expansion and control joints or exterior static joints

3.3 JOINT PREPARATION

- A. Remove all loose and scaled material, by mechanical means as required, and remove all foreign matter such as dirt, dust, oil grease, form release agents, moisture and lacquer. Vitreous or glazed surfaces must be sanded.

3.4 PRIME

- A. Prime joints as required by the manufacturer to achieve the best possible adhesive bond between sealant and joint walls.
- B. Mask joints as required to limit primer application strictly to sealant contact surface and prevent staining of surrounding surfaces.

3.5 SEALANT BACKER ROD

- A. Install backer rod without damaging the rod's skin and to a depth of approximately 50% of the width of the joint, but not less than 1/4 inch or more than 1/2 inch. Where joint is not sufficient to allow rod installation, use polyethylene bond-breaking tape, upon approval of the Architect.
- B. Avoid stretching backer rod during installation.
- C. In horizontal joints, subjected to traffic, the backer rod or tape shall be supported on non-asphaltic expansion joint filler such as remolded urethane or neoprene.
- D. Note: Sealant Backer Rod shall not be used in joints between precast concrete panels.

3.6 SEALANT PREPARATION

- A. Ensure mixing of two component sealants are done according to the manufacturer's directions. Mix slowly to avoid overheating.
- B. Sealants that have exceeded the manufacturers "SHELF LIFE" shall be removed from the project site.

3.7 SEALANT APPLICATION

- A. Apply sealant into base of joint recess, free of air pockets, until joint is completely filled. Tool all joints to a smooth surface.
- B. Joints in masonry and concrete shall be tooled to smooth concave surface. Joints in horizontal traffic areas shall be tooled smooth and flat and depressed approximately 1/16 inch below top of traffic wear surface.
- C. Remove all masking tape before initial sealant set.

3.8 CLEAN-UP

- A. All non-porous surfaces shall be cleaned immediately with solvent moistened cloth. Clean-up porous surfaces by wire brushing or sanding after sealant has cured.
- B. All surfaces not specified or detailed to receive sealant, shall be clean and free from sealant or primer compounds or stains upon completion of the project.

◆ END OF SECTION ◆

SECTION 08 11 13
HOLLOW METAL FRAMES

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hollow metal door frames, including all materials, labor, equipment, appliances, anchors and services required or necessary for their installation. Preparation for all hardware that are shown on the drawings or specified herein shall be properly installed and made fully operative. Door frames must be of a single manufacturer.

1.2 HARDWARE

- A. The hardware supplier will furnish approved hardware schedules, paper templates and physical hardware to the door and frame manufacturer, as required. See section 08 71 00.

1.3 MANUFACTURERS

- A. Frame and construction equal to Steelcraft standard method and design, contour dimensions and section widths as specified or shown on the drawings.
- B. Hollow metal frames shall be manufactured by Steelcraft Manufacturing Company, Cincinnati, Ohio or equal as manufactured by the Pioneer Fireproof Door Co., Carlstadt, N.J.; Amweld, Niles, Ohio; Kewanee Manufacturing Co., Kewanee, Illinois; Republic Steel; or approved equal.

1.4 SUBMITTALS

- A. Submit for review, the hollow metal shop drawings covering complete identification of all items required for the project. Include manufacturer's names and identification of product. Include complete copies of catalog cuts and/or technical data sheets and any other data as may be required to show compliance with these specifications.
 - 1) The data on the Shop Drawings will complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Architect to review the information as required.
- B. Indicate frames configuration, anchor types and spacings, location of cutouts for hardware, reinforcement, to ensure doors and frames are properly prepared to receive hardware.
- C. Submit manufacturer's installation instructions.

1.5 DELIVERY, STORAGE AND PROTECTION

- A. Storage of Frames

- 1) Store frames under cover on 4" wood sills on floors in a manner that will prevent rust and damage. Do not use non-vented plastic or canvas shelters, which create a humidity chamber and promote rusting. Store assembled frames in a vertical position, five units maximum in a stack. Provide a 1/4" space between frames to promote air circulation.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Frames and frame components shall be manufactured from cold-rolled steel conforming to ASTM specification A1008: or hot-dipped galvanized steel having an A60 zinc coating conforming to ASTM specification A653.
 - 1) Galvanized steel shall be treated to insure proper paint adhesion.
 - 2) All component parts used in galvanized door frames shall meet the galvanized specification.

2.2 STEEL FRAMES

- A. Interior Frames: Welded type, mitered corners 16 gauge (0.053") sheet steel for single openings up to 40" wide and double openings up to 60" wide. 14 gauge sheet steel for openings beyond these widths.
- B. Finish: Factory primed and field painted.
- C. Provide anchors of suitable type for positive anchorage of frame to the indicated type of wall construction. Provide a minimum of three (3) anchors per jamb per height of 7'-2" and one (1) anchor for each two (2) feet of additional height or fraction thereof.
- D. Provide ALL frames with 8-gauge reinforcement plates at hinge, strike, and closer locations.
- E. Provide ALL frames with adjustable base anchors for rigid anchorage to the floor.
- F. Provide ALL frames with at least two (2) 9/32" holes for the insertion of G-J 64 rubber door silencers, furnished by this Contractor.
- G. Reinforce storm door frames to be compliant with ICC 500 standards.
- H. Electrical Requirements:
 - 1) General: Make provisions for installation of electrical items arranged so that wiring can be readily removed and replaced.
 - 2) Provide all cutouts and reinforcements required for metal door frame to accept electric components.

- 3) Frames with Electrical Hinges: Weld UL listed back box and mortar shield at center hinge location. Top or bottom hinge locations are not permitted.

2.3 FINISH

- A. Frame components shall be cleaned, phosphatized and finished with one coat of baked-on rust inhibiting prime paint in accordance with the ANSI A224.1 "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames".

3. PART 3 - EXECUTION

3.1 FRAMES

- A. Drywall Partitions
 - 1) Use drywall frames with mitered interlocking corners and double return backbands and stud anchors designed to prevent frame twisting or movement. Frames shall be shop welded.
- B. Completely clean and degrease doors and frames and factory apply primer. Prior to field finish painting, doors and frames shall be thoroughly cleaned and free of oil, dirt and/or dust.
- C. The doors and frames shall be properly packaged and protected for shipment to jobsite. The Contractor shall inspect the doors and frames on arrival at jobsite to ensure they are in perfect condition, and thereafter be responsible for their protection through the completion of the project.

3.2 ADJUSTING

- A. Final Adjustments: Check and readjust operating hardware items just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames that are warped, bowed, or otherwise unacceptable.
- B. Prime Coat Touch-Up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer.

3.3 PROTECTION

- A. General Contractor to provide protective measures required throughout the construction period to ensure that door frame units will be without damage or deterioration, other than normal weathering, at time of acceptance.

◆ END OF SECTION ◆

1. **PART 1 - GENERAL**

1.1 RELATED DOCUMENTS

- A. Drawings and General Provisions of Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to work specified in this section.

1.2 DESCRIPTION OF WORK

- A. The extent of each type of door and frame is shown on the drawings and in schedules.
- B. The following types of doors and frames are required:
 - 1) Aluminum frames for entrances
 - 2) Aluminum medium stile doors and panels

1.3 RELATED WORK SPECIFIED ELSEWHERE

- A. For Joint Sealants, see Section 07 92 00

1.4 SYSTEM PERFORMANCE

- A. Provide door assemblies that have been designed and fabricated to comply with requirements for system performance characteristics listed below, as demonstrated by testing manufacturer's corresponding stock systems according to test methods designated.
- B. Thermal Transmission (Exterior Doors) "U"-value of not more than 0.09 (BTU/Hr. x sf x degrees F) per AAMA 1503.01.

1.5 QUALITY ASSURANCE

- A. Standards: Comply with the requirements and recommendations in applicable specifications and standards by NAAMM, AAMA, and AA, including the terminology definitions, and specifically including the "Entrance Manual" by NAAMM except to the extent more stringent requirements are indicated.
- B. The manufacturer, and/or his representative shall visit this project and instruct the installers in the proper installation of the door and Frame assemblies.
- C. Field Measurement: Take field measurements prior to fabrication of doors and frames to ensure proper fitting of assemblies and show recorded measurements on final shop drawings. Successful bidders are expected to field verify all dimensions, sizes, quantities and the material required to complete this project. Failure to do so will not relieve the successful contractor from the necessity of

furnishing any and all materials that may be required, without any additional costs to the Owner. Coordinate fabrication schedule with construction progress as directed by Contractor, and avoid delays of the work.

1.6 SUBMITTALS

- A. Product Data: Submit door manufacturer's product data, specifications and instructions for each type of door and frame.
 - 1) Include details of core, stile and rail constructions including trim for lights and similar components.
 - 2) Include details of finish hardware mounting.
 - 3) Include samples of each Aluminum and finish as required of the alloys to be used on this project. Where normal color and texture variations are expected, include two or more units in each sample as required to show the range of such variation.
 - 4) Architect reserves the right to require samples of typical fabricated section, showing joints, exposed fastenings (if any), quality of workmanship, hardware and accessory items, before fabrication of the work proceeds.
- B. Submit shop drawings for the fabrication and installation of the doors and Frames and associated components of the work. Include wall elevations at 1/2" scale and half-sized detail sections of every typical composite member. Show anchors, joint system, expansion provisions, and other components not included in the manufacturers' standard data. Include glazing details.

1.7 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. All materials supplied shall be delivered to the job site in their original unopened packages, with labels intact. Materials shall be inspected for damage, and the manufacturer shall be advised at once of any discrepancies. Unsatisfactory materials are not to be used.
- B. All materials supplied shall be packaged in individual corrugated cartons. Doors shall be "floated" within cartons, with no portion of the door having contact with the outer shell of the container.

1.8 SPECIAL PROJECT WARRANTY

- A. Provide a written warranty signed by Manufacturer, Installer and Contractor agreeing to replace at no cost to the Owner, any doors, frames, or hardware that fail in materials or workmanship, within the time period of acceptance as indicated below. Failure of materials or workmanship includes excessive deflection, faulty operation of entrances, deterioration of finish, or construction in excess of normal weathering and defects in hardware, weather stripping and other components of the work.

- B. Minimum Time Period of Warranty: Two years for substantial completion.

1.9 ACCEPTABLE MANUFACTURERS DOORS AND FRAMES

- A. Manufacturer: Subject to compliance with requirements, provide products of one of the following or approved equal:
 - 1) Kawneer 500 wide style door with 3½" mid rail. Equal by PPG and Tubelite.
 - 2) MS-400-F 4" styles with 8" top, bottom and mid-rails. Fluted #10 Patten Aluminum Doors - Cross Aluminum Products, Dowagiac, Michigan.
 - 3) Capitol Aluminum "Heavy Duty" aluminum door with minimum 4 ½ " mid rail; Bellevue, Ohio.
 - 4) Tube lite, Reed City, Michigan wide style door.
- B. Electronic Lock Requirements
 - 1) Verify with electronic door lock hardware supplier the minimum vertical style width for installation of the electric lock.

2. PART 2 - PRODUCTS

2.1 MATERIALS AND ACCESSORIES

- A. Aluminum Members: Provide alloy and temper as recommended by manufacturer for strength, corrosion resistance, and application of required finish and control of color; ASTM 221 for extrusions, ASTM B 209 for sheet/plate, with a minimum wall thickness of 0.125".
- B. Fasteners: provide aluminum, non-magnetic stainless steel or other non-corrosive metal fasteners, guaranteed by the manufacturer to be compatible with the doors, frames, stops, panels, hardware, anchors, and other items being fastened. For exposed fasteners (if any), provide Phillips head flat screws with finish matching the time to be fastened.
 - 1) Do not use exposed fasteners, except where unavoidable for the assembly of units, or unavoidable for the fastening of hardware. provide only concealed screws in glazing stops.
- C. Reinforcement and Brackets: Manufacturer's standard formed or fabricated steel units of shapes, plates, or bars, with 2.0 ounce hot-dip zinc coating, complying with ASTM A123, applied after fabrication.
- D. Anchor Devices: Lead shield or toothed steel, drill-in, expansion bolt anchors, or Tapcon style anchors shall be used.

- E. Bituminous Coating: Cold applied asphalt mastic complying with SSPC-PS 12, compounded for 30-mil thickness per coat.
- F. Sealants and Gaskets: provide sealants and gaskets in the fabrication, assembly, and installation of the work which are recommended by the manufacturer to remain permanently elastic, non-shrinking, non-migrating and weatherproof.
- G. Glazing Gaskets: For glazing factory-installed glass, and for gaskets which are factory-installed glass, and for gaskets which are factory-installed in "Captive" assembly of glazing stops, provide manufacturer's standard stripping of molded neoprene, complying with ASTM D 2000 (Designation 2BC415 to 3 BC620), or molded PBC complying with ASTM C 509, Grade 4.
- H. Provide maximum recycled-content feasible for aluminum doors and frames.

2.2 FABRICATION

- A. Sizes and Profiles: The required sizes for door and frame units and profiles requirements are shown on the drawings.
 - 1) The details shown are based upon standard details by one or more manufacturers. It is intended that details by other manufacturers will be accepted, provided they comply with size requirements, and with minimum/maximum profile requirements as shown.
- B. Door shall be modified in width for continuous gear hinge installation.
- C. Complete the cutting, fitting, forming, drilling and grinding of all metal work prior to the cleaning, finishing, treatment and application for coatings. Remove burrs from cut edges, and ease edges and corners to a radius of approximately 1/64".
- D. No Welding of joints will be accepted.
- E. Conceal fasteners, whenever possible, except as otherwise noted.
- F. Maintain continuity of line and accurate relation of planes and angles. Provide secure attachments and support at mechanical joints, with hairline fit at contacting members.
- G. Reinforce the work as necessary for performance requirements and for support to the structure. Separate dissimilar metals with bituminous paint or preformed separators which will prevent corrosion. Separate metal surfaces at moving joints with non-metallic separators to prevent "Freeze-up" of joints.

2.3 STANDARD ALUMINUM DOORS

- A. QUALITY ASSURANCE
 - 1) Drawings and specifications are based upon the Series 350 doors as manufactured by the Kawneer Company, Inc.

- 2) Structural Resistance to corner racking shall be tested by the Dual Moment Load test as follows:
 - a) Test section consists of a standard top door corner assembly. Side rail section shall be 24" long and top rail section shall be 12" long.
 - b) Anchor "top rail" positively to test bench so that corner protrudes 3" beyond bench edge.
 - c) Anchor a lever arm positively to "Side rail" at a point 19" from inside edge of "top rail." Attach weight support pad at a point 19" from inner edge of "side rail."
 - d) Test section shall withstand a load of 500 pounds on the lever arm before reaching the point of failure, which shall be considered a rotation of the lever arm in excess of 45 degrees. See Section 1.9 of this specification for other approved manufacturers.
- 3) Air infiltration: (Applies to single acting offset pivot or butt hung entrances).
- 4) Air infiltration shall be tested in accordance with ASTM E 283, at a pressure differential of 1.567 P.S.F. (75 Pa). A single 3'0" x 7'0" entrance door and frame shall not exceed .50 CFM per linear foot of perimeter crack. A pair of 6'-0" x 7'-0" entrance doors and frame shall not exceed 1.0 CFM per linear foot of perimeter crack.

B. MATERIALS

- 1) Extrusions shall be 6063-T5 alloy and temper (ASTM B 221 alloy G.S. 10A-T5). Fasteners, where exposed, shall be aluminum, stainless steel or plated steel in accordance with ASTM A 164. Perimeter anchors shall be aluminum or steel, providing the steel is properly isolated from the aluminum. Glazing gaskets shall be EPDM elastomeric extrusions. Major portions of the door stiles shall be .125" (3.2) nominal in thickness and glazing molding shall be .050" (1.2) thick.

C. FABRICATION

- 1) See drawings for elevations for doors and rail and stile sizes.

Vertical Stile	4½" Min
Top Rail	4½" Min
Mid Rail	3½" Min
Bottom Rail	10" Min

- 1) Corner construction shall consist of both sigma deep penetration and sigma fillet welds and mechanical fastening. Interior glazing stops shall be square snap-in type with neoprene bulb type glazing. Square stops on exterior side shall be lock-in tamper proof type. No exposed screws shall be required to secure stops.
- 2) The door weathering on a single acting offset pivot or butt hung door and frame (single or pairs) shall be a thermoplastic elastomer weathering seal in a tubular shape with a semi-rigid polymeric backing. OPTIONAL - The door bottom rail will be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners.
- 3) The door weathering on a double acting, center pivoted door and frame (single or pairs) shall be pile cloth. OPTIONAL - The door bottom rail will be weathered with an EPDM blade gasket sweep strip applied with concealed fasteners.
- 4) The meeting stiles on pairs of doors shall be equipped with an adjustable astragal weatherstrip.

2.4 ALUMINUM FRAMING SYSTEMS

A. TUBULAR FRAMING

- 1) Aluminum framing system shall be 4½" x 2" flush glazed and shall not be less than .125" in wall thickness. type 6063-T5 aluminum alloy shall be used. Pile weatherstripping shall be used in all principal frame member stops.
- 2) All framing systems shall utilize a screw spline system for concealed fasteners. No welds or glues are acceptable.
- 3) All framing members in contact with the door shall be reinforced and premachined for hardware per manufacturer's standards, be approved hardware schedule and this Specification.
- 4) Anchors of a suitable type shall be used to fasten framing system to wall materials. A minimum of five anchors shall be used on all jamb and perimeter frame members up to 7'-4". Additional anchors are required over 7'-4". Please check this Specification for conditions which call for other anchoring conditions.
- 5) Framing systems shall come from the manufacturer in a knock-down condition and be assembled at the job site.

2.5 GLAZING

- A. Provide glazing system for doors and frames to receive lights. Design system for replacements or glass, but for non-removal of glass from the exterior. Glazing shall be 1" insulating glass for exterior doors only and ¼" tempered glass for interior vestibule doors. See section 08 81 00.

- 1) Provide manufacturer's standard "flush glazing" system of recessed channels and captive glazing gaskets.
- 2) Provide anchorage and alignment brackets for concealed support of assembly from the building structure. Allow for thermal expansion on exterior units.
- 3) Glass to be factory installed in doors.

2.6 SOLID PANEL DOORS

- A. The door panel shall consist of a solid core composition material with 0.40" #10 pattern fluted aluminum sheet laminated to both sides of it, yielding a panel of overall thickness not less than 7/8". Aluminum sheet to match the finish on the door.

2.7 ALUMINUM FINISHES

- A. Preparation: Prior to fabrication of doors and frames, prepare the aluminum surfaces for finishing in accordance with the aluminum producer's recommendations, and the standards of the finisher or processor. Process all components of each assembly simultaneously to attain complete uniformity of color.
- B. All exposed framing surfaces shall be free of scratches and other serious blemishes. Aluminum elements are to be finished with a Permacoat standard powder coated finish.
- C. Finishes: Door and frame components shall be furnished with a manufacturer standard white finish. Submit color sample to architect for approval.

2.8 FINISH HARDWARE

- A. Reinforce, cut, drill, and tap doors and frames as required to receive hardware, except to not drill and tap for surface mounted closers and holders, which are to be applied at the job site. Comply with hardware manufacturer's instructions and template requirements. Use concealed fasteners wherever possible.

2.9 TEMPLATES

- A. All necessary templates for accurate setting and fitting of finish hardware shall be furnished to Manufacturer in ample time to facilitate the manufacture of items for the project.

2.10 HARDWARE SETS

- A. All doors shall be equipped with hardware of the types listed in section 08 71 00. The Contractor is referred to the schedule and plans for the total number of each set required. Sets shall be supplied by door hardware vendor.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's recommendations and specifications for the installation of the doors and frames.
- B. Set units plumb, level and true to line, without warp or rack of doors or frames. Anchor securely in place. Separate aluminum and other corrodible metal surfaces, form sources of corrosion or electrolytic action at points of contact with other materials, with bituminous coating, or other means as approved by Architect. All joints between framing and the building structure shall be sealed in order to secure a watertight installation.
- C. Set thresholds in a bed of compound and backseal with appropriate sealant. Thresholds in more than one piece shall meet at mullion centers and be notched out on back side.
- D. Clean surfaces promptly after installation of doors and frames, exercising care to avoid damage to the protective coating (if any). Remove excess glazing and sealant compounds, dirt and other substances.
- E. After installation, the General Contractor shall provide protective treatment and other precautions required through the remainder of the construction period, to ensure that the doors and frames will be without damage or deterioration (other than normal weathering) at the time of acceptance. The General Contractor shall be responsible for final cleaning.
- F. Provide Owner with all adjustment tools and instruction sheets. Arrange an in service session to Owner at Owner's convenience. provide a minimum two-year written warranty on all labor related to this section. Any workmanship which is defective or deficient shall be corrected to the Owner's satisfaction and at not additional cost to the Owner.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED WORK

- A. Hollow Metal Frames - Section 08 11 13
- B. Door Hardware - Section 08 71 00
- C. Glass Glazing – Section 08 81 00
- D. Paints and Stains- Section 09 91 00

1.2 SUBMITTALS

- A. Submit the following:
 - 1) Catalog data for each type of wood door, including details of core and edge construction, trim for openings, and finishing specifications for doors to receive factory finish.
 - 2) Color and finish samples of factory finished doors for approval.
 - 3) Shop drawings indicating location, size, and hand of each door, elevation of each kind of door, details of construction, location and extend of hardware blocking, fire ratings, requirements for factory finishing and other pertinent data.
 - 4) Warrant as specified.

1.3 QUALITY ASSURANCE

- A. Quality Standards: Comply with the following standards:
 - 1) WDMA I.S. 1-A
- B. Manufacturer: Obtain all doors from a single manufacturer.

1.4 STORAGE & HANDLING

- A. Protect doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with requirements of referenced standards and recommendations of NWWDA pamphlet “How to Store, Handle, Finish, Install, and Maintain Wood Door”, as well as with manufacturer’s instructions.
- B. Identify each door with individual opening numbers which correlate with designation system used on shop drawings for door, frames, and hardware, using temporary, removable or concealed markings.

- C. Conditioning: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during remainder of construction period to comply with the following requirements applicable to project's geographical location:
 - 1) Referenced AWI quality standard including Section 100-S-3 "Moisture Content"
- D. Stack doors inside, protected from elements, in a manner to provide adequate ventilation and prevent warpage. Do not store or install in any part of the building until concrete, masonry and plaster work is dry.
- E. (Follow AWI 1300-G8 paragraph A standards in addition to above).

1.5 MANUFACTURERS

- 1) Mohawk
- 2) Algoma
- 3) Marshfield Door System
- 4) Eggers
- 5) Oshkosh Door Company is an approved manufacturer as long as they abide by all specifications and project requirements. Note wood doors are 5ply.

1.6 WARRANTY

- A. Manufacturer's lifetime warranty to include the following:
 - 1) Replacement
 - 2) Machining for all hardware
 - 3) Rehanging
 - 4) Refinishing

1.7 COORDINATION

- A. General Contractor shall be solely responsible for proper machining for hardware.

2. PART 2 - PRODUCTS

2.1 WOOD FLUSH DOORS

- A. General Requirements

- 1) Quality Standards: WDMA 1.S.1-A Performance Grade: Extra Heavy Duty
 - 2) Grade: Custom grade with "A" faces.
 - 3) Cut: Plain sliced or rotary cut.
 - 4) Species: White maple
 - 5) Match between Veneer Leaves: Book or slip match.
 - 6) Assembly of Veneer Leaves on Door Faces: Running match.
 - 7) The moisture content of all wood components shall average from 6 to 8 percent and shall be at equilibrium with the same relative humidity condition at the time of door fabrication.
 - 8) Door cores shall be free of urea-formaldehyde.
- B. 5 Ply Construction
- 1) Faces: For all wood doors in the addition and renovation space, door color and wood species to match existing door color and species. Provide sample of material to Architect prior to purchase of material.
 - 2) Cross Bands: Cross bands shall be thoroughly oven-dried hardwoods, 1/16" minimum thickness extending the full width of the door and laid with the grain at right angles to the face veneers.
- C. Core Construction
- 1) Particle board: Shall meet or exceed the requirements of Grade "1-L-1" as described in the latest edition of ANSI-A208.1 "Mat-formed Wood Particle board." Provide blocking for the acceptance of all hardware. Thru-bolt attachment of hardware is not permitted.
- D. Stiles (Vertical Edge Bands)
- 1) Doors with hardwood veneer faces shall have 1-3/8" wide 2-ply stiles made from thoroughly kiln-dried hardwood lumber. 1-3/8" stiles shall have mill option hardwood on the inner ply with outer ply compatible or matching to the face veneers. Stiles shall be laminated to the core with Type 11 glue.
- E. Rails (Horizontal Edge Bands)
- 1) Rails shall be thoroughly kiln-dried hardwood lumber, minimum 1-3/8" wide. Rails shall be laminated to core with Type 11 glue.
- F. Adhesive
- 1) 5-ply doors shall be laminated by hot press method with Type I glue.

G. Pre-machining

- 1) Prefit door to provide maximum clearance of 1/8" at sides and top and 3/4" at bottom unless otherwise specified. Prepare doors for hardware in accordance with approved hardware schedule. All premachined doors shall be identified with opening number.

H. Field Finishing

- 1) Follow WDMA Standards for field finishing.
- 2) Paint or Stain finish to be selected by architect.

I. Prefinishing (Contractor's option)

- 1) Interior doors shall be factory finished on all six sides and shall be equal to WDMA TR4 conversion varnish or TR-6 catalyzed polyurethane custom grade. All prefinished doors shall be individually poly-bagged. Poly-bags to be opaque to provide maximum protection from sunlight. Doors shall be finished per section 099100 if this option is not selected.
- 2) Paint or Stain finish to be selected by architect.

J. Carpentry

- 1) All lights and louvers shall be prepared in accordance with ANSI/NWMA Industry Standard I.S. I-80 Series.

K. Electrical Requirements:

- 1) General: Make provisions for installation of electrical items specified elsewhere; arrange so that wiring can be readily removed and replaced.
- 2) Doors with Electrical Hinges:
 - a) General: Provide with metal conduit raceway to permit wiring from electrical hinge to other electric door hardware.
 - b) Hinge and Pivot Location: Center or intermediate as applicable; top or bottom not permitted.

3. PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine door frames, after their installation, and doors, prior to their hanging, as follows:

- 1) Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
- 2) Verify that doors are free of defects that could cause their rejection.

3.2 INSTALLATION

- A. Condition doors to average prevailing humidity in installation area prior to hanging.
- B. Manufacturer's Instructions: Install wood doors to comply with manufacturer's instructions and of referenced AWI standard and as indicated.
- C. Job Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below. Machine doors for hardware. Seal cut surfaces after fitting and machining.
 - 1) Fitting Clearances: For doors provide clearances of 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering.
 - a) For undercut doors, provide clearances complying with NFPA 80.
 - 2) Bevel doors 1/8" in 2" at lock edges
- D. Prefit Doors: Fit to frames and machine for hardware to whatever extent not previously worked at factory as required for fit and uniform clearance at each edge.

3.3 APPLICATION OF HARDWARE

- A. Receive, store, and be responsible for finished hardware and properly tag, index, and file all keys in key cabinet or as directed. Apply hardware manufacturer's instructions, fit accurately, securely, and adjust carefully. Use care not to injure work when applying hardware. When necessary, remove and replace doors that they may have bottoms painted.
- B. Location of hardware in connection with doors as follows, unless otherwise shown.
 - 1) Center Door Knobs 38 inches above finished floor
 - 2) Center Door Pulls 40 inches above finished floor
 - 3) Center Push Plates 45 inches above finished floor
 - 4) Center Cylinder Deadlocks 52 inches above finished floor
 - 5) Center Single Push Bars 48 inches above finished floor
 - 6) Locate Upper Edge of Top Hinge 5 inches below head of frame

- 7) Locate Lower Edge of Bottom Hinge 10 inches above finished floor
- 8) Space Center Hinges equal distance between top and bottom hinges.
- 9) Cover door knobs and pulls with heavy cloth until painting is completed. Prior to completion of building, examine all doors, sash and other movable parts, adjust as required and leave hardware in good working order.

3.4 ADJUST AND CLEAN

- A. Operation: Rehang or replace doors which do not swing or operate freely, as directed by Architect.
- B. Finished Doors: Refinish or replace doors damaged during installation, as directed by Architect.
- C. Institute protective measures as recommended and accepted by door manufacturer to assure that wood doors will be without damage or deterioration at time of final acceptance.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including Instructions to Bidders, General and Supplementary Conditions and Division 1 Specification Sections, apply to the Work of this Section.
- B. Aluminum service window. See specification section 08 56 19 Service Window.

1.2 SUMMARY

- A. Section includes:
 - 1) Aluminum-framed storefronts interior and exterior as shown on drawings.

1.3 SYSTEM DESCRIPTION

- A. Aluminum-framed storefront system includes tubular aluminum sections with supplementary internal support framing, aluminum and glass entrances, shop fabricated, factory finished, glass and glazing, related flashings, anchorage and attachment devices.
- B. System Assembly: Site assembled.
- C. System should match in profile and finish aluminum curtain wall, aluminum windows, and aluminum door frames.

1.4 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Design glazed aluminum curtain walls, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.
- B. System Design: Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of wall, including building corners.
 - 1) Windloads: As calculated in accordance with applicable code, as measured in accordance with ASTM E330.
- C. Deflection: Limit mullion deflection to 1/175 for spans under 13'-6" and 1/240 plus 1/4 inch for spans over 13'-6" of span; with full recovery of glazing materials.
- D. System Assembly: Accommodate without damage to components or deterioration of seals, movement within system, movement between system and

peripheral construction, dynamic loading and release of loads, deflection of structural support framing.

- E. Air Infiltration: Limit air leakage through assembly to the following when measured in accordance with ASTM E283.
 - 1) Storefront Framing: 0.06 cfm/sq ft of wall area, measured with 6.24 psf differential pressure.
 - 2) Single Doors: 0.50 cfm per linear foot of crack, measured with 1.57 psf differential pressure.
- F. Air and Vapor Seal: Maintain continuous air barrier and vapor retarder throughout assembly, primarily in line with inside pane of glass.
- G. Condensation Resistance Factor (CRF): Measured in accordance with AAMA 1503.1.
 - 1) Storefront Framing: Minimum 50.
- H. Water Leakage: Measured in accordance with ASTM E331.
 - 1) Storefront Framing: None, when tested with 8.0 psf differential pressure.
 - 2) Thermal Transmittance (u-FACTOR): When tested to AAMA Specification 1503, the thermal transmittance (U-factor) shall be no more than:
 - a) Glass to Exterior: 0.47 BTU/hr/ft²/°F
 - b) Glass to Center: 0.44 BTU/hr/ft²/°F
 - c) Glass to Interior: 0.41 BTU/hr/ft²/°F
- I. Expansion / Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F over a 12 hour period without causing detrimental effect to system components and anchorage.
- J. System Internal Drainage: Drain water entering joints, condensation occurring in glazing channels, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.5 SUBMITTALS

- A. Shop Drawings:
 - 1) Indicate system dimensions, framed opening requirements and tolerances, affected related Work and expansion and contraction joint location and details.

2) Provide Manufacturer's calculations identifying mullions meet windload requirements.

3) Indicate locations to receive colored framing components.

B. Product Data:

1) Submit installation instructions, component dimensions; describe components within assembly, anchorage and fasteners, glass and infill, and internal drainage details.

C. Samples:

1) Submit color chips for color selection by architect.

D. Design Data:

1) Indicate framing member structural and physical characteristics and dimensional limitations.

E. Manufacturer's Certificate: Certify products meet or exceed specified requirements.

F. Professional Seal: Provide seal and signature on manual and computer calculations of Professional Engineer responsible for submittal.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA SFM-1 and AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.

B. Accessibility Requirements: Conform to ICC A117.1.

1.7 QUALIFICATIONS

A. Manufacturer and Installer: Company specializing in manufacturing aluminum glazing systems with minimum five years documented experience.

1.8 PRE-INSTALLATION MEETING

A. Convene minimum one week prior to commencing Work of this section.

1.9 DELIVERY, STORAGE, AND PROTECTION

A. Handle Products of this section in accordance with AAMA - Curtain Wall Manual #10.

1.10 ENVIRONMENTAL REQUIREMENTS

- A. Install sealants and glazing material when ambient temperatures over a 48 hour period after installation are within manufacturer's requirements.

1.11 COORDINATION

- A. Coordinate the Work with installation of firestopping, air barrier, vapor retarder, automatic entrance doors, and components or materials.

1.12 WARRANTY

- a) Special Warranty: Manufacturer and Installer agrees to repair or replace components of aluminum-framed entrances and storefronts that do not comply with requirements or that fail in materials or workmanship within specified warranty period.

[1] Failures include, but are not limited to, the following:

- [a] Structural failures including, but not limited to, excessive deflection.
- [b] Noise or vibration created by wind and thermal and structural movements.
- [c] Deterioration of metals, and other materials beyond normal weathering.
- [d] Water penetration through fixed glazing and framing areas.
- [e] Failure of operating components.

[2] Warranty Period: 2 years from date of Substantial Completion.

- b) Special Finish Warranty: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

[1] Deterioration includes, but is not limited to, the following:

- [a] Color fading more than 5 Hunter units when tested according to ASTM D 2244.
- [b] Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.

[c] Cracking, checking, peeling, or failure of paint to adhere to bare metal.

[2] Warranty Period: 2 years from date of Substantial Completion.

B. Glass Warranty: As specified in Section 08 81 00.

2. PART 2 - PRODUCTS

2.1 ALUMINUM-FRAMED STOREFRONTS (EXTERIOR)

A. Manufacturers:

- 1) Kawneer North America; Trifab VG 451T Framing. Basis of Design.
- 2) EFCO Corp.; System 433 Triple Set Framing.
- 3) Vistawall; 3000 Multiplane Framing.
- 4) Tubelite; 14000 I/O Series Framing.

B. Product Description:

- 1) Frames: 2 x 4-1/2 inch nominal dimension; thermally broken with interior tubular section insulated from exterior; flush glazing stops; drainage holes; internal weep drainage system.
- 2) Glazing Location in Framing: Front set, match curtain walls.
- 3) Mullions: Profile of extruded aluminum with internal reinforcement of aluminum or shaped steel structural section.

2.2 ALUMINUM-FRAMED STOREFRONTS (INTERIOR)

A. Manufacturers:

- 1) Kawneer North America; Trifab VG 451T Framing. Basis of Design.
- 2) EFCO Corp.; System 402.
- 3) Vistawall; FG-3000.
- 4) Tubelite; 14000 Series Framing.

B. Product Description:

- 1) Frames: 2 x 4 1/2 inch nominal dimension; thermally broken with interior tubular section; flush glazing stops.

- 2) Glazing Location in Framing: Center set.
- 3) Mullions: Profile of extruded aluminum with internal reinforcement of aluminum or shaped steel structural section

2.3 COMPONENTS

- A. Extruded Aluminum: ASTM B221; 6063 alloy, T5 temper typical, 6061 alloy, T6 temper for extruded structural members.
- B. Sheet Aluminum: ASTM B209, 5005 alloy, H15 or H34 temper.
- C. Sheet Steel: ASTM A653/A653M; galvanized to minimum G90.
- D. Steel Sections: ASTM A36/A36M; shaped to suit mullion sections, galvanized to G90.
- E. Glass: Specified in Section 088100.
- F. Glazing Materials: Storefront manufacturer's standard types to suit application and to achieve weather, moisture, and air infiltration requirements.
- G. Flashings: Minimum 0.032 inch thick aluminum.
- H. Air Barriers: Specified in Section 072100.
- I. Sealant and Backing Materials:
 - 1) Sealant Used within System (Not Used for Glazing): Manufacturer's standard materials to achieve weather, moisture, and air infiltration requirements.
 - 2) Perimeter Sealant: Specified in Section 079200.
- J. Fasteners: Stainless or Hot-dip galvanized steel.
- K. Note: Storefront manufacturer to provide all interior and exterior break metal covers and mullion extensions to match adjacent storefront finish.
- L. Note: Storefront manufacturer to provide all fasteners, clips, and all other pieces necessary for a complete assembly.

2.4 FABRICATION

- A. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- B. Break form cladding to match framing profiles. Fabricate cladding to align flush with adjacent cladding.

- C. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.
- D. Prepare components to receive anchor devices. Fabricate anchors.
- E. Arrange fasteners and attachments to conceal from view.
- F. Reinforce interior horizontal head rail, where indicated to receive drapery or blind track brackets and attachments.
- G. Prepare components with internal reinforcement for door hardware.
- H. Reinforce framing members for imposed loads.

2.5 SHOP FINISHING

- A. Finish to be clear anodized aluminum finish.
- B. Concealed Steel Items: Galvanized in accordance with ASTM A123 to thickness Grade 85, 2.0 oz/sq ft.
- C. Apply bituminous paint to concealed aluminum and steel surfaces in contact with cementitious or dissimilar metals.

3. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other Work.
- B. Verify wall openings and adjoining air and vapor seal materials are ready to receive Work of this Section.

3.2 INSTALLATION

- A. Install wall system in accordance with AAMA - Metal Curtain Wall, Window, Store Front and Entrance - Guide Specifications Manual.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide alignment attachments and shims to permanently fasten system to building structure.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.

- F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam.
- G. Coordinate attachment and seal of perimeter air and vapor barrier materials.
- H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.
- I. Install cladding with hair line joints. Seal joints watertight. Completely cover surfaces of framing so no aluminum is visible in finished construction.
- J. Install integral flashings and integral joint sealers.
- K. Set thresholds in bed of mastic and secure.
- L. Install hardware using templates provided. Refer to Section 087100 for installation requirements.
- M. Coordinate installation of glass with Section 08 81 00; separate glass from metal surfaces.
- N. Seal perimeter joints in accordance with Section 079200.

3.3 ERECTION TOLERANCES

- A. Maximum Variation from Plumb: 0.06 inches every 3 ft non-cumulative or 1/16 inches per 10 ft, whichever is less.
- B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

3.4 ADJUSTING

- A. Adjust operating hardware for smooth operation.

3.5 CLEANING

- A. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- B. Remove excess sealant by method acceptable to sealant manufacturer.

3.6 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect finished Work from damage.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Furnish and install aluminum architectural windows and all related components as shown on drawings and specified in this section.

1.2 TESTING AND PERFORMANCE REQUIREMENTS

A. Test Units

- 1) Air, water, and structural test unit minimum size 5'-2-5/16" x 8'-0", shall conform to requirements set forth in latest edition of ANSI/AAMA 101.

B. Test Procedures and Performances

- 1) All windows shall conform to latest edition of ANSI/AAMA 101 requirements for referenced window type in section 1.5. The following specific performance requirements shall be met:
 - a) Air Infiltration Test
 - b) Water Resistance Test
 - c) Uniform Load Structural Test
 - d) Condensation Resistance Test (CRF)
 - e) Thermal Transmittance Test

1.3 QUALITY ASSURANCE

- A. Provide test reports from AAMA accredited laboratory certifying the performance as specified in Section 1.2.
- B. Test reports shall be accompanied by the window manufacturer's letter of certification stating that the tested window meets or exceeds the aforementioned criteria for the appropriate ANSI/AAMA 101 latest edition window type.
- C. Where required, windows shall bear ANSI/AAMA certification labels of conformance.

1.4 SUBMITTALS

- A. Contractor or window manufacturer shall submit shop drawings, finish samples, test reports and warranties, per requirements of Architect.
 - 1) Samples of materials may be requested without cost to Owner, i.e. frame sections, corner samples, mullions, extrusions, anchors, and glass.
 - 2) VOC data:

a) Adhesives for site installation and factory fabrication:

- [1] Submit manufacturer's product data for adhesives. Indicate VOC limits of the product. Submit MSDS highlighting VOC limits.

1.5 MANUFACTURERS

A. Acceptable Manufacturers:

- 1) Winco Windows are base specification. Capitol Aluminum 325SS series windows, Manko Window System Series #3527, Wausau 3250 series visuline, EFCO modle 810I, and Traco Windows TR451, and Litex architectural windows meeting or exceeding this specification are also approved.

B. Awning windows:

- 1) Basis of design: Winco 3350, 3 ½" thermally broken aluminum projected (awning) window with 1" insulated glass.
- 2) Approved equals: Capitol Aluminum 325SS series windows, Manko Window System Series #3527, Wausau 3250 series visuline, EFCO modle 810I, and Traco Windows TR451.

C. Double hung window:

- 1) Basis of design: Winco 4500S, 4" thermally broken aluminum double hung window with 1" insulated glass.
- 2) Approved equals by: Capital Aluminum, Manko Window Systems, Wausau, EFCO and Traco

D. All windows shall have structural polyurethane thermal breaks. Non-structural thermal barriers are not acceptable.

1.6 WARRANTIES

A. Window System

- 1) Manufacturer shall warrant all aluminum windows for a period of five years against workmanship and defects, after final inspection.

2. PART 2 - PRODUCTS

2.1 MATERIALS

A. Aluminum

- 1) Extruded aluminum shall be 6-63-TS or 6063-T6 alloy and tempered, with a tensile strength of 24,000 PSI.

B. Glass

- 1) Exterior glazing for windows on the east, south, and west elevations shall be tinted gray glass. Interior glazing shall be clear.
- 2) Glass is to be ¼" on both in board, and 1" insulated double pain on the out board lites for a total of three pains of glass. See section 08 81 00 for description of glass.

2.2 FABRICATION

A. General

- 1) All aluminum frame and vent extrusions shall have a minimum wall thickness of .125".
- 2) Depth of main frame shall not be less than 3 1/2" for Winco Windows. Depth of main frame shall not be less than 3¼" for Capitol and Wausau Windows.

B. Frame

- 1) Frame components shall be assembled by means of triple screws, and chemically welded.

C. GLAZING

- 1) All units shall be glazed with pre-shim tape, silicone cap bead on both interior and exterior, and extruded snap-in aluminum glazing bead.

D. FINISH

- 1) Finish all exposed areas of aluminum windows and components with electrolytically deposited color in accordance with Aluminum Association.
- 2) Color to be dark bronze anodized, submit color sample to Architect for approval.

3. PART 3 - EXECUTION

3.1 INSPECTION

A. Job Conditions

- 1) Verify that openings are dimensionally correct and within allowable tolerances. Openings must be plumb, level, and clean. Provide a solid anchoring surface that is in accordance with approved shop drawings.

3.2 INSTALLATION

- A. Use only skilled craftsmen for work to be done in accordance with approved shop drawings and specifications.
- B. Adjust windows for proper ease of operation after installation has been completed.
- C. Contractor furnish and apply sealant to provide a weathertight installation at all opening perimeters. Wipe off excess material and leave all exposed surfaces and joints clean and smooth.

3.3 ADJUSTING AND CLEANING

- A. After completion of window installation windows shall be inspected, adjusted, and left in working order. Windows shall be left clean, free of labels, dirt, etc. Protection from this point shall be the responsibility of the building occupant.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

- A. Drawings and general provisions of the Contract, including Instructions to Bidders, General and Supplementary Conditions and Division 1 Specification Sections, apply to the Work of this Section.
- B. Aluminum framed storefronts. See specification section 08 41 13 Aluminum Framed Storefronts.

1.2 SUMMARY

- A. Section includes:
 - 1) Aluminum-framed self-closing service window to be installed in storefront system frame "C".

1.3 SYSTEM DESCRIPTION

- A. Aluminum-framed service window system includes tubular aluminum framing, horizontal sliding self-closing service window, shop fabricated, factory finished, glass and glazing, related flashings, anchorage and attachment devices.
- B. System Assembly: Premanufactured unit installed onsite in aluminum storefront system.
- C. System should match finish of aluminum storefront system, aluminum windows, and aluminum door frames.

1.4 SUBMITTALS

- A. Shop Drawings:
 - 1) Shop drawings illustrating product, product installation and relationship to adjacent construction.
- B. Samples:
 - 1) Submit color chips for color selection by architect.

1.5 QUALIFICATIONS

- A. Manufacturer and Installer: Company specializing in manufacturing service windows with minimum five years documented experience.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Install sealants and glazing material when ambient temperatures over a 48 hour period after installation are within manufacturer's requirements.

1.7 COORDINATION

- A. Coordinate the Work with installation of store front system.

1.8 WARRANTY

- A. Manufacturer's one year warranty against defects in materials and workmanship.

2. PART 2 - PRODUCTS

2.1 ALUMINUM-FRAMED SELF-CLOSING SERVICE WINDOW

A. Manufacturers:

- 1) Basis of Desing: QuikServ Inc. 11441 Brittmoore Park Drive, Houston, TX 77041, Toll-Free: 800-388-8307, Tel: 713-849-5882, Fax: 713-849-5708, www.quikserv.com, email: sales@quikserv.com.EFCO Corp.; System 433 Triple Set Framing.
- 2) Equals by CRL and Ready Access.

B. Product Description:

- 1) Model 4040. 48" wide by 48" high aluminum framed self-closing service window. Top hung with no bottom track. Slides to be stainless steel slide rail, ball bearing type. Frame depth 4 ½".

2.2 COMPONENTS

A. Stainless steel shelf.

B. Low E insulated glass unit, factory assembled, conforming to ASTM E2190.

- 1) Outer lite: 5/32" clear fully tempered tinted glass.
- 2) Interstitial space 6/15" argon filled.
- 3) Inner lite 5/32" clear fully tempered low e glass.

C. Hardware.

- 1) Latch: Manufacturer's standard spring latch with manual pull and thumb release which automatically locks on closing.
- 2) Nigh security lock bar.

2.3 FINISH

- A. Finish to be clear anodized aluminum finish to match adjacent storefront system.

3. PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify dimensions, tolerances, and method of attachment with other Work.

3.2 INSTALLATION

- A. Install in accordance with manufactures instructions, aluminum storefront manufacturer's requirements and approved shop drawings.
- B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.
- C. Provide receptor system is required.
- D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent Work.
- E. Provide thermal isolation where components penetrate or disrupt building insulation.
- F. Install sill flashings. Turn up ends and edges; seal to adjacent Work to form water tight dam.
- G. Install integral flashings and integral joint sealers.
- H. Set thresholds in bed of mastic and secure.
- I. Seal perimeter joints in accordance with Section 079200.

3.3 CLEANING

- A. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- B. Remove excess sealant by method acceptable to sealant manufacturer.

3.4 PROTECTION OF INSTALLED CONSTRUCTION

- A. Protect finished Work from damage.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hinges, pivots, sliding and folding door hardware, and other hanging hardware; locks, exit devices, cylinders and other latching hardware; closers, holders, self-closing hinges and other controlling hardware; and push plates, pulls, kickplates, and other door trim.

1.2 RELATED WORK

- A. Hollow Metal Frames – Section 08 11 13
- B. Aluminum Doors and Frames – Section 08 11 16
- C. Wood Doors – Section 08 14 00

1.3 QUALITY ASSURANCE

- A. The hardware number and manufacturer's list in the following specifications, and in the hardware schedule, indicate the design, quality and minimum weight acceptable.
- B. Any desired deviations from the List of Acceptable Manufacturers shall be submitted to the Architect for approval ten (10) days prior to the opening bid date, complete with supporting specifications data or physical samples as requested.
- C. Hardware for Fire Rated Openings: NFPA 80, and local requirements.
- D. Handicapped Accessibility: ANSI A117.1, and local requirements.
- E. Materials and Application: ANSI A156 series standards.

1.4 SUBMITTALS

- A. Door Hardware Schedule shall be submitted in the same manner as specified for Shop Drawings. Based on door hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
 - 1) Type, style, function, size and finish of each hardware item
 - 2) Name and manufacturer of each item
 - 3) Fastenings and other pertinent information
 - 4) Location of hardware set cross-referenced to Project Drawings, both on floor plans and on Door and Frame Schedule

- 5) Explanation of all abbreviations, symbols, codes, etc. contained in schedule
- 6) Mounting locations for hardware
- 7) Door and frame sizes and materials
- 8) Include location of manufacture of door hardware.

1.5 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Each item of hardware shall be wrapped and packaged to avoid scratching or marking of the finishes. Mark each item of hardware being delivered to the job site to indicate door opening, as required, to assure installation at correct opening.

2. PART 2 - PRODUCTS

2.1 DOOR HARDWARE

- A. Quality Level: Grade 1, ANSI/BHMA A156.
- B. Locksets and Latchsets: cylindrical on all new doors to match existing.
 - 1) General: The quality of each cylindrical lock set assembly, including cylinder and escutcheon, must be "Grade I" for both "Operation" and "Security" in accordance with ANSI A156.13.
 - 2) Unless required to match existing hardware locations or noted on drawing, center of knob will be approximately 38 inches above finish floor.
 - 3) Provide curved lip strike plate with tongue of appropriate length for type of door trim used.
 - 4) Thickness of the metal for local trim where indicated as cold forged shall be a minimum of .080" thickness. Where wrought trim is listed, thickness of metal shall be .050", both shall be exclusive of the inner knob reinforcements.
- C. Lock Cylinders:
 - 1) All cylinders shall be a minimum of six (6) pin (Schlage) and shall be masterkeyed or grand-masterkeyed as directed by the Architect and Owner to match the current keying system.
- D. Keying
 - 1) Each lockset shall be furnished with four (4) keys. Locks to be keyed to change key, department sub-masters, building master, and grand master, unless directed otherwise.

- 2) Cylinders to be set to construction master key which shall be voided by hardware supplier when directed by Architect. Test all permanent keys to insure proper operation and location.

E. Hinges and Butts

- 1) General: Hinge locations shall conform to the National Builders Hardware Association Standards. No pivot hinges because they are too close to the ground and collect dirt and salt. Hinges shall be as follows:
 - a) 1-1/2 Pair, Full Mortise 4-1/2" x 4-1/2" ball bearing, standard weight, Butt hinges with non-rising removable pins:
 - [1] "McKinney"
 - [2] "Hager"
 - [3] "Select Hinges"
 - [4] or approved equal

F. Closers, Door Control, and Exit Devices

- 1) Grade 1 devices.
- 2) Surface Closers shall be of type listed in schedule and sized in accordance with manufacturers recommended size chart.
 - a) Case to be non-porous cast iron.
 - b) Covers to be non-ferrous minimum .050" thickness finish as listed.
 - c) Arms to be of forged steel and plated to match cover, hold open or fuse link as listed.
 - d) Separate key control valve adjustments for closing speed. Latching cycle and back check (delayed action control as listed)
 - e) Spring adjustment 50% minimum in all sized listed.
 - f) All closers to be mounted on interior of building. Brackets for regular or inverted mountings as listed and allow door to open maximum swing.
 - g) All mountings shall be parallel arm.

G. Push/Pull Units: Through bolted type.

H. Hardware Finishes

- 1) Unless noted elsewhere, finish of hardware shall have finish best matching the selected finish series.

2.2 AUXILIARY MATERIALS

A. Door Trim Units: Kick plates

- 1) Kick plates shall be heights as indicated in the schedule, length shall be two (2) inches less than door width and shall be minimum weight 16 gauge, .050" thickness with edges eased.

B. Stops

- 1) Door stops shall be provided as indicated in the schedule, in general use wall type with concealed fastenings. All stops shall have correct anchoring devices for the material to which they are attached.

C. Weatherstripping and thresholds.

- 1) Thresholds shall be provided at all exterior openings and shall be similar or equal to Durable model number specified.
- 2) All exterior frames shall be provided with adjustable weather strip, for jambs and head.
- 3) Provide door bottom seals at all exterior openings, using A.D.A. accessible thresholds.

D. Key Fob

- 1) All key fob and power supply (example – 12 or 24 volt) to be provided outside of contract by owner's security contractor. See electrical drawings for further information on power / data that is to be installed for support to key fob and power supply.

E. Firemans Key Box

- 1) Provide (1) key lock box total recessed in the wall outside of door 101A or 101B; coordinate final location with architect / local fire department. The box shall be equal to "Knox Box" Model 3275 Black with Recessed Mount. Telephone: 1-800-552-5669. Fax: 714-252-0482

2.3 ACCEPTABLE MANUFACTURERS

ITEM	ACCEPTABLE MANUFACTURER
Butts	McKinney: T4A3786 (4½ X 4½)
	Hager: BB1168
	Stanley: FBB168
Locksets	Dorma: ML 9070 LTA, ML 9040 LTA, ML 9080 LTA, ML 9010 LTA, ML 9050 LTA

	Sargent: Classroom 8237 LNJ, Privacy 8265 LNJ, Storeroom 8204 LNJ, Passage 8215 LNJ, Office 8205 LNJ
	Schlage: L9000 Series 174
Closers	L.C.N.: 1460 PA
	Sargent: EN-351-UO
	Ruswin Corbin: DC 8210-689
	Schlage: SE 71 RWPA
	Norton: CLP9500
Exit Bolts	Ives: FB 457
	Adams Rite: MS 1850 SN , 4015, 4016
	Rockwood: 555 12"
Stops	Burns Mfg.: 570
	Nes Glynn Johnson: 408
	Rockwood: 409
Overhead Stops	Rockwood 414S Nes Guyn Johnson 530
Thresholds	National Guard: 425
	Reese: S104A
	Pemko: 171A
Weather Stripping	National Guard: 155 VA
	Reese: 128 CV
	Zero Pemko: 297 PK-PG
Kick Plate	Rockwood
Sweep	National Guard: 102 VA
	Reese: 362C
	Pemko: 307V, 321N
Sound Seal	National Guard: 107N
	Pemko: 379C
Continuous Hinge	Select Hinges: SL24HD 83"
	Roton/Hager: 780 112HD
	McKinney Hinge: MCK12HD 83 Clear
Panic Device	Von Duprin: 99 series
	Sargent: WD 8600 Series
	Dor-o-Matic: 1690 Series

Auto-Equalizer Power Operated/Assist Door Openers	L.C.N.: Auto Equalizer 4640 Series
	Sargent: Low Energy Door Opener 2600

2.5 HARDWARE SCHEDULE

- A. Corbin Russwin Lockset ML2000 is an approved manufacturer as long as they abide by all specifications and project requirements.
- B. Corbin Russwin Exit Device ED5200 is an approved manufacturer as long as they abide by all specifications and project requirements.

HARDWARE SET #1

Doors: 101A, 101B, 104A, 116A

1 – Continuous Hinge SL-11	AL	Select
1 – Combination Lock CO-100-CY-70-KP-RHO-P6 (Door 116A Only)	26D	Schlage
1 – Combination Lock CO-200-CY-70-KP-RHO-P6	26D	Schlage
1 – Door Closer 4111 S-CUSH	AL	LCN
1 – Threshold 425	AL	National Guard
1 – Set of Weatherstrip by Frame Supplier		
1 – Sweep 102VA	AL	National Guard

HARDWARE SET #2

Door: 101C

3 – Hinges TA2714 4 ½" x 4 ½" NRP	26D	McKinney
1 – Classroom Lock ND70PD x Rhodes	26D	Schlage
1 – Door Closer 4040XP	AL	LCN
1 – Threshold 425	AL	National Guard
1 – Set of Weatherstrip 160S	AL	National Guard
1 – Sweep 102VA	AL	National Guard

HARDWARE SET #3

Doors: 101D, 104C

All Hardware by Others

HARDWARE SET #4

Doors: 102A, 112A

6 – Hinges T4A3786 4 ½" x 4 ½" NRP	26D	McKinney
1 – Storeroom Lock ND80PD x Rhodes	26D	Schlage
2 – Flush Bolts #555-12"	26D	Rockwood
1 – Threshold 425	AL	National Guard
1 – Set of Weatherstrip 160S	AL	National Guard
2 – Sweeps 102VA	AL	National Guard
2 – Automatic Door Holder with Stop #494	26D	Rockwood

HARDWARE SET #5

Doors: 103A, 104B, 105A, 110A, 111A, 113A, 117A, 118A, 119A, 201B

3 – Hinges TA2714 4 ½" x 4 ½" NRP	26D	McKinney
1 – Classroom Lock ND70PD x Rhodes	26D	Schlage
1 – Wall Stop #409	32D	Rockwood

HARDWARE SET #6

Door: 103B

3 – Hinges TA2714 4 ½" x 4 ½"	26D	McKinney
1 – Classroom Lock ND70PD x Rhodes	26D	Schlage
1 – Concealed Overhead Stop 100S	32D	Glynn Johnson

HARDWARE SET #7

Doors: 106A, 108A, 109A

3 – Hinges TA2714 4 ½" x 4 ½"	26D	McKinney
1 – Privacy Set with Indicator ND40 OS-OCC x Rhodes	26D	Schlage
1 – Wall Stop #409	32D	Rockwood

HARDWARE SET #8

Door: 116B

3 – Hinges TA2714 4 ½" x 4 ½"	26D	McKinney
1 – Combination Lock CO-100-CY-70-KP-RHO-P6	26D	Schlage
1 – Door Closer 4040XP	AL	LCN

HARDWARE SET #9

Door: 201A

3 – Hinges TA2714 4 ½" x 4 ½"	26D	McKinney
1 – Storeroom Lock ND80PD x Rhodes	26D	Schlage
1 – Wall Stop #409	32D	Rockwood

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Install all new hardware in compliance with the manufacturer's recommendations and as noted on Door Schedule and specified herein. Mortised items will be adjusted to fit flush. Do not install surface mounted items until finishes have been completed on the substrates involved. Lubricate and adjust all hardware to operate properly.
- B. Verify keying with Architect and Owner prior to setting cylinders and fabricating keys.
- C. Adjust weather stripping and hardware as required for proper operation.
- D. Adjust hardware as required for proper operation.
- E. At completion of work clean all hardware.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Transparent glass for general and special purpose applications.

1.2 WORK SPECIFIED ELSEWHERE

- A. Hollow Metal Frames - Section 08 11 13
- B. Aluminum Doors & Frames - Section 08 11 16
- C. Wood Doors - Section 08 14 00
- D. Glazing Accessories - Section 08 85 00

1.3 Submittals

- A. Provide shop drawings
 - 1) Submit manufacturer's or fabricator's shop drawings, including plans, elevations, sections, and details, indicating glass dimensions, tolerances, types, thicknesses, and coatings.
- B. Product Data
 - 1) Submit manufacturer's product data, including performance characteristics and installation instructions.
 - 2) Submit manufacturer's standard warranty for sealed insulating glass units.

1.4 QUALITY ASSURANCE

- A. Comply with applicable codes and regulations and with the Consumer Product Safety Commission CPSC 16 CFR 1201 and with applicable recommendations of Flat Glass Marketing Association (FGMA) "Glazing Manual."
- B. Label showing strength, grade, thickness, type and quality will be required on each piece of glass. Labels must remain on glass until it has been set and inspected. In addition to manufacturer's labels, wire glass must comply with requirements of Underwriters' Laboratories, Inc. When glass is not cut to size by the manufacturer and is furnished unlabeled from lock stock, the contractor must submit an affidavit stating the quality, thickness, type and manufacturer of glass furnished.
- C. Energy Performance
 - 1) Glazing shall combine with framing to achieve rating per NFRC.

1.5 GUARANTEE

- A. The manufacturer of the insulating glass units shall submit three (3) copies of a ten year guarantee stating that under normal conditions the units will not develop material obstruction of vision as a result of dust or film formation on the internal glass surfaces caused by failure to the hermetic seal other than through glass breakage.

1.6 DEFINITIONS

- A. Sealed Insulating Glass Unit Surfaces:
 - 1) Surface No. 1 Exterior surface of outer lite.
 - 2) Surface No. 2 Interior surface of outer lite.
 - 3) Surface No. 3 Exterior surface of inner lite.
 - 4) Surface No, 4 Interior surface of inner lite.
- B. Airspace: Space between lites of an insulating glass unit that contains dehydrated air or other inert specified gas.

1.7 MANUFACTURERS

- A. Material equal to that specified below and manufactured by Guardian Industries Corp., 14600 Romine Road, Carleton, Michigan 48117. Toll Free (800) 521-9040. Phone (734) 654-6264. Fax (734) 654-0935. Web Sites [www. Guardian.com](http://www.Guardian.com), www.sunguardglass.com. Or Libbey-Owens-Ford Glass Co. or P.P.G. Industries, or A.S.G. Industries, or Mississippi Plate Glass Company, will be accepted as equal.

2. PART 2 - PRODUCTS

2.1 GLASS

- A. Sealed Insulating Glass
 - 1) Double-Glazed Sputter-Coated Insulating Glass Units: ASTM E 2190, Class CBA
 - a) Outboard Lite: Sputter-coated CrystalGray® Float Glass:
 - [1] Annealed CrystalGray® Gloat Glass: ASTM C 1036, Type 1, Class 2, Quality q3.
 - [2] Vacuum Deposition Sputtered Coating: ASTM C 1376.
 - [3] Coating on Surface No. 2: SunGuard SuperNeutral 68 (SN 68).

- [4] Glass Thickness: 6 mm (1/4 inch).
 - [5] Heat Treatment: Heat-strengthened, ASTM C 1048, Kind HS and for windows and Tempered; ASTM C 1048 for door and door frame glazing..
- b) Air Space: 12 mm (1/2 inch) wide, hermetically sealed, dehydrated air space.
- c) Inboard Lite: Clear float glass.
 - [1] Annealed Glear Float Glass: ASTM C 1036, Type 1, Class 1, Quality q3.
 - [2] Glass Thickness: 6 mm (1/4 inch)
 - [3] Heat-Treatment: Tempered; ASTM C 1048 for door and door frame glazing only.
- d) Glass Unit Performance Characteristics:
 - [1] Visible Light Transmittance: 49 percent
 - [2] Visible Light Reflectance Outdoors: 8 percent
 - [3] Direct Solar Energy Transmittance: 24 percent
 - [4] Direct Solar Energy Reflectance Outdoors: 16 percent
 - [5] Winter U-Value Nighttime: 0.29
 - [6] Summer U-value Daytime 0.28
 - [7] Shading Coefficient: 0.34
 - [8] Solar Heat Gain Coefficient: 0.30
 - [9] Summer Relative Heat Gain: 72
- e) Edge Seals: ASTM E 773, with aluminum spacers and silicone sealant for glass-to-spacer seals.
- f) Sealant: Approved by glass manufacturer.
- g) Application: Glazing to be used in the following areas:
 - [1] For all exterior door glazing and exterior door frame glazing.

[2] Note: Insulating glass to be tempered where used in doors and door frames and as required by storefront and window manufacturers.

B. Heat Treated Glass Products: Tempered glass, ASTM C 1048. (Alternate 6)

- 1) Tempered Glass – 1/4" Tempered Plate/Float clear.
 - a) Application for all inner vestibule doors, and interior non-fire rated doors and windows.
- 2) Tempered Glass – 1" insulated dual glazing - Tempered Plate/Float clear.
 - a) Application for all exterior vestibule doors and all interior non-fire rated doors and windows as noted on drawings.

C. Window film:

- 1) Windows in room 116 shall receive window tinting. See section 08 87 16.
- 2) Upper portion of window "C" in room 101 shall receive sun control window film. See section 08 87 16.
- 3) Entrance door system frame "C" shall receive etched window film. See section 08 87 16.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Work shall be in accordance with glass manufacturers recommendation.
- B. Do not set glass until reveals have been primed and priming is dry.
- C. Protections – Protect glass from breakage. Any glass broken, chipped, abraded or cracked by the contractor, shall be removed and replaced prior to completion.
- D. Cleaning – Wash glass on both faces, not more than 4 days prior to date scheduled for inspection for completion. Wash glass by method recommended by the glass manufacturer. Remove all labels from glass surface. Do not use harsh cleaning materials or methods that would damage glass.
- E. Preparation
 - 1) Verify glazing openings are correct size and within tolerance. Verify glazing channels, recesses, and weeps are clean and free of obstructions.

◆ END OF SECTION ◆

SECTION 08 85 00
GLAZING ACCESSORIES

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Glazing compounds, setting blocks, shims, tape, splines, clips, and other accessories.
- B. Finish contractor shall provide all glazing accessories required for glazing work under their contract. See Section 08 81 00.

1.2 WORK SPECIFIED ELSEWHERE

- A. Hollow Metal Frames - Section 08 11 13
- B. Aluminum Doors & Frames - Section 08 11 16
- C. Wood Doors - Section 08 14 00
- D. Glass Glazing - Section 08 81 00

1.3 SUBMITTALS

- A. Provide manufactures information

1.4 MANUFACTURERS

- A. Tremco Manufacturing Co., Pecora Corporation, Dow Corning or approved equal.

2. PART 2 - PRODUCTS

2.1 GLAZING SEALANTS

- A. General
 - 1) Provide materials as recommended by the manufacturer for the required application and condition of installation in each case. Provide only compounds which are proven to be fully compatible with surfaces contacted.
- B. Silicone Rubber Glazing Sealant: Shall be silicone rubber, one part elastomeric sealant complying with FS TT-S-001543, Class A. Provide acid type for nonporous channel surfaces and provide nonacid medium-modulus type for porous channel surfaces.
- C. Preformed Butyl Rubber Glazing Sealant: Shall be tape or ribbon (coiled on release paper) of polymerized butyl or mixture of butyl and polyisobutylene, compounded with inert fillers and pigments, solvent-based with minimum of 95 percent solids with thread or fabric reinforcement, tack-free within 24 hours, paintable, nonstaining.

- 1) Provide combination tape and encased continuous rubber shim of approximately 50 durometer hardness.
- D. Two Component Polysulfide Glazing Sealant: Shall be polysulfide 2-part elastomeric sealant, complying with FS TT-S-00227, Class A, Type 2 (nonsag). Material shall be compounded by manufacturer specifically for glazing.

2.2 GLAZING GASKETS

- A. Polyvinyl Chloride Glazing Gaskets: Shall be extruded, flexible PVC gaskets of the profile and hardness shown or as required for watertight construction, complying with ASTM D2287.
- B. Structural Rubber Glazing Gaskets: Shall be neoprene extrusions with injection molded corner units, fabricated into frames with either integral or separate locking strips (zippers), complying with ASTM C542, black.

2.3 MISCELLANEOUS GLAZING MATERIALS

- A. Setting Blocks: Shall be neoprene, 70-90 durometer hardness with proven compatibility with sealants used.
- B. Spacers: Shall be neoprene, 40-50 durometer hardness with proven compatibility with sealants used.
- C. Compressible Filler Rod: Shall be closed-cell or waterproof jacketed rodstock of synthetic rubber or plastic foam with proven compatibility with sealants used. Rod shall be flexible and resilient with 5-10 PSI compression strength for 25 percent deflection.
- D. Cleaners, Primers, and Sealers: Shall be products as recommended by sealant or gasket manufacturer.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Glazing compounds and tapes shall be installed in strict accordance with the manufacturer's written instructions or directions.
- B. All glass shall be bedded, face puttied, secured in place - except where face glazing beads are required shall be back puttied. Apply putty uniformly, remove excess putty from glass. Secure glass in doors and interior sash with glazing beads bedded in glazing compound.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Opaque window film for lower windows in room 116.
- B. Mirrored window film for upper portion of window "C" in room 101.
- C. Etched window film for exterior door glazing #101A & #101B.
 - 1) See detail A800.5/A800.6

1.2 WORK SPECIFIED ELSEWHERE

- A. Aluminum Doors & Frames - Section 08 11 16
- B. Aluminum Storefronts 08 41 13
- C. Aluminum Windows - Section 08 51 13
- D. Glazing Accessories - Section 08 85 00

1.3 REFERENCES

- A. ASTM International (ASTM):
 - 1) ASTM E84 - Standard Method of Test for Surface Burning Characteristics of Building Materials.
 - 2) ASTM E903 - Standard Methods of Test for Solar Absorbance, Reflectance and Transmittance of Materials Using Integrating Spheres.
- B. Performance:
 - 1) Thickness: 2 mil (minimum).
- C. Adhesion to Glass:
 - 1) Minimum 6 lbs/in peel strength per ASTM D3330 (Method A).
- D. Flammability: Surface burning characteristics when tested in accordance ASTM E 84, demonstrating film applied to glass rated Class A for Interior Use:
 - 1) Flame Spread Index: no greater than 25.
 - 2) Smoke Developed Index: no greater than 55.
- E. Abrasion Resistance:
 - 1) Film shall have a surface coating that is resistant to abrasion such that less than 3 percent increase of transmitted light haze will result when tested in accordance to ASTM D 1044 using 100 cycles, 500 grams

weight, and the CS10F Calibrase Wheel.

1.4 Submittals

A. Provide shop drawings

- 1) Submit manufacturer's or fabricator's shop drawings, including plans, elevations, sections, and details, indicating glass dimensions, tolerances, types, thicknesses, and coatings.

B. Product Data: Manufacturer's current technical literature on each product to be used, including:

- 1) Manufacturer's Data Sheets.
- 2) Preparation instructions and recommendations.
- 3) Storage and handling requirements and recommendations.
- 4) Installation methods.

C. 3rd Party Test Report Submittal Requirements. Submit the following 3rd Party test reports indicating compliance with the test values listed in this section.

- 1) Flammability Testing, ASTM E84.
- 2) Film Properties Testing, ASTM D882.
- 3) Peel Strength Testing, ASTM D3330.

D. Verification Samples: For each film specified, two samples representing actual film color and pattern.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: All primary products specified in this section will be supplied by a single manufacturer with a minimum of ten years experience.

B. Installer Qualifications: All products listed in this section are to be installed by a single installer with a minimum of five years demonstrated experience in installing products of the same type and scope as specified.

- 1) Provide documentation that the installer is authorized by the Manufacturer to perform Work specified in this section.
- 2) Provide a commercial building reference list of 5 properties where the installer has applied window film. This list will include the following information:
 - a) Name of building.
 - b) The name and telephone number of a management contact.
 - c) Type of glass.
 - d) Type of film and/or film attachment system.

- e) Amount of film and/or film attachment system installed.
- f) Date of completion.

- C. Mock-Up: Provide a mock-up for evaluation of surface preparation techniques and application workmanship.
 - 1) Finish areas designated by Architect.
 - 2) Do not proceed with remaining work until workmanship, color, and sheen are approved by Architect.
 - 3) Refinish mock-up area as required to produce acceptable work.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Follow Manufacturer's instructions for storage and handling.
- B. Store products in manufacturer's unopened packaging until ready for installation.
- C. Store and dispose of any hazardous materials, and materials contaminated by hazardous materials, in accordance with requirements of local authorities having jurisdiction.

1.7 PROJECT CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

- A. At project closeout, provide to Owner's Representative an executed current copy of the manufacturer's standard limited warranty against manufacturing defect, outlining its terms, conditions, and exclusions from coverage.
- B. In order to validate warranty, installation must be performed by an Authorized manufacturer dealer. Verification of Authorized manufacturer dealer can be confirmed by submission of active manufacturer dealer code number.

2. PART 2 - PRODUCTS

2.1 MANUFACTURERS – Sun Control: Basis of Design, 3M Commercial Solutions 3M sun control window film

- A. Acceptable Manufacturers:
 - 1) 3M Commercial Solutions; St. Paul, MN 55144-1000; Tel: 888-650-3497; Tel: 651-737-1081; Fax: 651 737 8241; Email: [request info \(3mredinsidesales@mmm.com\)](mailto:requestinfo@3mredinsidesales@mmm.com);
 - 2) Madico Commercial and Residential Solar Control and Safety Films – SafetyShield Window Film; Pinellas Park, FL 33782; Tel: 888-887-2022;

Web: www.madico.com, www.safetyshield.com

- 3) DefenseLite – Bulletshield. Tel: 888-689-5502; info@defenselite.com;
Web: defenselite.com

2.2 MANUFACTURERS – Etched Film: Basis of Design, Solyx Glass Finishes, model SXGF-0097 Deep Etch translucent film.

A. Acceptable Manufacturers:

- 1) Solyx Glass Finishes as trademarked by Decorative Films, LLC; 3909 Cornell Place, Frederick, MD 21703; Tel: 1-888-657-5224;
www.decorativefilm.com
- 2) 3M Commercial Solutions; St. Paul, MN 55144-1000; Tel: 888-650-3497;
Tel: 651-737-1081; Fax: 651 737 8241; Email: [\(3mredinsidesales@mmm.com\)](mailto:requestinfo(3mredinsidesales@mmm.com));
- 3) Madico Commercial and Residential Solar Control and Safety Films – SafetyShield Window Film; Pinellas Park, FL 33782; Tel: 888-887-2022;
Web: www.madico.com, www.safetyshield.com.

2.3 MANUFACTURERS – Opaque Film: Basis of Design, 3M Commercial Solutions 3M Decorative window film

A. Acceptable Manufacturers:

- 1) 3M Commercial Solutions; St. Paul, MN 55144-1000; Tel: 888-650-3497;
Tel: 651-737-1081; Fax: 651 737 8241; Email: [\(3mredinsidesales@mmm.com\)](mailto:requestinfo(3mredinsidesales@mmm.com));
- 2) Madico Commercial and Residential Solar Control and Safety Films – SafetyShield Window Film; Pinellas Park, FL 33782; Tel: 888-887-2022;
Web: www.madico.com, www.safetyshield.com
- 3) DefenseLite – Bulletshield. Tel: 888-689-5502; info@defenselite.com;
Web: defenselite.com

3. PART 3 - EXECUTION

3.1 EXAMINATION

A. Film Examination:

- 1) If preparation of glass surfaces is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.
- 2) Glass surfaces receiving new film should first be examined to verify that they are free from defects and imperfections, which will affect the final appearance.

- 3) Do not proceed with installation until glass surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- 4) Commencement of installation constitutes acceptance of conditions.

B. Adhesive Examination:

- 1) If application of window film is/was the responsibility of another installer, notification in writing shall be made of deviations from manufacturer's recommended installation tolerances and conditions.
- 2) Filmed glass surfaces receiving new attachment should first be examined to verify that they are free from defects and imperfections, and that the film edges extend sufficiently to the frame edges.
- 3) Do not proceed with installation until film and frame surfaces have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result under the project conditions.
- 4) Conduct an adhesion test to the frame surface may be conducted by applying a 4 - 6 inch long bead, approximately 0.5 - 1 inch in width, masking one side of the frame surface underneath the strip with tape. Allow the Impact Protection Adhesive to cure for 7 days and test adhesion by pulling up on the masked end and a 90 degree angle. If cohesive failure is observed (adhesive residue left behind on the frame surface), adhesion is acceptable; if adhesive failure is observed (clean peel from the frame), adhesion is unacceptable and product is not recommended.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- C. Refer to Manufacturer's installation instructions for methods of preparation for Adhesive or film attachment systems.

3.3 INSTALLATION

A. Film Installation:

- 1) Install in accordance with manufacturer's instructions.
- 2) Cut film edges neatly and square at a uniform distance of 1/8 inch (3 mm) to 1/16 inch (1.5 mm) of window sealant. Use new blade tips after 3 to 4 cuts.
- 3) Spray the slip solution, composed of one capful of baby shampoo or dishwashing liquid to 1 gallon of water, on window glass and adhesive to

facilitate proper positioning of film.

- 4) Apply film to glass and lightly spray film with slip solution.
- 5) Squeegee from top to bottom of window. Spray slip solution to film and squeegee a second time.
- 6) Bump film edge with lint-free towel wrapped around edge of a 5-way tool.
- 7) Upon completion of film application, allow 30 days for moisture from film installation to dry thoroughly, and to allow film to dry flat with no moisture dimples when viewed under normal viewing conditions.

3.4 CLEANING AND PROTECTION

- A. Remove left over material and debris from Work area. Use necessary means to protect film before, during, and after installation.
- B. Touch-up, repair or replace damaged products before Substantial Completion.
- C. After application of film, wash film using common window cleaning solutions, including ammonia solutions, 30 days after application. Do not use abrasive type cleaning agents and bristle brushes to avoid scratching film. Use synthetic sponges or soft cloths.

◆ END OF SECTION ◆

PLASTER AND GYPSUM BOARD ASSEMBLIES

1. PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Shall include application of gypsum drywall panels as indicated on drawings and specified hereinafter.

1.2 QUALITY ASSURANCE

- A. Materials or operations specified by reference to the published specifications of a manufacturer or other published standards shall comply with the requirements of the standards listed.
 - 1) Standards include ASTM C840 and GA216.
- B. Refer to "Recommended Specification on Levels of Gypsum Board Finish" as published by the Gypsum Association (and AWCI/CISCA/PDCA) for finish levels required.
- C. Framing standards shall be in accordance with AISI, Specification for Design of Cold-Framed Steel Structural Members.

1.3 SUBMITTALS

- A. Product data.

1.4 DELIVERY AND STORAGE OF MATERIALS

- A. Deliver materials in original unopened packages and store in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

1.5 ENVIRONMENTAL CONDITIONS

- A. In cold weather and during gypsum panel application and joint finishing, temperatures within the building shall be maintained within the range of 55 degrees to 70 degrees F. Adequate ventilation shall be provided to carry off excess moisture.

1.6 MANUFACTURERS

- A. Materials shall be as manufactured by the National Gypsum Co., USG, Georgia Pacific, or the Flintokote Co., and equal to the following products specified in section 2.1 Gypsum Board.

2. PART 2 - PRODUCTS

2.1 GYPSUM BOARD (ASTM C - 36)

- A. National Gypsum Gold Bond Hi-Impact XP 5/8 high impact and moisture resistant drywall on all walls except those noted as another material. Equals are CertainTeed extreme abuse resistant drywall with MStech and USG Mold Tough VHI firecode X panels.
- B. National Gypsum Gold Bond Fire-Sheild 5/8", type x gypsum board for all ceilings except those noted as another material. Equals by CertainTeed and USG.

2.2 STEEL STUDS & ACCESSORIES

- A. All galvanized 20 and 22 gauge studs, all galvanized track, bridging, end closures and accessories shall be formed from steel that corresponds to the requirements of ASTM C645 with a minimum yield of 33,000 psi.
- B. All galvanized studs, joists, track, bridging and accessories shall be formed from steel having a G-90 galvanized coating meeting the requirements of ASTM A653.
- C. Framing components may be preassembled into panels prior to erecting. Prefabricated panels shall be square, with components attached in a manner as to prevent racking.
- D. All framing components shall be cut squarely for attachment to perpendicular members, or as required for an angular fit against abutting members. Members shall be held positively in place until properly fastened.
- E. Provide insulation equal to that specified elsewhere in all double jamb studs and double header members which will not be accessible to the insulation contractor. See Section 07 21 00.
- F. Prior to installation inspect work of all other trades. Verify that all such work is complete and accurate to the point where this installation may properly commence in strict accordance with framing shop drawings. Immediately notify Architect of all discrepancies.
- G. Erect framing and panels plumb, level and square. Erection tolerance shall be 1/16 inch. Provide permanent bracking of walls for tops of walls, etc.
- H. Handling and lifting of prefabricated panels shall be done in a manner as to not cause distortion in any member.
- I. At track butt joints, abutting pieces of track shall be securely anchored to a common structural element, or they shall be butt-welded or spliced together.
- J. Studs shall be plumbed, aligned and securely attached to the flange or webs of both upper and lower tracks.
- K. Jack studs or cripples shall be installed below window sills, above window and door heads, and elsewhere to furnish support, and shall be securely attached to supporting members.

- L. Wall stud bridging shall be attached in a manner to prevent stud rotation. Bridging rows shall be spaced according to the manufacturer's recommendation. Without supportive data, the minimum bridging shall be 5'0" on center for wind loaded walls and 3'4" on center for walls 10 feet and higher.
- M. Temporary bracing shall be provided until erection is completed.
- N. Studs up to and including 10 feet in height shall be 22 gauge studs over 10 feet in height or supporting ceramic tile finish shall be 20 gauge or as indicated on drawings.
- O. Studs for 5" nominal wall are to be 3-5/8" wide; studs for 7" nominal walls are to be 6" wide.
- P. Blocking shall be 2 x 4 lumber. Provide Blocking for wall hung cabinets and elsewhere as required for mounting equipment to walls. (i.e. grab bars, extinguisher cabinets etc). It is the contractors responsibility to locate and verify the locations of all required blocking.

2.3 STEEL FRAMING FOR FURRED CEILINGS

- A. Channels: Cold rolled steel, 0.0598 inch minimum thickness of base metal and 7/16 inch wide flanges.
 - 1) Carrying Channels: 1-1/2 inches deep, 475 pound per 1000 feet.
 - 2) Furring Channels: 3/4 inch deep, 300 pound per 1000 feet.
 - 3) Finish: ASTM A 525, G90 hot dip galvanized coating.

2.4 FURRING CHANNELS

- A. USG – Furring Channels, Furring Channels (and clips). Furring size as required by installation and as indicated on drawings.

2.5 JOINT TREATMENT

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated. Use moisture resistant compound in all restrooms and wet areas.
- B. Toxicity/IEQ: Lime compound. All purpose joint and texturing compound containing inert fillers and natural binders. Pre-mixed compounds shall be free of antifreeze, vinyl adhesives, preservatives, biocides and other slow releasing compounds.
- C. Reinforcing Tape:
 - 1) Toxicity/IEQ: Sheetrock Joint Tape. Paper; fiberglass joint tape not permitted.

2.6 SOUND ATTENUATION BLANKETS

- A. See section 07 21 00

2.7 FASTENERS

- A. GWB-54 annular ring nails and/or USG screws as recommended.

2.8 TRIM ACCESSORIES

- A. Comply with ASTM C1047
 - 1) Material: Metal trim, steel sheet zinc coated by hot dip or electrolytic process, or steel sheet coated with aluminum or rolled zinc.
 - 2) Types: Cornerbead, edge trim and control joints.
- B. GWB Nos. 103 Corner Bead, 200A J-Trim, 200B L-Trim, 093 Control Joint etc. as required.
- C. Use ¾" metal bullnose drywall bead where shown on drawings. Prefill hollow void of ¾" bullnose corners before applying to wall with Durabond 90 compound.
- D. The use of exposed leg J-shapes is prohibited.

2.9 CAULKING

- A. USG Acoustical Sealant. Caulk along edges of dissimilar materials.

2.10 ACCESS HATCH ACCESSORIES

- A. Acudor DW-5040 Flush access door equals by Karp and Elmdor.
 - 1) 36"x36", 1 latch, concealed hinge, 20 gauge galv. formed door panel, 26 gauge galv. frame, paintable.
 - 2) See drawings for locations.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. The installation shall comply with the following USG Technical Folders:
 - 1) Gypsum Drywall - Steel Frame Folder #SA-923
 - 2) Gypsum Drywall - Wood Frame Folder #SA-924
 - 3) Gypsum Panels & Accessories Folder #SA-927
 - 4) Coatings Folder #SA-933
 - 5) FiberBond Wallboard Louisiana-Pacific Instructions

- B. Conform to industry standard procedures.
- C. Joints shall be taped and spackled to a smooth finish.
- D. Joints between gypsum drywall and other materials shall be comprised of a J-trim with minimum ¼" sealant joint.
- E. Furnish additional blockings between the studs to support all wall mounted furnishings and equipments. i.e. caulk board, tack board, marker board, projection screen.
- F. Provide in partitions all necessary blocking and reinforcing to accept items being attached and/or built-in by other trades.
- G. Install sound blanket in partitions between offices and as called out on floor plans and reflected ceiling plans.
- H. Indoor Air Quality:
 - 1) Temporary ventilation: Provide temporary ventilation for work of this Section.
 - 2) Multi-layer gypsum board: Screw attach. Adhesive attachment will not be permitted.

3.2 NON-LOAD-BEARING STEEL FRAMING INSTALLATION

- A. General: Comply with ASTM C 754, and ASTM C840 requirements that apply to framing installation.
- B. Partition and Soffit Framing:
 - 1) Extend partition framing full height to structural supports or substrates above suspended ceilings.
 - 2) Frame door openings to comply with GA-600 and with gypsum board manufacturer's applicable written recommendations, unless otherwise indicated. Screw vertical studs at jambs to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs.
 - a) Install two studs at each jamb, unless otherwise indicated.
 - 3) Frame openings other than door openings the same as required for door openings, unless otherwise indicated. Install framing below sills of openings to match framing required above door heads.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The furnishing and installation of ceramic floor tile and base to the extent as shown on the drawings and specified herein.
- B. Under Alternate 1, provide floor-to-ceiling ceramic wall tile in Restrooms 106, 108, and 109.

1.2 RELATED WORK

- A. Joint Sealants – Section 07 92 00

1.3 QUALITY ASSURANCE

- A. Tile Council of North America (TCA) “Handbook for Ceramic Tile Installation” shall be used as a guide to assist in standardizing installation specifications.
- B. ANSI Ceramic Tile Standard: Provide tile that complies with A137.1, “Specifications for Ceramic Tile”.
- C. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI Standards referenced in “Setting and Grouting Materials” Article.
- D. International Standards and Training Alliance (INSTALL): The use of certified INSTALL professionals is highly recommended, however only one installer on site is required to hold this certification.
 - 1) The installer certificate(s) documenting this certification must be submitted with shop drawings.

1.4 SUBMITTALS

- A. Submit two (2) full sized samples of tile upon request of the architect.
- B. Submit shop drawings to the architect for approval, showing control joints, elevations, sections, contours, and markings.
- C. Submit mortar, mastic, and grout manufacturer data for review and approval.

2. PART 2 - PRODUCT

2.1 MORTAR

- A. Portland Cement - ASTM C-150 Type 1
- B. Sand - ASTM C-144, 100% passing #16 screen.

- C. Hydrated Lime - ASTM C-207 Type S
- D. Setting mortar for ceramic wall tile shall be dry-set formula 763 as manufactured only by manufacturers licensed by the Tile Council of America, Inc. (ANI A118.1).
- E. Setting mortar for mud set ceramic floor tile shall be Portland cement mortar according to ANSI A108.2 (1 part Portland cement to 4 parts damp sand with reinforcing).

2.2 CONTROL JOINT

- A. Control joint in ceramic tile shall be installed by this contractor. Material shall be type "C" sealant per Section 07 92 00.

2.3 GROUT

- A. Floors: Grout shall be one of the following. Color to be selected by architect.
 - 1) Hydroment Color-Poxy
 - 2) TEC TA 470 Epoxy
 - 3) Custom Building Products 100% Solids Epoxy Grout
- B. Walls: Latex modified grout by Mapei, Hydroment, Custom Building Products, or TEC.
- C. Grout needed shall be based on joint space:
 - 1) Eighth of an inch or less - Use unsanded/dry grout.
 - 2) Eighth of an inch or more - Use sanded grout.

2.4 FLOOR TILE

- A. Ceramic floor tile and base (8"x36") shall be "Magnolia" by Florida Tile (contact: Mary Hunt with Beaver Tile & Stone, 248.675.5070) or equal by Daltile or Tilebar. Tile shall conform to TCA 137.1.
 - 1) Color: Burl 28325
 - 2) Thickness: 11mm
 - 3) Finish: Matte
 - 4) Installation Pattern: Offset installation running parallel to the door.
 - 5) Testing Performance:
 - a) COF: ASTM C1028 Dry-0.8 / Wet-0.6
 - b) DCOF AcuTest: ASTM C1027 Pass
 - c) Durability Classification: ASTM C1027 – Class IV
 - d) Glaze Hardness: Mohs Scale – 7 Mohs
 - e) Break Strength: ASTM C648 – 800 lbs.
 - f) Water Absorption: ASTM C373 - <0.5%

- B. For ceramic base, install ceramic planks as an 8"H base. Provide metal trim components; cove where floor meets base and finished trim on exposed unfinished edge of tile. See products specified below.

- 1) If Alternate 1 is accepted, eliminate 8" base and provide floor-to-ceiling wall tile.

2.5 WALL TILE (ALTERNATE 1)

- A. Ceramic wall tile #1 (12"x24") shall be "Synchronic" by Daltile (contact Taylor Sheppard, 224.374.4180) or equal by Crossville, Tilebar, VITL, or WOW. Tile shall conform to TCA 137.1.

- 1) Locations: All three non-wet walls in Restrooms 106, 108, and 109
- 2) Color: White SY30 – Textured
- 3) Thickness: 5/16"
- 4) Finish: Matte
- 5) Installation Pattern: TBD by architect
- 6) Testing Performance:
 - a) Breaking Strength (ASTM C648 or ISO 10545-4): >275 lbs
 - b) Chemical Resistance (ASTM C650 or ISO 10545-13): Resistant
 - c) DCOF: >=0.42
 - d) Mohs Hardness (EN101): 8.0
 - e) Water Absorption (ASTM C373 or ISO 10545-3): <0.5%

- B. Ceramic wall tile #2 (2.5"x10") shall be "Textire Pattern Mix" by WOW (contact: Kathleen Black w/ Virginia Tile, 248.467.4362) or equal by Daltile or Tilebar. Tile shall conform to TCA 137.1.

- 1) Locations: The wet wall in Restrooms 106, 108, and 109
- 2) Color: Ocean
- 3) Thickness: approximately 7mm
- 4) Finish: Matte
- 5) Installation Pattern: TBD by architect

- C. Tile shall have polymer-fortified grouted joints. Tile shall conform to TCA 127.1. Do not set cove base on top floor tile.

- D. Trim and Shapes: Provide all required shapes as cove, bullnose, caps, angles, strips, etc., and unless noted otherwise, all internal corners shall be square and all external corners shall be bullnosed. Where ceramic tile occurs at door frames and openings, it shall be finished with a course of bullnose.

2.6 METAL TRIM COMPONENTS

- A. COVE-SHAPED PROFILE

- 1) Provide Schluter DILEX-EHK cove-shaped profile, or approved equal, at inside corners of tiles walls and at floor/wall transitions in lieu of cove base.

- 2) Finish: TBD by architect
- 3) Radius: 23/32"-wide radius to prevent water penetration and dirt accumulation.

B. DECORATIVE PROFILE FOR BASE

- 1) Provide Schluter RONDEC-DB, or approved equal, at top edge of tile base.
- 2) Finish: TBD by architect

C. OUTSIDE WALL CORNER

- 1) Provide Schluter RONDEC finishing and edge-protection profile, or approved equal, at outside corners of tiled walls and at top of wall tile in Women's 102.
- 2) Finish: TBD by architect
- 3) Reveal forms symmetrically rounded corner along the surface edge.

D. TRANSITION STRIPS

- 1) Provide Schluter transitions, or approved equal, where ceramic tile abuts other flooring material.
- 2) Finish: TBD by architect

E. Basis of design is Schluter, or equals by Great Lakes Tile Products or Dural.

2.7 THRESHOLDS

A. Thresholds abutting concrete or terrazzo shall have bullnose edge.

3. PART 3 - EXECUTION

3.1 INSPECTION

A. Prior to starting installation of ceramic tile, all surfaces shall be inspected for defects and any such defects shall be submitted in writing to the architect.

3.2 INSTALLATION

- A.** Ceramic tile installation shall be mud set.
- B.** Install & prepare setting surface to flat for ceramic tile installation. Use self-leveling mortar or use medium bed mortar for major leveling issues when necessary.

- C. Install ceramic wall tile and base using thin bed setting mortar and latex modified grout, as noted in the TCA base/cove alternates flush installation shown on page 12- 1999 edition.
- D. Install mud set ceramic floor tile using Portland cement mortar method and latex modified grout. Color shall be selected by architect.
- E. Install control joints in underbed and tile floors (spaced approximately 16" o/c and where tile work abuts restraining surfaces, such as perimeter walls, curbs, columns, and pipes). Caulk everywhere two planes meet creating a true 90° angle (color gray) with half silicone/half latex caulk with acrylic. Caulk for tile shall be by Hydroment or DAP or approved equal and shall be low-VOC.
- F. Portland Cement Mortar Method - Ceramic floor tile shall be installed in accordance with ANSI.A108.2. These shall be in accordance with Plate F102-03 Tile Handbook of the Tile Council of America.
- G. Follow manufacturer's recommendations.

3.3 EXTRA STOCK

- A. Provide 10% extra of the total square or linear footage for each color of floor tile and base used.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Acoustical ceiling tiles and panels.

1.2 QUALITY ASSURANCE

- A. Panels shall meet the minimum performance criteria:
 - 1) ASTM E 1264 for Class A materials.
 - 2) ASTM E 1414: CAC 35 minimum.
 - 3) ASTM E 1264: NRC .55 minimum.
 - 4) Moisture Resistant: No visible sag under conditions not to exceed 90 percent humidity and 104 degrees F.
 - 5) ASTM E 1477 LR 0.80 minimum.
 - 6) Note: Where possible, panels in public areas shall meet ASTM C 367.

1.3 SUBMITTALS

- A. Submit mock-up samples of each type of grid system and ceiling tile for architect's approval.

2. PART 2 - PRODUCTS

2.1 MINERAL BASE PANELS, WATER FELTED

- A. Type, form and finish, provide one of the following:
 - 1) ASTM E 1264, Type III, Form 2 with painted finish.
- B. Pattern and sound transmission class, provide one of the following:
 - 1) Perforated and fissured with square edge with CAC 35 minimum.
 - 2) Lightly perforated and lightly textured with square edge with CAC 35, moisture resistant.

2.2 HIGH DENSITY CERAMIC BASE PANELS WITH SCRUBBABLE FINISH (CLEANABLE)

- A. Type: ASTM E 1264, Type XX.

- B. Pattern, Edge, and Sound Transmission Class: Smooth pattern with square edge and CAC 40.

2.3 DIRECT HUNG SUSPENSION SYSTEMS, NONFIRE RESISTANCE RATED

- A. Type: Wide face, capped double web-galvanized steel, intermediate duty classification, G60 galvanizing, ASTM C 635.
- B. Suspension System Accessories: Attachment devices and hangers, ASTM C 635.
- C. Cap Material: Painted steel finish.

2.4 EXPOSED GRID SYSTEM

- A. USG DX/DXL exposed grid system as manufactured by USG Donn Series. Components shall be formed from commercial quality cold-rolled steel, electro-zinc coated and pre-finished exposed finish shall be low sheen satin baked white enamel. Equal by Chicago Metallic Corporation or Armstrong will be acceptable.
- B. The suspension system shall support the total ceiling assembly and the light fixtures and other items attached to the ceiling, as shown on drawings.
- C. USG Donn ZXLA environmental grid shall be used in rooms scheduled to receive scrubbable ceiling tile.
- D. Refer to drawings for ceiling layout. Refer to Heating and Ventilating Drawings and to Electrical Drawings for location of units and fixtures to be supported by the ceiling system. All ceiling scheduled to be fire rated shall have U.L. approved covers placed over all recessed lighting fixtures, and all air handling grilles.
- E. Hold Down Clips
 - 1) Use accessible hold down clips for access panels, located as required for electrical and mechanical controls.
 - 2) Provide hold down clips in all vestibules.
- F. Grid - For Non-Fire Rated Ceilings
 - 1) Main Tees Donn DX/DXL24 1½ high with 15.16 face
 - 2) 4'-0" Cross Tees - Donn DX422, 1" high with 15/16" face.
 - 3) 2'-0" Cross Tees - Donn DX/DXL216
 - 4) 6'-0" Cross Tees - Donn DX624
- G. Additional Components
 - 1) Hemmed edge steel wall angles. (Finish same as tees)

- 2) Steel miter molding for outside and inside corners. (Finish same as tees)
- 3) Grid adapters as required for soffits, light fixtures, or other items, built into the ceiling.
- 4) See drawings for details on ceiling clouds.

2.5 LAY-IN ACOUSTICAL PANEL

A. Acoustical Ceiling Tile

- 1) A1 & A2: 2'x2' – USG Mars ClimaPlus, Item 86185, 2' X 2' X 3/4" - non-rated
- 2) Equals by Certainteed and Armstrong.

2.6 ENVIRONMENTAL CHARACTERISTICS

- A. Custom sizes that eliminate most field cutting, diverting construction and demolition debris from landfills.
- B. Material constructed of sustainable resources.

2.7 SOUND BLANKET

- A. Furnish and install sound blankets over walls as shown on the reflected ceiling plans.

3. PART 3 - EXECUTION

3.1 PROJECT CONDITIONS

- A. Acoustical materials shall be installed under temperature and humidity conditions, closely approximately those that will exist when the building is occupied. All windows and doors shall be in place and glazed. The heating system shall be installed and operating where necessary to maintain proper conditions, before, during, and after the acoustical work is in process.

3.2 INSTALLATION FOR EXPOSED GRID SYSTEM

- A. The main runners shall be hung by securely tied wire hangers spaced not more than 4'-0" o.c. using 12-gauge galvanized annealed wire. Additional hangers shall be provided at light fixtures supported by grid system. Provide tie wires, as required, to support light fixtures at each corner. All wall angles shall have the hemmed edge notched to receive the main runner and cross tees to prevent raised ceiling boards where runners and tees meet wall channels.
- B. Provide Cross Tees under all heating supply and return outlets.
- C. The tie wires shall be securely saddle tied to the structural framing. This Contractor shall be responsible for the laying out and installation of all components of the

ceiling system and shall make suitable provision to accept items of equipment being installed by the Electrical and Mechanical contractors.

- D. All fire rated ceiling panels shall be clipped down to main runners and cross-tees. Provide for access panels to all Mechanical or Electrical Controls providing access clips for same.
- E. The ceiling suspension systems shall be capable of supporting twice the weight of all lighting fixtures (maximum 50 lbs. per fixture to support 100 lbs.). Exposed type fluorescent lighting fixtures mounted on acoustical ceilings shall have main "T" runner placed in the center of each fixture and/or row of fixtures. The "T" runner shall be of same length as the lighting fixture and shall be supported (not less than 4'-0" o.c.) to carry weight of the lighting fixture.
- F. The ceiling panels and their suspension system shall be installed in strict accordance with their respective manufacturers printed installation instructions, notwithstanding these specifications.
- G. Supply all wall channel moldings and T-bar runners as required for radiant heating ceiling panels.

3.3 SPARE PANELS

- A. Contractor shall supply two extra cartons for each type of acoustical ceiling panel used.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Resilient flooring, base, and stairtreads as shown on drawings and specified herein.

1.2 QUALITY ASSURANCE

- A. Fire Test Performance: Unless otherwise indicated, provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory.
 - 1) ASTM E 648 (Critical Radiant Flux) of 0.45 watts per sq.cm. or greater, Class I.
 - 2) ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.
- B. International Standards and Training Alliance (INSTALL): The use of certified INSTALL professionals is highly recommended, however only one installer on site is required to hold this certification.
 - 1) The installer certificate(s) documenting this certification must be submitted with shop drawings.

1.3 SUBMITTALS

- A. Submit product data for each product provided in this section.
- B. Submit full set of colors available for architect's approval.

1.4 DELIVERY, STORAGE & HANDLING

- A. Materials must be delivered in manufacturer's original, unopened and undamaged containers with identification labels intact.
- B. Store material protected from exposure to harmful weather conditions, on a clean, dry, flat surface protected from all possible damage. Rolls are to be stored in the upright position at all times.
- C. Recommended environmental condition for storage is a minimum of 55 degrees F.
- D. Material should not suffer excessive damage during handling (i.e. edge chipping, excessive warping etc)

2. PART 2 - PRODUCTS

2.1 LUXURY VINYL TILE (LVT)

- A. LVT shall be “Abide” by Shaw Contract (contact: Kristie Tucker, 419.346.5481) or equal by Interface, J+J Flooring, Mannington, or Tarkett.
 - 1) Color: Chocolate Walnut 4107V
 - 2) Size: 7”x48”
 - 3) Wear Layer: 0.02” (20 mil)
 - 4) Overall Thickness: 0.098”
 - 5) Construction: Heavy Commercial Luxury Vinyl Tile
 - 6) Finish: ExoGuard+
 - 7) Class/ASTM F1700: Class III, Type B
 - 8) Installation: Direct Glue
 - 9) Recommended Adhesive: Shaw 4100, 4151, or S150

2.2 RUBBER COVE BASE

- A. Rubber cove base, 4 and 6-inch height, 1/8 inch thick, complying with FS SS-W-40, Type I. Wall base shall be in 4 foot sections unless otherwise noted to match existing.
- B. Color: TBD
- C. Approved manufacturers include Roppe, Tarkett, and Nora.

2.3 DIMENSIONAL BASE

- A. Tarkett/Johnsonite Millwork Wall Base System, or equal by Allstate Rubber or Roppe.
- B. Profile shall be 4”H, design selected by architect
- C. Color shall be wood tone selected by architect.

2.4 RUBBER STAIR TREADS, RISERS, NOSINGS AND SKIRTINGS:

- A. Rubber stairtreads shall be by Roppe, or equal by Nora or Tarkett.
 - 1) Raised Design: 93 Textured
 - 2) Color Line: Fiesta

- 3) Provide grit strips in contrasting color on all stairs.
- 4) Colors to be selected by architect.

2.5 ADHESIVE

- A. Low emitting water-resistant type recommended by tile manufacturer to suit resilient floor tile products and substrate conditions indicated.

3. PART 3 - EXECUTION

3.1 SITE CONDITIONS

- A. Maintain a stable room and subfloor temperature for a minimum period of 48 hrs prior, during and 48 hrs after installation. Recommended temperature range: 65 degrees to 80 degrees.
- B. Installation to be carried-out no sooner than the specified curing time of concrete subfloor (normal density concrete curing time is approximately 28 days for development of design strength).
- C. Moisture vapor emission content of the concrete slab must not exceed the tolerance of the adhesive used when tested using the Calcium Chloride test as per ASTM F 1869.
- D. Installation of commercial flooring will not commence unless all other finishes in the building have been completed.

3.2 WALL SURFACE INSPECTION

- A. All surfaces should be inspected prior to installation. Use only on structurally sound interior wall surfaces such as dry plaster, cured drywall, exterior grade plywood (Group 1, CC type), concrete, and masonry that are clean, smooth, dry, and structurally sound. Rubber base is not to be installed over non-porous surfaces such as vinyl or rubber wallcoverings, laminated masonite, plastic laminates, or non-porous paints, or freshly painted surfaces, or over existing alcohol resin adhesives. All surfaces must be completely free from moisture, alkali, old adhesive, dust dirt, wax, oil, grease, loose paint, or plaster, non-porous wall coverings or paints, and other extraneous coatings or materials that could prevent a successful bond. Plaster and cement must be thoroughly dry and cured. Any rough or uneven surfaces may telegraph through the wall base.
- B. Follow the manufacturer's recommendations for any patching materials. Warning: When removing old wall base or adhesives, unless they can be positively identified not to contain hazardous materials, you must presume the materials may contain hazardous materials. Follow the recommended practices for the proper removal and disposal of the materials.

3.3 FLOOR PREPARATION

- A. For applications on concrete slab on grade or below grade, verify vapor barrier below slab was installed. If no vapor barriers are installed, do not proceed with work until conditions have been met.
- B. Perform moisture condition test in each major area, minimum 1 per 2,000 square feet, prior to installation. Moisture condition shall not exceed 3 pounds per 1,000 square feet per twenty-four (24) hour day, in accordance with Rubber Manufacturers Association Test Method. Do not proceed with work until results of moisture condition tests are acceptable.
- C. Perform adhesive bond test in each major area, minimum 1 per 2,000 square feet, prior to installation. Examine after seventy-two (72) hours to determine whether bond is solid and no moisture is present. Do not proceed with work until results of bond test are acceptable.
- D. Install resilient flooring in accordance with manufacturer's printed installation instructions. Comply with the following:
 - 1) Layout resilient flooring to provide equal size at perimeter. Adjust layout as necessary to eliminate resilient flooring which is cut to less than half full width.
 - 2) Lay resilient flooring with arrows in the same direction.
 - 3) Install resilient flooring without cracks or voids at seams. Lay seams together without stress. Remove excess adhesive immediately.
 - 4) Scribe resilient flooring neatly at perimeter and obstructions.
 - 5) Extend resilient flooring into reveals, closets and similar openings.
 - 6) Install reducer strips at exposed edges.
 - 7) Do not mix manufacturing batches of color within the same area.
 - 8) Do not install resilient flooring over building expansion joints.
 - 9) Do not install defective or damaged resilient flooring.
- E. Concrete floors with curing, hardening, and breaking compounds shall be abraded with mechanical methods only to remove compounds. Use blastrac or similar equipment.
- F. Fill voids, cracks and depressions with trowel-applied leveling compounds acceptable to manufacturer. Remove projections and repair other defects to tolerances acceptable to manufacturer.
- G. Vacuum subfloors immediately prior to installation to remove loose particles.

- H. The beginning of installation stipulates the acceptance of surface and site conditions.
- I. Installation will not be carried out unless above conditions are satisfied. Report any discrepancies to the General Contractor for correction.

3.4 INSTALLATION FOR RUBBER BASE

- A. Spread adhesive with a saw-tooth spreader evenly on the back of the base or wall surface. DO NOT spread adhesive within ¼" from the top of the wall base or allow adhesive to dry or skinover.
- B. Caution: DO NOT STRETCH the wall base. The wall base can be stretched while rolling and will later return to its original length causing gaps at the seams. Bond the base to the wall within 15 minutes after adhesive application and lightly roll with a hand wall base roller. At least 90% of the base must be covered with adhesive. Adhesive open time will vary upon the type of surface, temperature of the surface, ambient temperature, humidity, and proper conditioning of the adhesive.

3.5 INSTALLATION FOR LVT

- A. Material should always be visually inspected prior to installation. Any material installed with visual defects will not be considered a legitimate claim as it pertains to labor.
- B. Make sure all material is from the same batch number (dye lot).
- C. LVT (squares and planks) – install using conventional square and plank tile installation techniques. Plank products should have a minimum of 6-8" seam stagger.
- D. Carefully determine where to begin square or plank tile installation based on your center line of the main room.
 - 1) It is customary to center the rooms and hallways so borders are not less than half a square or plank tile.
- E. Working out of multiple boxes at a time is recommended.
- F. Make sure cut edges are always against the wall.
- G. To properly cut LVT products, score the top side of the material with a utility knife. Bend the product and finish the cut through the backside. This will ensure the cleanest cut. It may be necessary to use a heat gun to cut around vertical obstructions. Allow the heated LVT to return to room temperature before installation.
- H. Cutting the product into a fine point may lead to delamination. Use an ethyl cyanoacrylate based super glue to help fuse the LVT point together. Be sure to

clean all glue from the decorative surface immediately. Alcohol based super glues may cause the vinyl to swell.

- I. If using adhesive, roll the plank/tile with a 3 section coated 100 lb. roller. Re-roll the entire glued floor area with the 100 lb. roller within the working time of the adhesive. Continue to roll the floor throughout the working day to ensure proper bond.

3.6 INSTALLATION OF RUBBER

- A. Lay rubber tile in accordance with recommended specifications of the manufacturer. Use only experienced workmen. Lay tile with joints tight and in true alignment.

3.7 CLEANING AND PROTECTION FOR RESILIENT PRODUCTS

- A. DO NOT rub or apply lateral or vertical pressure to the wall base for at least 72 hours after the installation is complete to allow the adhesive to properly cure.
- B. At completion of installation, and when directed by the Owner, clean all base, treads, and tile (including adhesive smears from adjacent surfaces) with a cleaner recommended by the manufacturer. It is the intent that the cleaning be done just prior to the occupancy of the premises by the Owner. The Contractor shall provide the Owner with the manufacturer's recommendations for cleaning and maintenance.
- C. Floor coverings, base, etc., shall be clean, smooth free from buckles, cracks, projecting edges, with butt joints tight and in alignment.

3.8 All preparation and installation of resilient products shall follow the manufacturers' recommendations.

3.9 EXTRA STOCK

- A. Provide a minimum of 5% of resilient materials listed per color selected.

◆END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Exterior and interior painting with opaque finishes. Painted mechanical and electrical identification. Primers, sealers, finish paints, and stains.

1.2 QUALITY ASSURANCE

- A. Codes and Standards: In addition to complying with pertinent codes and regulations, comply with "Standard (Type 1)" as defined by the Painting and Decorating Contractors of America in their "Modern Guide to Paint Specifications," current edition.
- B. All coatings shall conform to the current VOC regulations for the Ohio EPA.

1.3 SUBMITTALS

- A. Submit a list of the products to be used by "type" as specified under 2.2 below.

1.4 COLOR - FINISH SAMPLES

- A. The Architect will provide a complete schedule of colors and sheens desired, in advance of commencing work. The Painting Contractor shall obtain same from the Architect together with any additional instructions as to intermixes or let-downs desired, and proceed to prepare duplicate sets of samples of treatments for all major surfaces.
- B. Samples shall each be made on material like that to be treated and the material shall be positioned, during execution of the sample to simulate the job conditions, (i.e., vertical, overhead horizontal, or below eye level horizontal). One half of the sample shall show the completed treatment, and the other half shall show the successive steps taken in producing it. When approved, samples will be so marked with one set retained by each party.
- C. Approved sample quality shall be strictly adhered to on the job site. If additional coats are required to reproduce approved quality, these shall be applied by the Contractor without additional cost to the Owner.

1.5 SCOPE

- A. Except as otherwise specified herein or indicated on the room finish schedule, include all necessary preparation and the complete finishing of all metal parts and surfaces, exterior and interior, that are not specified to be completely finished by others as installed. Also paint all concrete block masonry, concrete, plaster, and wall surfaces exposed to view at completion of the project, in finished areas or in areas requiring treatment for appearance or protection.

- B. In finished areas, include the finishing of all ferrous metal equipment items, piping, ductwork, and conduit in contracts for other Divisions of the Work, and furnished either bare, zinc-coated (galvanized) or in prime coat only; also similar finishing of the supports and insulated coverings from same. Inspect drawings and specifications for such contracts fully, and determine from them the exact extent of such work to be performed by other sections of the specifications.
- C. Include alcoves, recesses, and closets, not specified otherwise, for same treatments (on their respective "finish" parts) as specified or scheduled for similar corresponding parts in the space off which they are located. Include wall surfaces back of such items as open shelving, radiators, and exposed fin type heating units, for same treatment as balance of wall.
- D. Multiple paint colors and accent walls may be selected for project.

1.6 GENERAL REQUIREMENTS

- A. Ceilings, otherwise, will be painted a different color than walls unless stated.
- B. Access door and registers will be painted the same color as surfaces adjacent thereto unless otherwise stated.
- C. Metal door frames will be painted a different color than walls adjacent thereto unless otherwise stated.
- D. Exposed piping will be painted color and texture to match walls or ceilings adjacent to it unless otherwise stated.
- E. Back priming of same material as specified for front side will be required herein for all interior and exterior wood trim which is in contact with exterior masonry walls or which is located in higher-than-normal humidity areas.
- F. Each coat of paint shall be slightly darker than preceding coat unless otherwise directed. Undercoats shall be tinted similar to finish coats.
- G. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers need to be confirmed by using the product MSDS sheets.

1.7 STORAGE

- A. Store materials on premises where directed. Keep storage space clean and accessible. At close of each day's work, oil or paint-soaked rags and other waste shall be placed in tightly covered metal containers or removed from the premises. Take every precaution to avoid damage by fire. In no case shall amount of materials stored exceed that permitted by local ordinances, State laws, or Fire Underwriters regulations.

1.8 SCAFFOLDING

- A. Provide, erect, and maintain all staging and scaffolding. Move when necessary at the option of the Architect to permit installation of other materials and remove from premises at completion of work.

1.9 PROTECTION

- A. Provide clean drop cloths, and other protection as approved to protect floors, doors, windows and other areas from damage. If paint is splattered on unintended surfaces, clean promptly, and leave in good condition.

1.10 USE OF PREMISES

- A. No plumbing fixtures, open waste or vent pipe, or other pipe of any kind, shall be used to dispose of paint materials, used rags, waste, or other material.
- B. No water closets, tubs, or fixture of any kind shall be used as supports for planking. All fixtures shall be thoroughly protected from damage at all times.

1.11 WORK NOT INCLUDED

- A. Do not paint or otherwise finish:
 - 1) Aluminum architectural features, such as door frames, doors and windows.
 - 2) Other architectural features, such as finish hardware furnished in aluminum, bronze, brass, plated ferrous metal, stainless steel or copper unless herein specified to be painted.
 - 3) Interior ceramic tile and glazed tile.
 - 4) Prefinished doors and prefinished door frames.
 - 5) Prefinished equipment.
 - 6) Copper, stainless steel or sheet aluminum parts, unless specified to be painted herein.
 - 7) Exterior door and window sills and exposed exterior concrete.
 - 8) Caulking and glazing compounds installed in or adjacent to aluminum doors or similar features.
 - 9) Wall or ceilings of Mechanical Shafts.
 - 10) Surfaces of galvanized sheet metal ductwork that will be concealed from view.

- 11) Areas where rubber base or ceramic tile base will be applied.
- 12) Plenum rated fire alarm cable, or fire alarm cable in open ceiling space

2. PART 2 – PRODUCTS

2.1 PAINT MATERIALS

- A. Paint and fillers shall be of type and brands hereinafter specified under "Types of Paint". Painting materials such as linseed oil, shellac, turpentine, etc., shall be of highest quality, and have identifying labels on containers.
- B. All paint shall be delivered to site in manufacturer's sealed containers. Each container shall be labeled by the manufacturer with manufacturer's name, type of paint, color of paint, and instructions for reducing. Thinning shall be done only in accordance with directions of manufacturer. Job mixing or job tinting may be done when approved by the Architect.
- C. Bids shall be based on the use of the specific brands and quality as herein-after specified. If Contractor desires to use materials of a manufacturer other than the materials specified, he shall make the request in writing to the Architect, giving the name of the manufacturer and the specific name of each product he offers as a substitute and shall state the amount, if any, to be added or deducted from his bid for such substitution. All substitution requests must be made ten days prior to the bid date.

2.2 PAINT COLORS

- A. Colors to be selected by architect.
- B. Camp Store 101 shall have three paint colors.
- C. Public Space 103 and Registration Office 104 shall have two paint colors.
- D. Door Frames shall match adjacent wall unless called out otherwise on approved submittal.
- E. Ceiling Paint shall be selected by architect.
- F. All paint colors shall be selected by architect. Consult architect for any paint colors not selected/approved.

2.3 TYPES OF PAINT

- A. Basis of design is Sherwin-Williams, with Benjamin Moore and PPG as approved equals. The kinds of paint and number of coats required on the various surfaces shall be as follows:
- B. EXTERIOR COATINGS

- 1) **Type EXT-1 | Exterior Wood – Painted**
 - a) First Coat: SW Oil Based Wood Primer
 - b) Second and Third Coat: SW A-100 Exterior Latex Satin, A82 Series
 - c) Paint manufacturer recommends pressure treated wood be allowed to weather a minimum of six months prior to coating. Contractor to obtain treated wood immediately to allow the start of weathering and communicate plans with architect to finish treated wood components.
- 2) **Type EXT-2 | Exterior Wood – Stained**
 - a) First and Second Coat: SW Woodscapes Semi-Transparent Exterior Stain, A15T5
- 3) **Type EXT-3 | Exterior Metal**
 - a) First Coat: SW Pro-Cryl Universal Metal Primer
 - b) Second and Third Coat: SW Pro Industrial Acrylic, Semi-Gloss

C. INTERIOR COATINGS

- 1) **Type INT-1 | Interior Drywall - Eg-Shel Finish**
 - a) First Coat: SW ProMar 200 Zero VOC Wall Primer B28W2600
 - b) Second and Third Coat: SW ProMar 200 Zero VOC Eg-Shel B20W2651 Series
 - c) Use on all interior drywall wall surfaces, except walls called out to receive epoxy.
- 2) **Type INT-2 | Interior Drywall - Epoxy Coating**
 - a) First Coat: SW ProMar 200 Zero VOC Wall Primer B28W2600
 - b) Second and Third Coat: SW Pro-Industrial Waterbased Catalyzed Epoxy Eg-Shel, B73 Series
 - c) Use on all interior drywall wall surfaces scheduled to receive epoxy.
- 3) **Type INT-3 | Interior Wood – Painted**
 - a) First Coat: SW Premium Wall & Wood Primer

- b) Second and Third Coat: SW ProClassic Water Based Semi-Gloss
 - c) Use on interior wood called out to be painted.
- 4) **Type INT-4 | Interior Wood – Stained**
 - a) First Coat: SW Minwax 250 VOC Stain
 - b) Second and Third Coat: SW Minwax Performance Series Waterbased Polyurethane Stain
 - c) Use on interior wood called out to be stained.
- 5) **Type INT-5 | Interior Metal - Semi-Gloss Finish**
 - a) First Coat: S.W. ProCryl Universal Primer, B66-310 Series - omit if metal has a shop coat of primer.
 - b) Second and Third Coat: SW Pro-Industrial Pre-Catalyzed Epoxy Semi-Gloss
 - c) Use on all items of miscellaneous metal including electric panels, fire extinguisher cabinets, piping and conduit exposed to view, access doors, grilles, hollow metal door frames, hollow metal doors, and metal heating cabinets.
- 6) **Type INT-6 | Interior High Performance Metal - Semi-Gloss Finish**
 - a) First Coat: SW Macropoxy 646 Fast Cure
 - b) Second and Third Coat: SW Hi-Solids Polyurethane
 - c) Use on items of miscellaneous metal including interior railings and steel ladders.
- 7) **Type INT-7 | Interior Galvanized Metal**
 - a) First Coat: SW ProCryl Universal Primer, B66-310 Series
 - b) Second and Third Coat: SW Pro-Industrial Pre-Catalyzed Epoxy Semi-Gloss
 - c) Use on interior exposed galvanized metal.
- 8) **Type INT-8 | Interior Concrete Floors**
 - a) First and Second Coat: H&C Clarishield Waterbased Wet Look Sealer, Semi-Glass
 - b) Use on interior concrete floors called out to be sealed.

- 9) **Type INT-9 | Interior Galvanized Metal – Ductwork**
 - a) First and Second Coat: SW Waterborne Acrylic Dryfall
 - [1] B42W1 on ductwork called out to be flat white
 - [2] B42BW3 on ductwork called out to be flat black
 - [3] B42T1 on ductwork called out to be a tinted paint color
 - b) Use on interior galvanized ducts called out to be painted.
- 10) **Type INT-10 | Interior Metal – Exposed Ceiling / Overhead Components**
 - a) First Coat: SW ProCryl Universal Primer, B66-310 Series
 - b) Second and Third Coat: SW Waterborne Acrylic Dryfall
 - [1] B42W1 on ductwork called out to be flat white
 - [2] B42BW3 on ductwork called out to be flat black
 - [3] B42T1 on ductwork called out to be a tinted paint color
 - c) Use on non-galvanized exposed metal deck, uncovered pipers, radiators, supports, and exposed ceiling components called out to be painted.

3. PART 3 – EXECUTION

3.1 PREPARATION OF SURFACES

- A. Follow manufacturer's recommendations for preparation of all surfaces.
- B. Steel and Iron – Remove grease, rust scale, and dust and touch up any chipped or abraded places on items that have been shop coated. Where steel and iron have a heavy coating of scale, it shall be removed by "Roto" scraping or sand blasting as necessary to produce a satisfactory surface for painting.
- C. Galvanized Iron – Shall be cleaned thoroughly with solvent to remove grease, residue, and corrosion products on the surface or with chemical washes used as directed by the manufacturer. All galvanized iron shall be given a special primer such as S.W. Galvanized Iron Primer. Galvanized iron which has been exposed to the weather for long periods of time and which shows rust shall be primed with a metal protective primer such as S.W. Kromik Metal Primer.
- D. Concrete Block – Before painting, all block shall be cleaned of all mortar, sand, and dirt. Any bad mortar joints or loose mortar shall be replaced and repaired before any painting is done.

- E. Wood - Sandpaper to smooth and even surface and then dust off. After primer or stain coat has been applied, thoroughly fill nail and other holes and cracks with plastic wood or putty. For natural finished work, putty shall be colored to match the wood.
- F. General – Before painting, remove hardware, accessories, plates, lighting fixtures, and similar item or provide ample protection of such items. Upon completion of each space replace above items. When necessary, disconnect radiators to permit painting of walls behind them, replace and reconnect upon completion. Remove doors if necessary to paint bottom edge. Use only skilled mechanics for removing and connecting above items. Where painted signs or numbers are applied on glass doors, the glass shall be thoroughly cleaned with soap and water prior to painting.

3.2 APPLICATION

- A. Environmentally friendly paints may have a longer drying time unlike traditional paint due to the composition. Contact manufacturer for recommendations.
- B. Do not apply exterior paint in damp, rainy weather, or until surface has thoroughly dried from the effect of such weather. Do not apply varnish or paint when temperature is below 50 degrees Fahrenheit.
- C. Surfaces to be stained or painted shall be clean, dry, smooth and adequately protected from dampness. Each coat of paint shall be applied in a good workmanlike manner, leaving a uniform finish and texture. Allow each coat to dry according to manufacturers written specifications before subsequent coats are applied.
- D. Finished work shall be uniform, of approved color, smooth and free from runs, sags, defective brushings, clogging, or excessive flooding. Make edges of paint adjoining other materials or colors sharp and clean without overlapping.
- E. Concrete block sealer and filler shall be airless sprayed and while still wet followed over with a Dynel roller with 3/8" pile or brushed to uniform the surface.
- F. Paint top and bottom edges of metal covered and hollow metal doors one coat.
- G. At completion, touch-up and restore finish where damaged and leave in good condition.

3.3 CLEAN-UP

- A. Refer to General Conditions and Supplementary General Conditions for specific requirements in cleaning up.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Photo display rail system in Public Space 103 and Registration Office 104.

1.2 SUBMITTALS

- A. Submit shop drawings that include the dimensions, quantities, and locations of all products, as well as product data.

2. PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. STAS Picture Hanging System – picturehangingsystem.com / 888.312.6971
- B. Equals: AS Hanging Systems, Systematic Art, Gallery System Art Displays, or approved equal.

2.2 SYSTEM

- A. Model: STAS Cliprail Pro
- B. Color: Silver
- C. Length: Provide (2) 59"L units at each location
- D. Cords: Clear
- E. Clips: Stainless steel zipper hook that can carry loads up to 33 lbs
- F. Provide (6) cords and (12) clips with each 59"W unit

3. PART 3 - EXECUTION

- 3.1 Follow manufacturers recommendations for installation.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Signage designed and configured for interior installation.

1.2 QUALITY ASSURANCE

- A. Comply with signage requirements indicated in the Americans with Disabilities Act.

1.3 SHOP DRAWINGS

- A. Submit shop drawings of each product specified herein showing size, details of construction, and installation. Schedule of inscriptions shall be included. Do not fabricate any product until shop drawings are approved and colors selected.

2. PART 2 - PRODUCTS

2.1 PANEL SIGNS

- A. Type: Framed
 - 1) Aluminum and molded plastic frames are acceptable.
- B. Material: Plastic.
- C. Copy: Raised text, Braille and pictograms.
- D. Room identification signs shall have raised symbols and Brailled characters. Raised letters shall be one monolithic piece with the sign. Letters shall be raised 1/32" and shall be 1" high and room numbers shall be 1-1/2" high. Signs shall be placed at the latch side of the door and shall be mounted 60" above the floor.
- E. Provide white vinyl foam tape for anchorage to walls.
- F. All signs mounted on glass are to have a blank backer plate on opposite side of glass.
- G. Thickness shall be 3mm.

2.2 LOCATIONS

- A. Schedule:
 - 1) Inscriptions may be changed by owner.

Cons. No.	Room Name	Quantity	Size (HxW)	Inscription
101	Camp Store	1	5"x9"	Maximum Occupancy
		2	8"x8"	Exit
102	Exterior Storage	3	5"x9"	Exterior Storage
103	Public Space	2	3"x9"	Public Space
		1	5"x9"	Maximum Occupancy
		1	8"x8"	Exit
104	Registration Office	3	3"x9"	Registration Office
		1	8"x8"	Exit
105	Janitor	1	3"x9"	Maintenance
106	Unisex	1	9"x6"	Restroom
107	Corridor	2	8"x8"	Exit
108	Unisex	1	9"x6"	Restroom
109	Unisex	1	9"x6"	Restroom
110	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
111	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
112	Mechanical Yard	1	3"x9"	Mechanical
113	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
115	Stair	2	3"x9"	Stairs
116	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
		1	8"x8"	Exit
117	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels

118	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
119	Office	1	5"x5"	Office 110 With (2) horizontal inserts for owner room labels
201	Storage	1	3"x9"	Storage
202	Mechanical	1	3"x9"	Mechanical

B. Note: Sign sizes may be adjusted to fit standard frame sizes.

C. Provide 8"x8" tactile EXIT signs at all exterior doors.

2.3 PARK MAP

A. Provide one 48"x48" acrylic park map sign in Camp Store 101.

B. Material shall be 3/16" thick clear acrylic unaffected by moisture or UV light and 17 times stronger than glass.

C. Image shall be reverse laser engraved on back and sandwiched between two clear acrylic panels. Image shall be full color, as provided by owner.

D. Acrylic sign shall have four holes pre-drilled in the corners and shall be installed using a metal rod system.

E. Submit signage material to architect for approval prior to fabrication.

2.4 ODNR SIGN

A. See custom sign detail on drawing A901.1.

B. Located on front of desks in Camp Store 101 and Registration Office 104.

2.5 DEDICATION PLAQUE

A. Provide one (1) 12"W x 18"H building dedication plaque, location TBD.

B. Plaque shall be bronze with dark oxide textured background and raised bronze text.

C. Mounting: Blind stud mounting with drilled and tapped holes

D. Copy shall be determined by owner.

E. See images below for owner's standard style and layout.

DEDICATION PLAQUE TEMPLATE

12.0"

18.0"

Area Name

Structure Name

Ohio Department of Natural Resources

ODNR Division Name

Dedication date or year

3" DIA LOGO

DARK OXIDE

Project specific copy about the project goes here.

Mike DeWine, Governor

Mary Mertz, Director

Architect / Engineer Firm Name

Contractor Firm Name

Other Major Sub-Contractors if applicable and deemed appropriate by administration

This Project Completed with Capital Funding Appropriated by the _____ General Assembly.

State of Ohio Participation:
Wording should be consistent.

NOTES:

Name of Ohio Department of Natural Resources (ODNR) Property Area (ex. Deer Creek State Park Lodge)
Facility Type or Structure Name (ex. Entrance & Canopy)
Office of the Governor Seal, ODNR Seal (logo files will be provided)
Project Specific Blurb (**Approved by Office of Communications**)
Current Governor Name, Current Director Name
Fonts used should be Montserrat Semi-Bold

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Attach sign to substrate with white vinyl foam tape.
- B. All products shall be installed where indicated by the Architect, in accordance with the manufacturer's recommendations.

◆ END OF SECTION ◆

SECTION 10 14 53
STAINLESS STEEL SIGNAGE

1. PART 1 - GENERAL

1.1 SHOP DRAWINGS

- A. Submit one set of drawings of each product specified herein, to the Architect for approval, showing sizes, details of construction and installation. Do not fabricate any product until shop drawings are approved and colors selected.

2. PART 2 – PRODUCTS

2.1 CUSTOM STAINLESS STEEL ODNR SIGN

- A. Furnish and install (2) custom 10 gauge stainless steel sign cut from one piece of stainless steel plate as shown on the elevations and detail J901.1/A901.1. See detail for sizes and location.
- B. Material: Stainless steel plate ASTM A240 type 304 or type 316.
- C. Finish: #4 (320 grit) (satin/brushed/directions)
- D. Furnish stainless steel stand off brackets for installation of sign.

3. PART 3 – EXECUTION

- 3.1 All products shall be installed where indicated by the Architect, in accordance with the manufacturer's recommendations.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes wall protection systems.
- B. Related sections: The following sections contain requirements related to this section:
 - 1) Blocking in walls for fasteners

1.2 REFERENCES

- A. National codes (IBC, UBC, SBCCI, BOCA and Life Safety)
- B. American Society for Testing and Materials (ASTM)
- C. Underwriters Laboratories (UL)

1.3 SUBMITTALS

- A. Product data and detailed specifications for each system component and installation accessory required, including installation methods for each type of substrate.
- B. Shop drawings showing locations, extent and installation details of corner guards. Show methods of attachment to adjoining construction.
- C. Samples for verification purposes: Submit the following samples, as proposed for this work, for verification of guard.
 - 1) 12" (304.8mm) long sample of each model specified.
- D. Product test reports from a qualified independent testing laboratory showing compliance of each component with requirements indicated.
- E. Maintenance data for wall protection system components for inclusion in the operating and maintenance manuals specified in Division 1.

1.4 QUALITY ASSURANCE

- A. Code compliance: Assemblies should conform to all applicable codes including IBC, UBC, SBCCI, BOCA and Life Safety.
- B. Fire performance characteristics: Provide wall protection system components with UL label indicating that they are identical to those tested in accordance with ASTM-E84 (CAN/ULC S102.2) for Class 1 characteristics listed below:
 - 1) Flame spread: 25 or less

2) Smoke developed: 450 or less

- a) International Fire Ratings Include:
- b) UK: BS476-part 7, Class 1.
- c) France: MI.
- d) Spain: MI.
- e) Germany: DIN4102, BI Classification.
- f) Italy: Class 1.

C. Impact Strength: Provide assembled wall protection units that have been tested in accordance with the applicable provisions of ASTM F476.

D. Chemical and stain resistance: Provide wall protection system components with chemical and stain resistance in accordance with ASTM D-1308.

E. Color match: Provide wall protection components that are color matched in accordance with the following:

- 1) Delta Ecmc of no greater than 1.0 using CIELab color space. (Specifier note: Construction Specialties' colors are matched under cool white fluorescent lighting and computer controlled within manufacturing tolerances. Color may vary if alternate lighting sources are present).

F. Single source responsibility: Provide all components of the wall protection system manufactured by the same company to ensure compatibility of color, texture and physical properties.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver materials to the project site in unopened original factory packaging clearly labeled to show manufacturer.
- B. Store materials in original, undamaged packaging in a cool, dry place out of direct sunlight and exposure to the elements. A minimum room temperature of 40°F (4°C) and a maximum of 100°F (38°C) should be maintained.
- C. Material must be stored flat.

1.6 PROJECT CONDITIONS

- A. Materials must be acclimated in an environment of 65°-75°F (18°-24°C) for at least 24 hours prior to beginning the installation.
- B. Installation areas must be enclosed and weatherproofed before installation commences.

2. PART 2 – PRODUCTS

2.1 CORNER GUARDS

A. MANUFACTURER

- 1) The basis of design for corner guard products shall be IPC Door and Wall Protection Systems, InPro Corporation, PO Box 406 Muskego, WI 53150 USA; Telephone: 800.222.5556, Fax: 888.715.8407, www.inprocorp.com.
- 2) Approved equals include Acrovyn, Korogard, and Wallprotex.

B. MATERIALS

- 1) Vinyl shall be manufactured from chemical and stain resistant polyvinyl chloride with the addition of impact modifiers. No plasticizers shall be added (plasticizers may aid in bacterial growth).
- 2) Colors shall be one of manufacturer's standard colors and shall be selected by the architect.

C. PRODUCTS

- 1) 90-Degree Corner Guard
 - a) InPro Corp. Model #160, High Impact Corner Guard Profile
 - b) Vinyl: Snap on cover of .080" (2mm) thickness
 - c) Dimensions: 2" (51mm) x 2" (51mm), 90 degree
 - d) Height: 4' (2.44m) standard heights
 - e) Color: TBD by architect

D. COMPONENTS

- 1) Top caps and bottom caps shall be made of injection molded thermoplastics.
- 2) Fasteners: All mounting system accessories appropriate for substrates indicated on the drawings shall be provided.
- 3) Optional flexible top caps shall be made of injection molded flexible PVC.

E. FABRICATION

- 1) General: Fabricate wall protection systems to comply with requirements indicated for design, dimensions, detail, finish and member sizes.

F. LOCATIONS

- 1) Corner guards shall be provided at drywall corners as shown on drawings.

3. PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- 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) Do not proceed until unsatisfactory conditions have been corrected.
 - 2) Preparation
- B. Surface preparation: Prior to installation, clean substrate to remove dirt, debris and loose particles. Perform additional preparation procedures as required by manufacturer's instructions.
- C. Protection: Take all necessary steps to prevent damage to material during installation as required in manufacturer's installation instructions.

3.2 INSTALLATION

- A. Install the work of this section in strict accordance with the manufacturer's recommendations, using only approved mounting hardware, and locating all components firmly into position, level and plumb.
- B. Temperature at the time of installation must be between 65°-75°F (18°-24°C) and be maintained for at least 48 hours after the installation.

3.3 CLEANING

- A. General: Immediately upon completion of installation, clean vinyl covers and accessories in accordance with manufacturer's recommended cleaning method.
- B. Remove surplus materials, rubbish and debris resulting from installation as work progresses and upon completion of work.

3.4 PROTECTION

- A. Protect installed materials to prevent damage by other trades. Use materials that may be easily removed without leaving residue or permanent stains.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Supplied and installed by contractor:

- 1) Grab Bars
- 2) Mirrors
- 3) Coat Hook
- 4) Mop & Broom Holder
- 5) Individual Mop Clip
- 6) Baby Changing Station

B. Supplied by owner, installed by contractor:

- 1) Toilet Paper Dispenser
- 2) Soap Dispenser
- 3) Paper Towel Dispenser
- 4) Sanitary Napkin Dispenser
- 5) Sanitary Napkin Disposal
- 6) Electric Hand Dryer

- a) Restrooms 106 and 108 only (in addition to paper towel dispensers)

1.2 QUALITY ASSURANCE

A. NFPA 70 – National Electrical Code

B. Underwriters Laboratory

1.3 SUBMITTALS

- A. Submit manufacturer's product data for each item, along with installation instructions.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Stainless Steel: AISI Type 302/304, with polished No. 4 finish, 0.034-inch (22-gauge) minimum thickness.
- B. Brass: Unleaded, flat products, ASTM B19; rods, shapes, forgings, and flat products with finished edges, ASTM B16; castings, ASTM B30.

- C. Sheet Steel: Cold rolled commercial quality ASTM A336, 0.04-inch (20-gauge) minimum. Surface preparation and metal pretreatment as required for applied finish.
- D. Galvanized Steel Sheet: ASTM A527, G60.
- E. Chromium Plating: Nickel and chromium electro-deposited on base metal, ASTM B456, Type SC2.
- F. Mirror Glass: Nominal 6.0mm (0.23 inch) thick, conforming to ASTM C1036, Type I, Class 1, Quality q2, and with silvering electro-plated copper coating, and protective organic coating.

2.2 GRAB BARS

- A. Stainless Steel Type: Provide grab bars with wall thickness not less than 0.05 inch and as follows:
 - 1) Mounting: Concealed, manufacturer's standard flanges and anchorages.
 - 2) Clearance: 1-1/2" clearance between wall surface and inside face of bar.
 - 3) Gripping Surfaces: Smooth, satin finish, unless noted otherwise.
 - a) Manufacturer's standard non-slip texture in wet areas.
 - 4) Heavy Duty Size: Outside diameter of 1-1/4" minimum.
- B. The grab bars shall be model #UG, length as tabled, and heavy duty, as manufactured by AJ Washroom or equal by Bobrick, Bradley, or Gamco.
- C. See schedule below for locations.

CONS. NO.	QUANTITY	SIZE
106	1	42" L, 1-1/2" Dia.
	1	36" L, 1-1/2" Dia.
	1	18"L, 1-1/2" Dia.
108	1	42" L, 1-1/2" Dia.
	1	36" L, 1-1/2" Dia.
	1	18"L, 1-1/2" Dia.

109	1	42" L, 1-1/2" Dia.
	1	36" L, 1-1/2" Dia.
	1	18"L, 1-1/2" Dia.

2.3 MIRRORS

A. RESTROOM MIRRORS

- 1) Stainless Steel Framed Mirror: Mirror shall have a one piece, Type 304 stainless steel angle frame, 3/4"x3/4" with continuous integral stiffener on all sides and beveled front to hold frame tightly against mirror.
- 2) Corners shall be heliarc welded, ground and polished smooth.
- 3) All exposed surfaces shall have satin finish with vertical grain.
- 4) Float/plate glass mirror shall be guaranteed for 15 years against silver spoilage.
- 5) All edges shall be protected by plastic filler strips and the back shall be protected by full size, shock absorbing, water resistant, nonabrasive, 1/8" thick polyethylene padding.
- 6) Galvanized steel back shall have integral hanging brackets for mounting on concealed rectangular wall hanger(s). Mirror shall be secured to hanger(s) with concealed Phillips head locking screws located in bottom of frame.
- 7) Mirrors shall be the B-290 Series as manufactured by Bobrick or equal by AJ Washroom, Bradley, or Gamco.
- 8) See schedule below for locations.

CONS. NO.	QUANTITY	SIZE
106	1	16"x36"
108	1	16"x36"
109	1	16"x36"

2.4 COAT HOOK

- A. Surface mounted stainless steel towel pin shall be constructed entirely of Type 304 stainless steel with bright polished finish.
- B. Flange shall be equipped with 16-gauge mounting bracket, which locks to concealed 16-gauge wall plate with stainless steel lock screw.
- C. Cap shall be 10-gauge stainless steel welded to post.
- D. Towel hooks shall be model 5153 single hook as manufactured by Gamco or equal by Bobrick, AJ Washroom, or Bradley.
- E. See schedule below for locations.

CONS. NO.	QUANTITY
106	2
108	2
109	2

2.5 MOP & BROOM HOLDER

- A. Surface mounted mop and broom holders with shelf shall be Type 304 stainless steel with satin finish.
- B. Unit shall be 36 inches long with 4 spring-loaded, rubber cam holders. Unit shall hold (4) mops.
- C. Mop and broom holder shall be model US-2 as manufactured by Gamco or equal by Bobrick, AJ Washroom, or Bradley.
- D. Provide (1) mop holder at each mop sink location.

2.6 INDIVIDUAL MOP CLIP

- A. Surface mounted individual mop/broom handle clip. Fabricated of cadmium plated steel and ribbed for rigidity. Pivoting spring loaded serrated rubber cam holds round handles of 7/8" to 1-1/4" diameter wedged against ribbed clamp plate.
- B. Individual mop clip shall be model 0795 as manufactured by ASI or equal by Thunder Group or Regency Space Solutions.
- C. Provide (2) individual mop clips at each mop sink location.

2.7 BABY CHANGING STATION

- A. Baby changing station shall be constructed of high-density polyethylene and reinforced with steel-on steel hinges. Color to be selected by architect.
- B. Station shall withstand 250 pound load and tested to 390 pounds.
- C. Station shall come equipped with molded-in-dual liner dispensers. Each liner dispenser shall holds approximately 50 of the 036-LCR liners.
- D. Unit shall have safety belt with cam-buckle that is adjustable with one hand and a pneumatic gas shock mechanism for smooth, safe open and close motions.
- E. Overall size 34 ¼" W x 16"H x 18"D in open position.
- F. Approved manufacturers include Gamco, Koala Bear Care, and Bobrick.
- G. See schedule below for locations.

CONS. NO.	QUANTITY
106	1
108	1

- 2.8 Contractor to verify all quantities and locations of toilet accessories on drawings and bid greatest quantity.

3. PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install accessories with vandal resistant fasteners.
- B. Follow manufacturer's recommended installation instructions.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 WORK INCLUDED

- A. Fire Extinguishers
- B. Cabinets
- C. Accessories

1.2 REFERENCES

- A. Latest edition of NFPA 10 Portable Fire Extinguishers and Ohio Fire Code.
- B. ICC A117.1 (Latest Edition) Accessibility Guidelines

1.3 QUALITY ASSURANCE

- A. Conform to latest edition of NFPA 10, Ohio Fire Code, and Ohio Building Code requirements for portable fire extinguishers.
- B. Provide fire extinguishers, cabinets, and accessories by single manufacturer.

1.4 SUBMITTALS

- A. Submit brochure and project data for approval by the Architect.
- B. Submit location of manufacture of miscellaneous specialties.
- C. Submit certification that fire extinguishers are halon-free.

2. PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. Where shown on the drawings, provide fire extinguishers, cabinets, and accessories manufactured by Larsen's.
- B. Equal by Buckeye Fire Equipment and J. L. Industries are also approved.

2.2 FIRE EXTINGUISHERS

- A. Dry chemical type: Larsen's model MP6, UL Classification 3A-40B:C or model MP10, UL classification 4A-80B: Approved equal by Buckeye and J.L. Industries

2.3 FIRE EXTINGUISHER CABINETS

- A. Where indicated on schedule, provide Larsen's semi-recessed cabinet model No. 2409-6R with vertical duo door with tempered glass. Door and trim to be fabricated from cold-rolled steel.

2.4 ACCESSORIES

- A. Extinguisher Wall Brackets
- B. Provide brackets as scheduled.

2.5 SCHEDULE

Room	Fire Extinguisher	Quantity	Cabinet/Bracket
114	MP6	2	Semi-Recessed Cabinet
201	MP10	1	Bracket

2.6 IDENTIFICATION SIGNAGE

- A. Provide manufactured identifying signage above each fire extinguisher location. Signs to be minimum 2-way projecting signs with “Fire Extinguisher” lettering in “red” on “white” background. Size of sign and lettering and location to be per the requirements of authorities having jurisdiction.

3. PART 3 - EXECUTION

3.1 INSPECTION

- A. Verify that rough openings for cabinets are correctly sized and located.
- B. Verify servicing, charging and tagging of all fire extinguishers.

3.2 INSTALLATION

- A. Install the items of the section in strict accordance with the original design, approved shop drawings, and requirements of agencies having jurisdiction, as approved by the Architect, anchoring all components firmly into position.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The furnishing and installation of the law enforcement lockers, including all accessories as shown on drawings and specified herein.

1.2 SHOP DRAWINGS

- A. Submit shop drawings of all locker installations, showing precise locations, fabrication details and installation details, to the Architect for approval prior to starting fabrication.
- B. Submit color card.

2. PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Lockers shall be as manufactured by Republic or equals by Superior, Penco and Debourgh.

2.2 LOCKER TYPES

- A. Provide a quantity of (6) 24"Wx36"Dx90"H Law Enforcement Lockers in Office 116.

2.3 METAL LOCKERS

- A. Upper Unit - Prime, high-grade Class 1 mild annealed, cold-rolled A.S.T.M. A1008/A steel free from surface imperfections. Optional A.S.T.M.-A653/A Galvannealed steel is available for high humidity atmospheres. 16-gauge sides, top, and bottom. 18 gauge back.
- B. Frame - 16-gauge formed steel channels. Vertical members shall have an additional flange to form continuous door strike. Corners shall be lapped and welded into a rigid assembly. Bottom cross members shall have a tang at each end that fits through slot in rear flange of upright frame member to prevent twisting out of alignment. The top and bottom cross members shall provide support for front edge of locker top and locker bottom.
- C. Hinges – 16-gauge continuous hinges secured with rivets to door frame and to door. Hinge to have ½" knuckles and 0.235" diameter.
- D. Locker Door – One-piece, 14-gauge steel with both vertical edges formed into channel-shaped formation; top and bottom shall be flanged at 90-degree angle. The door includes a 7-1/2" wide full height 18 gauge pan reinforcement welded to inside

of door with peg board area for user supplied peg board style hooks. Two groups of 6 - 3-1/2" wide louvers located at bottom of door.

- E. Handles – Upper unit door recess handle to be Nickel plated, zinc alloy with a tensile strength of not less than 40,000 psi. No moving parts are to operate against outside surface of locker. Padlock attachment to be integral part of lift which shall be attached directly to the locking bar.
- F. Quiet Locking Device – Upper door locking device shall engage frame at three points. Channel shaped locking device with full length reinforcing ribs shall be a quiet design utilizing nylon guide inserts to reduce metal to metal contact. The locking device shall include a Zinc alloy latch finger with a nano roller at point of contact with the door jamb. Lock bar shall be enclosed on three sides and operate within the channel formation of the door. Locking device shall be pre-locking so mechanism can be locked in open position with door locking automatically when closed. Security box shall have one-point locking device with a 14-gauge lock clip for attaching padlock. Doors include lock-hole to permit use of built in key or combination lock.
- G. Electrical Cutout – 1-1/4" square cutout in each rear corner of top and shelves for electrical feed.
- H. Finish: Before enamel is applied, the surfaces of the steel shall be thoroughly cleaned and phosphatized in a seven-stage process. All parts shall then be finished with a heavy coat of enamel, baked on at 300° for 30 minutes.
- I. Color: Doors and exposed body parts shall be finished in colors selected from Republic's collection of twenty-five colors. Non-exposed body parts shall be finished as well.
- J. Provide necessary trim and filler pieces as required for complete installation.

3. PART 3 - EXECUTION

- 3.1 The lockers shall be installed on bases as shown and/or specified. Lockers shall be securely anchored to base and walls, in accordance with the manufacturer's written recommendations. All anchors and fasteners shall be galvanized or cadmium plated.

3.2 ADJUSTMENT

- A. Upon completion of installation, inspect lockers and adjust as necessary for proper door and locking mechanism operation. Touch up scratches and abrasions to match original finish.

◆ END OF SECTION ◆

SECTION 10 56 13
STORAGE SHELVING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Open manufactured shelving for general storage.

1.2 SHOP DRAWINGS

- A. Submit shop drawings of each product specified herein showing sizes, quantities, and locations, load limits, as well as details of construction and installation. Do not fabricate any product until shop drawings are approved and colors selected.

2. PART 2 - PRODUCTS

2.1 OPEN METAL SHELVING

A. Materials

- 1) Steel Sheet: ASTM A 366 matte finish, suitable for exposed applications, and stretcher leveled or roller leveled to stretcher leveled flatness.

- B. Shelving Units: Provide open shelving consisting of posts, shelves, and connectors of size, material, and assembly to comply with MH 28.1 for the following evenly distributed shelf load:

- 1) Shelf Capacity: 50 pounds per square foot.

- C. Shelving Unit Bracing: Manufacturer's standard single or double diagonal cross bracing at back and ends, as required for stability and load-carrying capacity.

- D. Shelves: Adjustable over the entire height of the post and as follows:

- 1) Solid steel sheet as indicated, of thickness required for shelf loading capacity.

- E. Posts: Fabricated from 0.0677 inch thick, cold-rolled steel; in manufacturer's standard shape; with perforations at 1½ inches o.c. to receive shelf-to-post connectors.

- 1) Post Base: Steel foot plate, adjustable, and drilled for mechanical attachment to floor.

- F. Shelving shall be Lyon 8000 Series or equals by Val Tec (#VT400 Series) or Broadhead Garret.

- G. See floor plans and casework legend for locations and dimensions.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install to manufacturer's recommendations.
- B. 18"D freestanding units shall be anchored to the wall.

◆ END OF SECTION ◆

WALL-MOUNTED STANDARDS AND SHELVING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Fixed slat wall display panel system that includes:

- 1) Recessed standards
- 2) Support channels
- 3) End trim
- 4) Panel supports
- 5) Wall system hardware
- 6) Plastic laminate pre-finished wall panels
- 7) Brackets
- 8) Glass shelves

B. Slat wall system to be located in Camp Store 101, as shown on drawings.

1.2 RELATED SECTIONS

A. Casework – Section 12 30 00

1.3 SHOP DRAWINGS

A. Submit shop drawings of each product specified herein showing sizes, quantities, and locations, as well as details of construction and installation. Do not fabricate any product until shop drawings are approved and colors selected.

1.4 WARRANTY

A. Manufacturer shall furnish a single written warranty covering both material and workmanship for a period of one (1) full year from date of substantial completion.

2. PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Basis of design for panel system is Pazwall Fixed Panel Recessed Standard System, by Paz Systems Inc. 607 Albany Ave., North Amityville, NY 11701; Telephone: 631.420.5959; Email: sales@pazsystems.com, or approved equal by Marlite, Storewall, or custom fabrication.

B. Basis of design for brackets shall be Reeve Store Equipment Co., or approved equal by Garco or Knappe & Vogt.

- 1) Verify brackets are compatible with panel system.

2.2 COMPONENTS

- A. Support Channel (1SC)
 - 1) Material: 22-gauge Steel
 - 2) Finish: Galvanized
 - 3) Size: 2-3/4"W x 126"L x 7/8"D
- B. Display Recessed Standard (2FP)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Mill, Black Anodized, Powder Coat
 - 4) Slotting: 1/2"-1" On Center, 1"-2" On Center
 - 5) Size: 3-1/8"W x 96"/120"/144"L x 1-1/8"D
- C. Display Recessed End Standard (2FP3)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Bright Dipped, Black Anodized, Powder Coat
 - 4) Slotting: 1/2"-1" On Center, 1"-2" On Center
 - 5) Size: 2"W x 96"/120"/144"L
- D. End Trim (3FP)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Bright Dipped, Black Anodized, Powder Coat
 - 4) Size: 2"W x 96"/120"/144"L
- E. Panel Support (4FP)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Mill
 - 4) Size: 1-5/8"W x 96"/120"/144"L
- F. Dual Panel Support (6FP)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Mill
 - 4) Size: 3-1/8"W x 96"/120"/144"L
- G. Bottom Channel – Lip (5LB)
 - 1) Material: Aluminum
 - 2) Panels: 1/4", 5/8", 3/4"
 - 3) Finish: Bright Dipped, Black Anodized, Powder Coat
 - 4) Size: 1-7/8"W x 120" x 1-1/8"D

H. Bottom Channel – No Lip (5B)

- 1) Material: Aluminum
- 2) Panels: 1/4", 5/8", 3/4"
- 3) Finish: Mill
- 4) Size: 2"W x 120" x 1-7/8"D

I. Top Channel (5T)

- 1) Material: Aluminum
- 2) Panels: 1/4", 5/8", 3/4"
- 3) Finish: Bright Dipped, Black Anodized, Powder Coat
- 4) Size: 1-5/8"W x 120" x 1-1/4"D

J. Wall System Hardware

- 1) K4 System Fasteners (number 10x5/8)
- 2) K5 Teck Screws (number 8x1/2)
- 3) K2 Shim Stacks (25 per stack)
- 4) K8 Hold Down Clips
- 5) Consult manufacturer for correct hardware for project application and existing substrate.

K. Pre-Finished High Pressure Plastic Laminate Panels

- 1) Panels shall be constructed of 3/4" particleboard.
- 2) Finish all exposed edges.
- 3) Color shall be selected from Wilsonart Premium Laminates with Aeon Scratch Resistance and Linearity Finish.
- 4) See drawings for panel dimensions and locations.

L. Colors to be selected by architect.

2.3 BRACKETS AND SHELVES

- A. Provide (16) brackets and (8) glass shelves for each panel unit.
- B. Contractor to verify with manufacturers that brackets are compatible with Fixed Panel Recessed Wall Standards System.
- C. Brackets

- D. Basis of design shall be Reeve Shelf Bracket, part #742-12, or approved equal by Garco or Knappe & Vogt.
 - 1) Verify brackets are compatible with wall standards system.
 - 2) Application: For use with concealed/recessed/"T" standards and glass or wood shelves.
 - 3) Features: 1/8" thick tempered steel.
 - 4) Finish: Brillatone (Satin Zinc) or Polished Chrome
- E. Shelves
 - 1) Provide 7"D x 1/4" thick clear tempered glass shelves that are compatible with brackets.
 - 2) Provide a quantity of (8) shelves per panel unit.

3. PART 3 - EXECUTION

3.1 Consult with manufacturer for preparation and installation recommendations and instructions.

3.2 INSTALLATION

- A. Build template using (1) of the field standards provided by manufacturer and the template parts.
- B. Transfer center lines of the support channel onto the standards.
- C. Use the template and mark the bottom of main support channel on the wall.
- D. Snap a level line and install the main support channel above the line.
- E. Mark the center line of the standards on the main support channel.
- F. Transfer center line marks from the main support channel to the other support channels.
- G. Using the template as a guide, assemble the grid sections on the floor omitting the main support channel.
- H. Lift grid sections in place and attach the standards to the main support channel only.
- I. Plumb the first standard and attach all other support channels to each other, then the wall.
- J. Attach panel supports, end trims or end standards to the support channels.

- K. Attach top and bottom channels.
- L. Apply adhesive to standards, panel supports, end trims or end standards.
- M. Lift panels into place and down into position with a glass suction cup tool.
- N. Install temporary hold-on clips for 24 hours, remove them and discard.

3.3 GENERAL NOTES

- A. If Alternate 3 is accepted, system to be installed over cabinets and solid surface countertop (not behind).
- B. Follow manufacturer's instructions.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide and install appliances as shown on drawings and specified herein.
- B. Provide refrigerator and microwave in Kitchenette 107.

1.2 SUBMITTALS

- A. Submit product data and owner's manual for each product specified.

2. PART 2 - PRODUCTS

2.1 REFRIGERATOR

- A. Provide Energy Star-certified top freezer refrigerator, model GTE18GMNRES, as manufactured by GE, or equal by Whirlpool, Maytag, or Frigidaire. Color shall be slate, fingerprint resistant stainless steel.

1) Dimensions:

- a) Capacity: 17.5 cu.ft.
- b) Refrigerator Capacity: 13.49 cu.ft.
- c) Freezer Capacity: 4.03 cu.f.t
- d) Size: 28"Wx32.625"Dx67.4"H
- e) Weight: 165 lbs
- f) Standard Depth

2) Appearance:

- a) Cabinet Finish: Smooth
- b) Door Style: Contour
- c) Glass Shelves

3) Controls:

- a) Auto Defrost: Yes
- b) Location of Controls: Interior

4) Details:

- a) Freezer shelves: 1 (adjustable)
- b) Ice Maker: No
- c) LED Light

2.2 MICROWAVE

- A. Provide model GCST10A1WSS, as manufactured by GE, or equal by Whirlpool, Maytag, or Frigidaire. Color shall be stainless steel.

1) Dimensions:

- a) Capacity: 1.0 cu.ft.
- b) Unit Capacity: Mid-Size
- c) Size: 20.60"Wx16.60"Dx11-7/8"H

2) Appearance:

- a) Case Color: Black
- b) Color Appearance: Stainless Steel
- c) Door Color: Stainless Steel
- d) Installation: Countertop (shall be installed in wall cabinet – coordinate with casework fabricator)

3) Power / Ratings:

- a) Electrical Input – 120V Amperage: 12.0
- b) Electrical Input – 120V Watts: 1500
- c) Electrical Requirements: 120V
- d) Hertz: 60

4) Controls:

a) Control Features:

- [1] Air Fry
- [2] Time Cook I and II
- [3] Child Lock-Out
- [4] Cooking Complete Remidner
- [5] Start/Pause
- [6] Cancel/Off
- [7] Timer On/Off
- [8] Clock – 12 HR
- [9] Add 30 Seconds
- [10] Auto and Time Defrost
- [11] Express Cook – Instant On 1-6 minutes
- [12] Auto Cook

b) Control Type:

- [1] Pushbutton
- [2] LED
- [3] Electronic Touch

- c) Convection Cooking Controls:
 - [1] Broil (Grill)
 - [2] Convection Cook
 - [3] Combination Cook
- d) Cooking System: Turntable
- e) Cooking Technology: Microwave/Convection/Air Fry
- f) Display Screen Size: 2.45
- g) Display Type: LED
- h) Electronic Digital Display with Clock: Yes
- i) Interior Lighting: Incandescent
- j) Microwave Oven Interior: Stainless Steel

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Follow manufacturer's recommended installation instructions.

3.2 CLEANING

- A. Upon completion of installation remove all waste materials, tools and equipment.
- B. Thoroughly clean the entire floor surface to the architect's satisfaction.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Casework manufactured with plastic laminate facing.

1.2 RELATED SECTIONS

- A. 06 60 00 Plastic Fabrications
 - 1) Provide solid surface countertops.
- B. 09 65 00 Resilient Flooring
 - 1) Install resilient base in all toe kicks.
- C. 10 56 13 Storage Shelving
- D. 10 56 17 Wall-Mounted Standards and Shelving

1.3 QUALITY ASSURANCE

- A. Casework Grade: Provide plastic laminate faced casework complying with the referenced quality standard and the following grade:
 - 1) Grade: custom.

1.4 SUBMITTALS

- A. Submit shop drawings showing general arrangement of the equipment, required mechanical and electrical connections, and details for construction of the custom-fabricated equipment.
- B. Submit brochures containing manufacturer's illustration sheets covering all manufactured items under this Contract.

1.5 GUARANTEE

- A. This Contractor shall furnish a written guarantee to the Owner warranting that the materials, workmanship and equipment for the entire installation are first class in every respect, and that he will replace any new equipment which becomes defective, except that which becomes defective due to misuse or abuse of the equipment, within one calendar year from the date of substantial completion. This Contractor shall replace any new equipment, which becomes defective during the guarantee period without cost to the Owner, compensating the other trades (mechanical, electrical, etc.) for any work necessitated by such replacement.

2. PART 2 - PRODUCTS

2.1 TYPES AND LOCATIONS

- A. Contractor shall refer to the drawings for locations and types of equipment units required. The Casework Legend is located on drawing A900.3.

2.2 MANUFACTURERS

- A. The basis of the drawings and these specifications are Stevens Advantage with door edging profile 3-mil radius edge, chrome, wire and five knuckle hinges. All cabinets to have high pressure laminate exterior.
- B. Equal casework by the following manufacturers is also approved:
 - 1) Carters Custom Millwork
 - 2) Case Systems
 - 3) LSI
 - 4) Riceland Cabinet Corporation
 - 5) Rivereast Custom Cabinets
 - 6) Southern Cabinetry
 - 7) Spyker Specialty Millwork
 - 8) Walbridge Woodworks
- C. Manufacturer substitution requests must be received at least 10 days prior to the bid date. Detailed specifications and a brochure illustrating each item of equipment they propose to substitute for the equipment scheduled must be provided.

2.3 MATERIALS

- A. Plastic laminates, provide one of the following:
 - 1) High pressure decorative laminate complying with NEMA LD3, Grade GP-28.
 - 2) High pressure decorative laminate complying with NEMA LD3, Grade CL-20.
 - 3) High pressure decorative laminate complying with NEMA LD3, Grade BK-20.
- B. Edge Banding for Plastic Laminate: Rigid PVC extrusions, through color with satin finish, 3mm thick at doors and drawer fronts, 1mm thick elsewhere.

- C. Melamine Faced Particleboard: Medium density particleboard complying with ANSI A208.1, Grade M-2, with decorative surface of thermally fused, melamine impregnated web complying with ALA 1992.
- D. Particleboard: ANSI A208.1, Grade M-2.
- E. Hardboard: AHA A135.4, Class 1 tempered.
- F. Locks shall be SA-402, 6 tumbler dead bolt
 - 1) Provide locks on all cabinets, unless noted otherwise.
 - a) In Camp Store 101, provide locks at check desk only.
 - b) No locks to be provided in Office 116.
- G. Pulls shall be 128 mm.
- H. All toe kicks shall be complete with horizontal and vertical filler.
- I. Grain Direction for Wood Grain Plastic Laminate:
 - 1) Vertical on both doors and drawer fronts, with continuous vertical matching.
 - 2) Vertical on end panels.
 - 3) Vertical on knee-space panels.
 - 4) Side to side on horizontal surfaces.
 - 5) Horizontal on aprons.

2.4 PLASTIC LAMINATE CASEWORK CONSTRUCTION

- A. Dimensions are the minimum.
- B. See table below:

	CORE	SURFACE	EDGE	CONSTRUCTION / JOINERY	HARDWARE
Cabinet Boxes - Base and Wall					
- Exposed vertical surfaces	<u>All front and sides:</u> 3/4" particleboard <u>Base bottom:</u> 3/4" plywood	GP28	Finish all exposed edges (including wall cabinet top and	Doweled and glued under pressure	

	CORE	SURFACE	EDGE	CONSTRUCTION / JOINERY	HARDWARE
	<u>Wall top and bottom:</u> 1" particleboard <u>Back:</u> entrapped - 3/8" particleboard or 1/4" tempered hardboard		bottom with 1mm PVC)		
- Semi-exposed parts (interior of open cabinets, not including drawer bodies)		CL20			
- Concealed surfaces		CL20			
- Panel ends		GP28			
Countertops (wet areas)	Phenolic resin particleboard	GP50 Balanced with backing sheet	Post form	Apply low-VOC silicone sealant to joint between HPL top and backsplash Field joints >48" apart and >48" from end of top	
Countertops	1-1/8" particleboard	GP50	GP50 Post form	Apply low-VOC silicone sealant to joint between HPL top and backsplash	
Cabinet Doors	3/4" particleboard	GP28 with CL20 liner on back	3mm PVC		Heavy duty, 5 knuckle, 2-3/4" institutional type hinge or Hettich Selecta Top 100 (no concealed hinges)

	CORE	SURFACE	EDGE	CONSTRUCTION / JOINERY	HARDWARE
Drawer Fronts	¾" particleboard	GP28 with CL20 liner on back	3mm PVC	Doweled and glued under pressure	128 mm design pulls
Drawer Sides and Backs	5/8" medium density fiberboard	Melamine on all visible surfaces with drawer in normal open position		Grass Zargen System	Combination epoxy coated steel and nylon roller bearing drawer slides Self-closing Full extension for file drawers
Drawer Bottoms	Fully captured MDF construction - Minimum thickness: 1/4" Platform construction – Minimum thickness: 1/2"	Particle-board.			Platform construction - must use wrap around drawer slide
Shelves	1" particleboard	GP28	1mm PVC on front and back edges	Multiple holes (minimum 5mm diameter at 1-1/4" O.C.)	

2.5 COMPONENTS

- A. Work surface: Plastic laminate countertop with grommets for cord access to electrical receptacles and computer ports below work surface. Grommets to be drilled in the field with locations coordinated with owner. Work surface would be placed at required height for specific tasks with knee space under it and structural supports to the floor.
- B. Provide stop chains where cabinet will be hitting another cabinet next or adjacent to.
- C. File drawer slide shall be a ball-bearing slide by KV, minimum 150 lbs full extension drawer.
- D. Provide finished and filler panels as shown and as recommended by the manufacturer.
- E. Provide top corner closure panels to conceal open spaces behind and between tall cabinets.

- F. Provide L-shaped support brackets at all mounted countertop locations. Quantity and location shall be as recommended by manufacturer to ensure proper support and prevent bowing over time.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Assemble and erect equipment, providing anchorage and attachments as required.
- B. Counter top cut outs shall be the responsibility of the General Contractor and coordinated with the cabinet supplier.
- C. In all locations where back and end-splashes meet walls, contractor shall apply low-VOC caulk.
- D. Repair damaged or abraded surfaces.
- E. Clean all equipment immediately prior to turning over to the Owner.
- F. Non-with-standing these specifications, all equipment and furniture shall be installed in strict accordance with the manufacturer's written recommendations.
- G. Perform finish work or replace damaged material in a satisfactory manner.
- H. Remove masking, excessive adhesive and sealants. Clean exposed surfaces with denatured alcohol.
- I. Protect installed fabrications with non-staining sheet coverings.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 DESCRIPTION

- A. Manually operated, roll-up fabric interior window shades including mounting and operating hardware.

1.2 REFERENCES

- A. NFPA 70 - National Electrical Code.
- B. NFPA 701-99 - Fire Tests for Flame-Resistant Textiles and Films.

1.3 SUBMITTALS

- A. Product Data: Manufacturer's data sheets on each product specified.
- B. Shop Drawings: Plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work.
- C. Window Treatment Schedule: For all roller shades. Use same room designations as indicated on the Drawings, field verified window dimensions, quantities, type of shade, controls, fabric, and color, and include opening sizes and key to typical mounting details.
- D. Selection Samples: For each finish product specified, one complete set of shade cloth options and aluminum finish color samples representing manufacturer's full range of available colors and patterns.
- E. Maintenance Data: Methods for maintaining roller shades, precautions regarding cleaning materials and methods, instructions for operating hardware and controls.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver window shades until building is enclosed and construction within spaces where shades will be installed is substantially complete.
- B. Deliver products in manufacturer's original, unopened, undamaged containers with labels intact.
- C. Label containers and shades according to window shade schedule.

2. PART 2 – PRODUCTS

2.1 MANUFACTURERS

- A. Basis of Design: Draper, Inc., 411 South Pearl Street, Spiceland, Indiana 47385-0425; Phone 765-987-7999.
- B. Or equals by Hunter Douglas, Levelor, and MechoShade.

2.2 MANUAL OPERATED SHADES

- A. Manually Operated Spring Roller Shade: Manually operated, vertical roll-up, fabric window shade with components necessary for complete installation; Spring Roller Shades as manufactured by Draper, Inc.
 - 1) Operation: Spring roller operating mechanism with metal roller containing heavy duty spring with positive locking mechanism permitting shade to be stopped at each half turn of roller. Provide cord clasp and braided cotton cord attached to bottom shade slat. Spring sized by manufacturer to accommodate shade size. Provide roller idler assembly of molded nylon and zinc-plated steel pin.
 - 2) Roller Tube: Fabricated from extruded aluminum, galvanized steel, or enameled steel. Diameter, wall thickness, and material selected by manufacturer to accommodate shade type and size. Fabric connected to the roller tube with LSE (low surface energy) double sided adhesive specifically developed to attach coated textiles to metal. Adhesive attachment to eliminate horizontal impressions in fabric.
 - 3) Mounting Brackets: Plated stamped steel. Provide size compatible with roller size.
 - a) Mounted to jamb.
 - 4) Endcaps: Stamped steel with universal design suitable for mounting to ceiling, wall, and jamb. Provide size compatible with roller size.
 - a) Endcap covers: To match fascia color.
 - 5) Fascia: L shaped aluminum extrusion to conceal shade roller and hardware.
 - a) Attachment: Snaps onto endcaps without requiring exposed fasteners of any kind. Fascia can be mounted continuously across two or more shade bands. No notching is required.
 - b) Shape: Square Fascia Panel.
 - c) Finish: to be selected by architect from manufacturer's standard colors.
 - 6) Shade slat: Slat encased in heat seamed hem.

2.3 FABRIC

- A. Manufacturer: Mermet or equal.
 - 1) Fabric shall have a 3-4% openness factor.
- B. Fire rating: NFPA 701, both small- and large-scale tests.
- C. Antistatic treated.

2.4 Field verify dimensions prior to fabrication.

3. PART – EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

- A. Field verify dimensions prior to fabrication.
- B. Coordinate requirements for blocking and structural supports to ensure adequate means for installation of window shades.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install roller shades level, plumb, square, and true. Allow proper clearances for window operation hardware.

3.4 TESTING AND DEMONSTRATION

- A. Test window blinds to verify that operating components are functional. Correct deficiencies.
- B. Demonstrate operation of shades to Owner's designated representatives.

3.5 PROTECTION

- A. Clean blind assemblies and protect from damage from construction operations. If damage occurs, remove and replace damaged components or entire unit as required to provide units in their original, undamaged condition

◆ END OF SECTION ◆

SECTION 22 00 00
GENERAL PROVISIONS

1. **PART 1 - GENERAL**

1.1 SCOPE OF WORK

- A. Work under Plumbing includes all necessary work required to complete the Plumbing System as shown on drawings and as follows:
 - 1) All sanitary drainage as shown on drawings.
 - 2) Domestic hot water heating system.
 - 3) All cold, hot water, gas piping and required insulation. All valves, fittings, hangers, sleeves, etc., required for installing the aforementioned piping.
 - 4) All plumbing fixtures, and floor drains required as hereinafter specified and required to complete the aforementioned systems.
 - 5) All excavation, bedding and backfilling required for the Plumbing work.
 - 6) All other miscellaneous items of equipment, materials, piping, etc., as hereinafter specified, as shown on drawings or as required for the proper operation of equipment and piping system and as may be required for the completion of the project.
 - 7) All test, inspections and permits.

2. **PART 2 - PRODUCTS**

2.1 BACKFILL DESCRIPTION

- A. The bedding and backfill requirements listed in this Section represent a minimum requirement. If Local or State requirements are in excess of listed requirements, such requirements shall supersede.
- B. ALL EXCAVATION AND BACKFILL WORK SHALL COMPLY WITH REQUIREMENTS OF THE LATEST STANDARDS OF THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA).
- C. Provide excavation and backfilling for Plumbing Work. Backfill to finish grade or to levels suitable for finish grading.
- D. Refer to Section 22 05 00 for cutting and patching responsibilities.
- E. Coordinate routing of underground lines with the A/E to minimize disruption and damage to trees, shrubs, walks, drives, and other landscape features.
- F. Excavation, backfill, surface repair and traffic control within the public right-of-way shall be in accordance with governing agency rules and regulations. Pay

any fee associated with alteration of the roadway.

- G. Remove unusable or surplus excavated material from the site. Deposit any usable excavated material where directed by the A/E.
- H. Locate and touch existing underground utilities, if any, in the areas of Work. If utilities are to remain in place, provide adequate means of protection during earthwork operations. Should uncharted, or incorrectly charted, piping or other utilities be encountered during excavation, notify the A/E immediately for instructions before proceeding. Cooperate with all trades, Utility Companies and the Owner in keeping services and the facilities in operation.
- I. Excavation damage to, or interruption of service of, any underground utility shall be a liability of the Contractor, whether or not plotted on the Drawings. Promptly repair or replace all damage to any existing utility to the full satisfaction of the Utility Company, the Utility Owner and the A/E.
- J. All existing utility service piping, conduits, wiring, etc., which are uncovered, whether within or beyond the property lines, shall be suitably supported, protected and maintained in operation, and shall be protected against settlement when excavations are refilled.
- K. Coordinate timing of excavations where required by the Authority Having Jurisdiction or where otherwise specified herein.
- L. Provide pipe bedding for all sanitary sewer lines located outside of building.
- M. Provide pipe bedding for all sanitary sewer lines located below the floor slab.
- N. Obtain approval from the A/E for bearing conditions.
- O. Whenever, in the opinion of the A/E, the soil is unsuitable for supporting piping, provisions for proper foundations will be made and the Contract price will be adjusted accordingly.
- P. Contact the A/E to obtain copies of Soils reports, if available. Bidders are strongly urged to visit the site and investigate existing soil conditions themselves.
- Q. 11 months after Contract Completion, review the excavated areas and add any backfill as required due to settling, etc. Re-seed or re-sod as required.
- R. Contractor shall provide seed grass cover to reestablish landscape to existing conditions where disturbed by its Work. This includes replacement of existing plants, shrubs, and related items.
- S. Repair and restore plants, shrubs, trees, sodden areas, paving, streets, curbs, and walks to match existing in the area where excavations are made.
- T. Maintain seeded lawns not less than 11 months after Contract Completion and

add any backfill as required due to settling, etc. If seeded in non-growing season and not given full 11 months of maintenance, or if not considered acceptable at that time, continue the following growing season until an acceptable lawn is established, as determined by the A/E.

- U. Rock excavation is not anticipated. Contractor will be entitled to additional compensation for excavating any rock that is not indicated on the Contract Drawings or in available Soils Reports. Refer to available soil boring data.
 - 1) If rock or boulders are encountered, immediately stop all excavation. Notify the A/E, and submit a cost per cubic yard, over and above Base Bid, for excavation and backfill of rock areas. Rock excavation is defined as the excavation of any buried boulders and rock, in excess of 1/2 cu. yd. in volume, which requires the systematic drilling with jackhammer or use of other special equipment.
 - 2) All other excavation, including soft shale and similar sedimentary soil formations, shall be regarded as “earth” excavation, and shall be included in the Contractor’s Bid.
 - 3) Do not proceed with rock excavation without prior written authorization of the A/E.
 - 4) The use of explosives is expressly prohibited.
- V. Provide concrete encasement required for underground piping. Where required, concrete encasement shall extend 6 in. around piping or sleeve, for 1 ft. each side of footings or foundations, and up to footing bearing elevation. Backfill around piping encasement after concrete has properly hardened.
 - 1) All concrete shall be 3,000 PSI minimum and placed in accordance with applicable ACI Standards. Refer to Section 03 30 00.

2.2 Typical backfill conditions:

- 1) Piping where bedding is not specified or required by Code: Previously excavated material.
- 2) Piping below slab-on-grade floors and pavement: Crushed stone (ODOT Item 304), pea gravel, or coarse sand from 4 in. below piping to slab.
- 3) Other piping outside building: Pea gravel from 4 in. below piping to 12 in. minimum above pipe, then previously excavated material.
- 4) Piping under drives and parking lots: Pea gravel from 4 in. below piping to 12 in. minimum above pipe, then previously excavated material. If pipe is less than 2 ft. below grade to top of pipe, provide 6 in. concrete encasement.
- 5) Piping under footings and foundations: Provide concrete encasement.

B. Materials:

- 1) Crushed stone: (ODOT Item 304).
- 2) Pea gravel: 1/8 in. minimum to 3/4 in. maximum diameter.
- 3) Sand: Clean, dry, coarse or medium.
- 4) Washed gravel: 3/4 in. size.
- 5) Concrete encasement: Material conforming to Division 03 requirements.

C. Materials Prohibited from Being Used for Backfill:

- 1) Material containing large rocks (over 2 in.), building materials, masonry debris, cinders, rubbish, wood, or other material subject to decay.
- 2) Any material which may cause damage to piping.
- 3) Frozen earth.

3. **PART 3 - EXECUTION**

3.1 WORK SPECIFIED ELSEWHERE:

- A. This contractor is referred to the General Documents and applicable portions of Division 1 of the Specifications. The Instructions to Bidders, General Conditions, Supplemental General Conditions, Special Conditions, Addenda, Alternates, Ohio Building Codes, these Technical Specifications, together with the Contract and Proposal, comprise the Contract Documents for this contract.

3.2 INTENT OF DRAWINGS AND SPECIFICATIONS:

- A. Work covered by these specifications and accompanying design drawings shall include all labor, materials, equipment, and services necessary for, and reasonably incidental to, the complete installation of the mechanical systems for the project. Any additional material, labor, or electrical modifications in using equals or approved equals is the responsibility of this contractor.
- B. Drawings are diagrammatic in nature, designed to provide the contractor with a working knowledge of systems to be installed. Omissions of minor specialties, or minor modifications to lay-out due to exigencies of construction, shall not relieve the contractor of the responsibility of furnishing and installing all materials and work required to make the systems complete and operative.
- C. The drawings indicate required size and points of termination of pipes and ducts and suggest proper routes to conform to structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets, and it shall be the work of this contractor to make the installation in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep

openings and passageways clear without further instructions, or cost, to the Owner or Architect.

- D. The drawings shown, in general, where the pipes, ducts and equipment are to be located. This contractor shall check over all the drawings and details carefully. Location of duct work and equipment may not be changed without written approval by the Architect.
- E. Selection of equipment and fabrication of all elements including piping etc. shall meet space and service requirement of the project.
- F. Substitution of makes other than those specifically named in the specifications, and drawings, will be approved by the Architect for the following reasons only - that the materials proposed for substitution are equal to and/or superior to equipment named, in construction, efficiency and utility, and further that the equipment named in the specifications cannot be delivered to the job in time to complete the work in proper sequence to work of other trades, due to conditions beyond control of contractor. Any additional material and/or labor in using equals or approved equals is the responsibility of this contractor.
- G. To receive consideration, requests for substitutions must be accompanied by documentary proof of equality of difference in price and delivery, if any, in form of certified quotation from suppliers of both specified and proposed equipment.
- H. In case of difference in price, the Owner shall receive all benefits of the difference in cost involved in any substitution and the contract altered by change order to credit Owner with any savings so obtained.
- I. Consult all drawings, Architectural, Structural, Mechanical & Electrical. Refer any discrepancies to the Architect before bid due date, - otherwise, corrections shall be made at expense of this contractor.

3.3 CODES AND STANDARDS:

- A. All materials and workmanship shall meet, in minimum, applicable provisions of State and Local Codes and Regulations governing the work. Where plans or specifications call for work or materials exceeding minimum standards, the plans and/or specifications shall apply.
- B. In the event any work shown or indicated on the drawings or in the specifications requires modification, or additions, to meet applicable Codes, the Contractor shall notify the Architect and obtain clarification before proceeding with the work.
- C. Contractor shall secure and pay for all notices, local permits and inspections required under applicable Codes and Regulations, including final Certificates of Approval, and shall pay all fees for same. The Plumbing Contractor will secure the State Plumbing Permit.

3.4 REFERENCE SYMBOLS:

A. Symbols for various references used herein include:

1)	A.G.A.	American Gas Association
2)	A.W.W.A.	American Water Works Association
3)	A.S.H.R.A.E.	American Soc. of Heating, Refrigeration & A.C.Eng.
4)	A.S.M.E.	American Society of Mechanical Engineers
5)	P.D.I.	Plumbing - Drainage Institute
6)	C.I.S.P.I.	Cast Iron Soil Pipe Institute
7)	S.M.A.C.N.A.	Sheet Metal & Air Conditioning Contractors National Association, Inc.
8)	N.F.P.A.	National Fire Protection Association
9)	UL	Underwriters Laboratories, Inc.
10)	NEC	National Electrical Code
11)	A.N.S.I.	American National Standards Institute
12)	O.S.H.A.	Occupational Safety and Health Act

3.5 CUTTING AND PATCHING

- A. Openings, chases and recesses required for the proper installation of the plumbing system shall be provided by the General Contractor in new construction during the normal course of construction, subject to timely and accurate layout of all such spaces by this contractor.
- B. Any cutting of finished work, and/or patching required due to inaccuracies or tardiness on part of this contractor in layout shall be accomplished by the General Contractor at the expense of this contractor. Cutting of existing walls for new piping shall be accomplished by this contractor. No structural members shall be cut without the prior approval of the Architect's Field Representative, any such cutting shall be done in a manner directed by the Architects Field Representative. This contractor shall in no way alter work of other contractors or trades without authorization of the Architect.

3.6 PROTECTION AND CLEANING

- A. This contractor shall be completely responsible for adequate protection of all his materials and equipment during shipment, storage and on site, until final acceptance of the project by the Architect.

- B. In addition to the provisions and stipulations of the General Conditions, this contractor shall provide various types of protection as follows:
 - 1) Protect finished floors from chips and cutting oil by the use of metal chip receiving pan and an oil proof floor cover.
 - 2) Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
 - 3) Protect equipment and finished surfaces from paint drippings, insulation adhesive and sizing droppings, etc. by use of drip cloths.
 - 4) Protect existing construction where work is required to be performed in same.
- C. During the course of construction, this contractor shall maintain his materials, equipment, etc. in a neat and orderly manner and maintain the work spaces as clean as possible consistent with the conditions under which the work is to be conducted.
- D. During the course of construction, cover and otherwise protect all mechanical and plumbing equipment and insulation from damage, dirt, plaster, water, etc. This contractor shall be responsible to repair and/or replace all damaged mechanical equipment and materials.
- E. At the time of completion, this contractor shall clean thoroughly all the apparatus and equipment furnished by him.

3.7 EXCAVATION AND BACKFILL

- A. This contractor shall do all excavating of any material encountered as shown or as necessary for the installation of underground sewers, drains, piping and equipment in his contract. Provide and maintain bracing, shoring or sheathing necessary to support the walls of excavation. Excavating and backfilling beyond 5'-0" outside the building line will be by the General Contractor unless noted otherwise.
- B. This contractor shall bed all underground lines.
- C. Where roots of live trees encountered in excavations, they shall be carefully protected during construction.
- D. Provide and operate pumping equipment as necessary to keep trenches and other excavation free of water.
- E. After insulation and test of piping and equipment has been completed, backfill over all lines. Tamp backfill.
- F. Backfilling material for all trenches within the walls of the building and under drives and parking areas shall consist of grits or bank run sand. Backfilling materials

removed from the excavation may be reused, if suitable and free from rubbish and organic matter.

- G. Exercise special care in backfilling trenches in which sewers are laid to guard against disturbing the joints. Such backfilling shall be placed evenly in 6" layers and carefully tamped under and around the pipe. Puddling with water will not be permitted until the backfill has been placed and tamped to a point 24" above the top of the pipes. Above this point backfill shall be placed and tamped in 12" layers.
- H. Remove and dispose of any material not used for backfill.
- I. Where excavation is necessary in existing pavements, the contractor for whose work the excavation is required shall pay in fees and costs of opening street or pavement and all costs of filling and repaving in accordance with requirements of an to the satisfaction of the Municipality, Utility or other owner of such paving.
- J. Where new lines are installed, exterior of the building, in paved area, this contractor shall cut pavement and excavate for the Mechanical Contractor and backfill same as soon as this contractor has completed installation of his work.
- K. Where excavation is necessary in an existing lawn, carefully remove and store sod. After backfilling trench, replace sod or apply top dressing of black dirt and seed to match existing lawn.
- L. This contractor shall excavate for all sanitary lines inside and outside of the building lines. This Contractor shall patch any paving and/or walks which are cut.

3.8 CONSTRUCTION DRAWINGS (AS BUILT DRAWINGS)

- A. The Contractor shall keep an accurate record of all deviations from contract drawings and specifications. He shall neatly and correctly enter, in colored crayon, any deviations on drawings affected and shall keep drawings available for inspection. Extra set of drawings will be furnished for this purpose.
- B. Record all changes showing:
 - 1) Size, type, capacity, etc. of any material, device or piece of equipment.
 - 2) Location of any device or piece of equipment.
 - 3) Location of any outlet or source in building service system
 - 4) Routing of any piping, conduit, sewers or other building services.
- C. These drawings shall also record the location of all concealed piping, conduit and other piping, by indication of measured dimensions to each such line from readily identifiable and accessible walls or corners of the building.

- D. These drawings shall be kept clean and undamaged and shall not be used for any purpose other than recording deviations from working drawings and exact locations of concealed work.
- E. After the project is completed, these sets of drawings shall be delivered to Architect, in good condition, as a permanent record of the installation as actually constructed.

3.9 SHOP DRAWINGS (SUBMITTALS)

- A. As soon as practicable, within 30 days after award of Contract, and before any materials, equipment or accessories are manufactured, the Contractor shall submit to the Architect for approval a minimum of five (5) copies, or sets, of shop drawings and detailed data describing all equipment he proposes to install. The equipment proposed for installation shall be in accordance with the provisions of these specifications and accompanying drawings. The submitted shop drawings shall include the names describing the equipment. The submitted shop drawings must be marked to indicate the type and/or catalog number and must be marked with the designating symbol and/or mark number used on the plans or in the specifications for each item.
- B. Approval of materials will be based on the manufacturers published ratings or certified drawings. All materials of like kind shall be one manufacturer.
- C. The Contractor shall examine all shop drawings and shall signify on the same that he has approved the equipment as acceptable according to the specifications and has approved the use of the equipment for space requirements of the project.
- D. Any equipment that requires a color selection shall have a color sample - metal - sample - submitted with the shop drawings, or provide the Architects office metal color samples for use of color selection in advance of shop drawing submittals.

3.10 TESTS AND ADJUSTMENTS

- A. This contractor shall furnish all required labor, materials and equipment and perform all tests required under applicable Codes for all mechanical systems.
- B. Where non-adjustable drive sheaves are provided with the equipment, this contractor shall be responsible for furnishing and installing the replacement sheaves required to balance the system.
- C. In the event leaks are observed, repairs or replacement shall be made and system retested.
- D. All systems shall be finally adjusted, all damaged goods replaced all repairs made, finally leaving all mechanical systems in clean complete, efficient operating order.

3.11 GUARANTEE AND WARRANTY

- A. This contractor shall guarantee all work installed by him, or his subcontractors to be free from defect in material and workmanship for a period of one year following the date of final acceptance of the work, unless a longer period is stipulated under specific headings, and he shall repair or replace - at no additional cost to the Owner - any material or equipment developing defects and shall also make good any damage caused by such defects or the correct of defects.
- B. This contractor shall submit his own and each equipment manufacturer's written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications.
- C. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment. Deviations from this may occur on larger items of equipment used during the beneficial occupancy before the total system is accepted, shall be made a matter of written record by the Architects Representative, in agreement with the authorized representative of the Owner.

3.12 WORKMANSHIP

- A. All work shall accomplished by mechanics skilled in the particular trade involved. Proper provision shall be made on all piping for expansion and contraction, using right angle loops, swing joints, or an approved type of expansion joints, whether the same as shown on drawings or not. Pipe shall be sloped to drain and installed parallel to adjacent walls. Contractor shall furnish and install all necessary valves, air vents, automatic devices and other specialties required to make the system complete whether the same is shown on the drawings or not.

3.13 VISITING THE SITE

- A. This contractor shall visit the site of the proposed work and shall familiarize himself with all conditions under which the work must be performed. He shall verify all data relative to location and size and capacity of new and/or existing utilities and determine the specific requirements of utility involved and shall include in his bid all materials and equipment required by such utility.

3.14 SUPERVISION OF WORK

- A. This contractor shall have in charge of the work, at all times during construction, a competent superintendent experienced in the work to be installed under this contract.

3.15 CONFERENCE PRIOR TO START OF WORK

- A. Immediately upon the award of Contract and before any work is started, the Contractor shall meet and confer with the Architect concerning the work under this Contract.
- B. Check with Project Architect as to time and place of meeting.

3.16 ADHERENCE TO REGULATIONS

- A. Give notices and comply with laws, ordinances, rules, regulations and orders of any public authority bearing on the work. If Contractor observes that Contract Documents are at variance with such in any respect, promptly notify Architect, in writing, necessary changes shall be adjusted by Change Order. If Contractor knowingly performs any work contrary to such without notice to Architect, he shall assume full responsibility therefore and shall bear cost attributable thereto.

3.17 RUBBISH

- A. All rubbish resulting from the work herein specified shall be removed from the premises as fast as it accumulates.
- B. On Completion of his work, this contractor shall remove from the site all tools, equipment, surplus materials, and rubbish pertaining to his own operations. Each Contractor shall pay all costs for such removal and disposition and shall perform final cleaning. Refer to contract for additional requirements.

3.18 REQUIREMENTS FOR FINAL INSPECTION

- A. All of the following items must be completed prior to final inspections. No exceptions will be made and no final payment will be made until all items are completed.
- B. Thoroughly clean all parts of the apparatus and equipment. Adjust and calibrate all controls and place system software in fully operating condition.
- C. Submit Operating Instructions, Service Manual and System Documentation, including all warranties.
- D. Complete all punch list items.
- E. Submit 'As-Built' drawings to Architect.

3.19 DAMAGE BY LEAKS

- A. This contractor shall be responsible for damage to the grounds, walks, roads, buildings, piping systems, electric systems and their equipment and contents, caused by leaks in the piping systems being installed or having been installed herein. He shall repair at his expense all damages so caused. All repair work shall be done as directed by the Architect.

3.20 EMERGENCY REPAIRS

- A. The Owner reserves the right to make emergency repairs, as required to keep equipment in operation without voiding the contractors' guarantee bond nor relieving the Contractor of his responsibilities during the bonding period.

3.21 INSPECTION AND FEES

- A. Tests for Plumbing Systems - Soil, waste, vent and water piping shall be tested by the Contractor and approved, before acceptance. Soil or waste piping located underground shall be tested before backfilling. Equipment required for test shall be furnished by the Contractor without additional cost to the Owner.
- B. Drainage Systems - Shall be tested as follows:
 - 1) Water Test - The entire drainage and venting system shall have all necessary openings plugged to permit the entire system to be filled with water to the level of the highest vent stack above the roof. The system shall hold this water for 30 minutes without showing leakage in piping.
 - 2) Where a portion of the system is to be tested, the test shall be conducted in the same manner, except that a vertical stack 10' above the highest horizontal line to be tested may be installed and filled with water to maintain sufficient pressure of a pump may be used to supply the required pressure. The pressure shall be maintained at 30 minutes.
- C. Air Test - If tests are made with air, a pressure of not less than 5 psig shall be applied with a force pump and maintained at least 15 minutes without leakage. A mercury-column gauge shall be used in making the air test.
- D. Final Test - The final test of the completed drainage and vent system may be either a smoke or a peppermint test. When the smoke test is employed, the smoke shall be produced by a smoke machine and a pressure equal to 1" water column shall be maintained for 15 minutes before starting inspection. When peppermint test is preferred, 20 ounces of peppermint shall be introduced into each line or stack. Defects discovered shall be eliminated by resetting the fixture and equipment with new gaskets.
- E. Hot and Cold Domestic Water Services - Shall be tested as follows:
 - 1) Upon completion of the roughing-in and before setting fixtures, the entire hot and cold water piping system shall be tested at a hydrostatic pressure of 1-1/2 times the actual working pressure but at less than 100 PSI gauge and proved tight at this pressure for not less than 30 minutes in order to permit inspection of all joints. Where a portion of the water piping system is to be concealed before completion, this portion shall be tested separately in a manner described for the entire system.
- F. Defective Work - If inspection or tests show defects, such defective work or material shall be replaced and inspection and tests repeated. Repairs or piping shall be made with new material. No caulking of screwed joints or holes will be acceptable. All tests shall meet with the approval of state and local inspections.

3.22 SAFETY REQUIREMENTS

- A. Contractor shall comply with OSHA requirements for physical hazards, safety equipment, fire fighting equipment and protective equipment.

3.23 PROHIBITED CONSTRUCTION

- A. There shall be no duct, water, waste, steam or condensate lines placed over electrical switchgear, transformers, or electric wall panels.

3.24 OPERATING INSTRUCTION MANUAL

- A. Submit one copy to the Architect for approval.
- B. After approval, submit three (3) copies to the Architect for delivery to the Owner.
- C. Bind the written operating instructions, shop drawings, equipment catalog cuts and manufacturer's instructions into a hardbacked binder where they can be accommodated into 8½ " x 11" size. Material to be assembled as follows:
 - 1) First Page - Title of job, school district, address, date of submittal, name and telephone number of Contractor, Subcontractors, and name of Engineer.
 - 2) Second Page - Index.
- D. First Section - A copy of each manufacturer's installation and operating instructions.
- E. Second Section - A copy of each approved shop drawing.
- F. Each section shall be identified with descriptive tabs.

3.25 PERSONNEL INSTRUCTION

- A. Provide total instruction to personnel selected by Owner for operation of building mechanical system. This is over and above specialized systems listed elsewhere in this specification. Instructions shall include the following:
 - 1) Show location of items of equipment and explain what they do.
 - 2) Refer to operating instruction manual for record and clarity.
 - 3) Coordinate written and verbal instructions so that each is understood by personnel.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 GUARANTEE

- A. Contractor shall guarantee its equipment, workmanship, and materials for a period of (1) year from the date of Contract Completion. Should defects develop within this period, the Contractor shall, at no cost to the Owner, remedy the defects and reimburse the Owner for all damage to other Work caused either by the defects or as a result of the work of correcting the same.
- B. Refer also to Division 01 and other Specification Sections that define the starting date of the guarantee period, or that discuss either additional warranty requirements, or extended equipment warranties beyond the standard period.
- C. In Drywall, Masonry, or Concrete Wall Construction:
 - 1) Option for above ceiling only: omit block(s) where required for penetrations, and shall provide square finished opening. Do not omit blocks under bearing points or in fire rated or smoke rated walls. Do not omit blocks in walls which serve as sound barriers.
 - 2) Provide openings through metal building walls and roofs, and seal watertight.
- D. In precast concrete work, in lieu of sleeves, cut holes after erection of concrete.
- E. Sleeve where pipes pass exposed through walls, and where any piping passes through smoke- rated or fire-rated separations, equipment room walls, or above-grade floors.
- F. If sleeves are not installed in construction, due to fault of the Contractor, holes through masonry or concrete construction shall be core drilled at the expense of the Contractor.
- G. Sleeves are not required in floor slabs on grade or in core-drilled openings not requiring water- proofing or firestopping. EXCEPTION: Sleeves are required at core drilling through hollow core pre-cast slabs and through concrete block walls, to facilitate containment of required firestopping material.
- H. Sleeving with absolutely watertight seal is required for piping passing through exterior walls above grade, and underground foundation walls and other below-grade penetrations into building.

2. PART 2 - PRODUCTS

2.1 DESIGN BASE MANUFACTURER STANDARD

- A. The Drawings and Specifications are based on the specific equipment requirements and configuration for a Design Base Manufacturer. Design coordination of equipment with the building and with other Trades has been made for this specific Model and Manufacturer of equipment. Where several Manufacturers are listed for an item of equipment or material, the first-named shall be considered the Design Base Manufacturer Standard.
- B. Consideration will not be given to any other Manufacturer that the Contractor proposes to use, unless the Manufacturer has been approved by the A/E and specifically named in the Contract Documents or Addenda thereto.

2.2 OTHER MANUFACTURERS

- A. No consideration will be given to any Manufacturer which the Contractor proposes as an "Approved Equal," unless the Manufacturer has been approved by the A/E during the bid period and specifically named in the Contract Documents or Addenda thereto.
- B. Recognizing that since no two Manufacturers are "identical," whenever the Contractor elects to furnish specified equipment or material manufactured by other than the Design Base Manufacturer, the Contractor shall be responsible for the cost and coordination of all modifications required to accommodate the elected equipment or material.
- C. Where deemed necessary by the A/E, the Contractor shall, at no additional cost to the Owner, prepare new layouts for these other brands of equipment which may have different dimensional or service requirements from the Design Base Manufacturer Standard. Submit these layouts to the A/E for review.
- D. Reimburse the A/E for the cost of any design changes incurred by the A/E in the preparation of revised Drawings or Specifications to accommodate the use of any Manufacturer other than the Design Base Manufacturer.

2.3 ALTERNATIVE MANUFACTURERS

- A. Contractor shall submit information on any proposed equipment or material that it desires to use as an Approved Equal.
- B. If the A/E determines an alternative Manufacturer to be acceptable, it will issue an Addendum adding that Manufacturer to the Specification.

2.4 EQUIPMENT SUITABILITY

- A. All equipment provided shall perform as intended. All items listed shall function properly, and as the Manufacturer intended. Install equipment according to the Manufacturer's recommendations. Properly attach equipment to the floor, wall, or structure. Each item of equipment shall be compatible with all other accessories or hook-ups, including piping, controls, wiring, and other equipment that are not furnished by the equipment Manufacturer, but that are required as an accessory or modification, as necessary to achieve its intended

function.

2.5 MISCELLANEOUS ACCESSORIES

- A. Provide any additional adapters, fittings, trim, structural steel angles, channels, Unistrut, brackets, etc., as necessary to securely mount and install all items of equipment specified or shown on the Drawings. All steel installed outside or exposed to moisture shall be hot-dipped galvanized.
- B. These accessories are required even though they may not be shown or detailed on the Drawings.
- C. Installation shall be compatible with the building construction on which the item is to be located.
- D. Verify the type of construction prior to ordering the equipment item, so that all required accessories are included.

2.6 QUANTITIES

- A. Equipment may be referred to in these Specifications, or on the Drawings, as either singular or plural; the Contractor shall verify the exact number of items required to complete its Work.
- B. No consideration will be given to any Manufacturer which the Contractor proposes as an "Approved Equal," unless the Manufacturer has been approved by the A/E during the bid period and specifically named in the Contract Documents or Addenda thereto.
- C. Recognizing that since no two Manufacturers are "identical," whenever the Contractor elects to furnish specified equipment or material manufactured by other than the Design Base Manufacturer, the Contractor shall be responsible for the cost and coordination of all modifications required to accommodate the elected equipment or material.
- D. Where deemed necessary by the A/E, the Contractor shall, at no additional cost to the Owner, prepare new layouts for these other brands of equipment which may have different dimensional or service requirements from the Design Base Manufacturer Standard. Submit these layouts to the A/E for review.
- E. Reimburse the A/E for the cost of any design changes incurred by the A/E in the preparation of revised Drawings or Specifications to accommodate the use of any Manufacturer other than the Design Base Manufacturer.

2.7 STANDARD SLEEVES

- A. Pipe sleeve material:
 - 1) Up to 8 in. diameter: Machine-cut Schedule 40 black steel pipe.

- 2) Bare copper piping: Copper sleeves.
 - 3) OPTION: In walls: Schedule 40 plastic pipe may be used for pipe sleeves, except where adjacent ceiling space is used for return air plenum.
- B. Sizing: Sleeves shall be large enough for insulation to be continuous, or for watertight or fire-rated sleeve seals to be installed. Size to allow 1/2 in. minimum clearance all around pipe or pipe insulation.

2.8 WATERTIGHT SLEEVE SEALS

- A. Oakum Caulking: With lead-pour or elastomeric sealant. Elastomeric sealant shall be 2 component, polysulfide or polyurethane.
- B. OPTION: Compression Seals: Stainless steel bolts and nuts. Provide correct size seal, and coordinate with sleeve size.
- C. Provide sleeves with waterstop anchor flange at midpoint where penetrating structure at or below grade.

2.9 FIRE-RATED SLEEVE SEALS

- A. ASTM E119 and E814 Silicone RTV foam, UL-approved.
- B. Plastic drain, waste, and vent stacks, and lines penetrating fire-rated floors, ceilings, and walls shall be fire-blocked and waterproofed using ProSet Systems, Inc., Series 45 or 55 couplings and Series 90 Code Red Firestop devices. All other plastic drain openings, such as closet stubs, and floor drains, shall be fire-blocked and waterproofed using ProSet Systems C, and E Z Flex flexible couplings.

2.10 PAINTING OF PLUMBING SYSTEMS

- A. Refer to Division 9 for painting specifics.
- B. Plumbing systems shall be painted to match adjacent finishes.

3. PART 3 - EXECUTION

3.1 PLUMBING SYSTEMS - COMMON REQUIREMENTS

- A. Install components with pressure rating equal to or greater than system operating pressure.
- B. Install all piping at right angles or parallel to the building walls. Diagonal runs are prohibited.

- C. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow 8" above removable ceiling panels to allow for panel and light removal.
- D. Install all piping specialties to meet manufacturer's requirements.
- E. Install unions in piping 2 inch and smaller adjacent to each valve and at final connection to each piece of equipment.
- F. Install flanges in piping 2-1/2 inch and larger adjacent to flanged valves and at final connections to equipment with flanged pipe connections.
- G. PVC piping will not be acceptable in return air plenums.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to facilitate service, maintenance, and repair or replacement of components.
- B. Maintain lubrication gaskets and packing during construction and assure that at time of acceptance by the Owner, equipment is in first-class operating condition.

3.3 DISINFECTING WATER LINES

- A. All domestic water lines shall be tested and disinfected to meet local health agency requirements before being placed into service.

3.4 TESTING AND REPAIR

- A. All piping systems shall be thoroughly cleaned and flushed prior to final testing.
- B. Pressure testing shall be completed for the following piping systems:
 - 1) Domestic hot and cold water.
 - 2) Sewer, soil, and waste water.
 - 3) Natural gas piping.
- C. All testing must be witnessed and accurately recorded noting methods of testing, times, dates, and results.
- D. Any damage as a result of tests shall be repaired or damaged materials replaced at no cost to the Owner.

◆ END OF SECTION ◆

GENERAL PLUMBING PIPING REQUIREMENTS

1. PART 1 - GENERAL

1.1 DISCRIPTION

- A. The following instructions apply to all piping systems, except where otherwise noted:
 - 1. Piping Drawings are schematic. Carefully coordinate final locations.
 - 2. Provide unions or flanges at each final connection and at each piece of equipment. Arrange piping, and locate unions and flanges, to permit easy removal of parts and equipment for inspection and cleaning. Welded connections to equipment are prohibited.
 - 3. Where connection size is smaller than piping, make reduction at final connection only. Do not reduce size of pipe drop. Arrange all piping in accordance with the best standards of the Trade, with vertical lines plumb, and horizontal runs parallel or perpendicular to the building walls.
 - 4. Provide valves and specialties as required. Install valves on each piece of equipment.
- B. If other means of draining are not provided, install drain valves at all low points to permit complete draining of each of the following systems:
 - 1. Domestic water system.
- C. Contractor shall provide information on chases, sleeves, and openings required for its Work to other trades. Contractor shall assume cost and responsibility for all cutting and patching resulting from improper coordination of its Work.

2. PART 2 - PRODUCTS

2.1 UNIONS

- A. In copper pipe: Bronze 150 lb. ground joint, solder end (do not use wrought copper unions).
- B. In steel pipe: Black malleable iron, 250 lb. bronze ground ball joint.
- C. Dielectric: Material shall be compatible for the type of service.

2.2 DRAIN VALVES

- A. Drain Valves: Milwaukee BA 100H or BA150H. 3/4 in. bronze hose-end ball valve, with cap and chain (where concealed).
- B. Other Acceptable Manufacturers: Approved equal by Walworth or Nibco.

2.3 JOINTS

- A. Flanged: Cast iron or cast bronze, 125 lb. or higher as required.
- A. Gaskets: Nonmetallic. 1/8 in. minimum thickness, fibrous type with double coat of graphite, asbestos-free, ASME B16.21, except use Type 304 stainless steel with carbon steel guide on high temperature piping systems. Use dielectric gaskets where joining dissimilar piping material.
- B. Bolts and Other Hardware:
 - 1. Bolts for steel, cast iron, brass, and bronze, for 250 lb. SWP, and for 450 deg. F. or below: Carbon steel, with American Standard regular, square heads and American Standard heavy-hexagon, semi-finished nuts.
 - 2. Where equipment is installed outside, all hardware and bolts shall be stainless steel.
 - 3. ASME B18.21, Tee head, high tensile steel bolts and nuts may be used in mechanical joint pipelines.
- C. Threaded piping: Use NPT tapered threads. (ASME B1.20.1.)
- D. Filler materials:
 - 1. Solder: Shall meet ASTM B32. Alloy Sn94 and Sn95 shall be used
 - 2. Brazing: Shall meet AWS A5.8
 - 3. Welding: Shall comply with AWS D10.12.
- E. Nipples:
 - 1. Solder: Shall meet ASTM B32. Alloy Sn94 and Sn95 shall be used
 - 2. Brazing: Shall meet AWS A5.8
 - 3. Welding: Shall comply with AWS D10.12.

3. PART 3 - EXECUTION

3.1 PLUMBING SYSTEMS - COMMON REQUIREMENTS

- A. Install components with pressure rating equal to or greater than system operating pressure.
- B. Install all piping at right angles or parallel to the building walls. Diagonal runs are prohibited.

- C. Install piping tight to slabs, beams, joists, columns, walls, and other building elements. Allow 8" above removable ceiling panels to allow for panel and light removal.
- D. Install all piping specialties to meet manufacturer's requirements.
- E. Maintain fire rating at fire wall penetrations through the use of approved fire sealant materials installed in pipe sleeve.
- F. Install unions in piping 2 inch and smaller adjacent to each valve and at final connection to each piece of equipment.
- G. Install flanges in piping 2-1/2 inch and larger adjacent to flanged valves and at final connections to equipment with flanged pipe connections.
- H. PVC piping will not be acceptable in return air plenums.

3.2 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

- A. Install equipment to facilitate service, maintenance, and repair or replacement of components.
- B. Maintain lubrication gaskets and packing during construction and assure that at time of acceptance by the Owner, equipment is in first-class operating condition.

3.3 DISINFECTING WATER LINES

- A. All domestic water lines shall be tested and disinfected to meet local health agency requirements before being placed into service.

3.4 TESTING AND REPAIR

- A. All piping systems shall be thoroughly cleaned and flushed prior to final testing.
- B. Pressure testing shall be completed for the following piping systems:
 - 1) Domestic hot and cold water.
 - 2) Sewer, soil, and waste water.
 - 3) Natural gas piping.
- C. All testing must be witnessed and accurately recorded noting methods of testing, times, dates, and results.
- D. Any damage as a result of tests shall be repaired or damaged materials replaced at no cost to the Owner.

◆ END OF SECTION ◆

GENERAL DUTY VALVES FOR PLUMBING PIPING

1. **PART 1 - GENERAL**

1.1 SECTION INCLUDES

- A. Valves

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting type materials, sizes, and dimensions.

1.3 QUALITY ASSURANCE

- A. American National Standards Institute (ANSI).
- B. American Society for Testing and Materials (ASTM).
- C. American Society of Mechanical Engineers (ASME).
- D. American Society of Sanitary Engineers (ASSE).
- E. Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).

1.2 MANUFACTURERS

- A. Nibco, Crane, Milwaukee or Watts
- B. Valve shall be of the same manufacturer throughout project.

2. **PART 2 - PRODUCTS**

2.1 COMPONENTS

A. BALANCING VALVES (2 IN. AND SMALLER)

- 1) 200 PSIG, ASTM B-62 bronze body/brass ball, threaded or solder joint ends, differential pressure read-out ports, 1/4 in. drain port, memory stop feature to allow valve to be closed for service and reopened to setpoint without disturbing balance position, and calibrated nameplates to ensure specific valve settings.
- 2) Acceptable Manufacturers: ITT Bell & Gossett CB Series, Nibco Fig. 1710, or Taco ACUF Series.

B. BALL VALVES (3 IN. AND SMALLER)

- 1) 150 lb. SWP, bronze body, threaded or solder joint ends, TFE seat and seals, stainless steel ball, blow-out-proof stem, extended handle with vapor seal, adjustable memory stop, and protective sleeve.
 - a) ONLY Acceptable Ball Valve Manufacturers: Milwaukee Model BA-100 or BA-150 or approved equal by Watts No. B-6000 or B-6001, Apollo 70-100 or 70-200, Hammond 8501 or 8511, Nibco 580-70 or 585-70, or Kitz 68 or 69.
 - 2) With Lockable Handles: 150 lb. SWP, bronze body, threaded ends, TFE seat and seals, stainless steel ball, extended handle with vapor seal, adjustable memory stop, and protective sleeve.
 - b) Acceptable Manufacturers of ball valves with lockable handles: Milwaukee Model BA-100 LD, Apollo No. 70-100-27, or Nibco 580-70-LH.
- C. CHECK VALVES
- 1) 2 in. and Smaller: Milwaukee Fig. 509 or 1509. 125 lb. SWP, ASTM B-62 bronze body, swing check, threaded or solder joint tubing ends, with renewable bronze disc and integral seat.
 - 2) 2-1/2 in. and Larger (swing): Milwaukee Fig. F-2974. 125 lb. SWP, iron body, bronze trim, with flanged ends.
- D. DRAIN VALVES
- 1) A. Milwaukee Fig. BA-100H or BA-150H (threaded or soldered ends). 3/4 in. bronze hose end ball valve, with cap and chain.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install all threaded valves with a union joint on the downstream side of the valve.
- B. Provide valves to isolate all equipment in accessible locations
- C. Provide valves of like material as the piping systems.
- D. Provide dielectric connections between all dissimilar metals.
- E. No valve shall be installed with stem pointing down below the horizontal without the approval of the Architect.
- F. Name of manufacturer together with the service and pressure markings shall be cast in the body.

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- G. Fixture stops shall be provided with each fixture and/or piece of equipment. Fixture stops shall be key-operated stops; except for fixture stops for flush valves, which shall be screwdriver stops with protective caps. Groups of fixtures shall be exposed.

◆ END OF SECTION ◆

HANGERS & SUPPORTS FOR PLUMBING PIPING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hangers, supports, and concrete inserts required for piping and equipment installed under Division 22 00 00.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting material, sizes, and dimensions.

1.3 QUALITY ASSURANCE

- A. All piping supports and parts shall conform to the latest requirements of the Code for Power Piping 9ANSI B31.1 and MSS Standard Practice SP-58 and SP-69.

1.4 MANUFACTURERS

- A. Grinnell, Mason, or Kinetics

2. PART 2 - PRODUCTS

2.1 HANGERS

- A. Insulated Piping:
 - 1) Steel or Copper
 - a) All sizes: Grinnell Fig. 260, adjustable clevis, carbon steel yoke, U-strap, bolt and hex nuts.
 - b) Hanger size must be sufficient to accommodate pipe without compressing the insulation.
 - c) All hangers shall be external of insulation.

2.2 SPRING HANGERS

- A. Light duty (250 lb. Max): Grinnell Fig. 247, all-welded construction, enclosed spring.
- B. Grinnell Fig. B268, Type A or B, adjustable pre-compressed variable spring, steel construction.

2.3 TRAPEZE HANGERS

- A. Unistrut or angle iron of sufficient length to support pipes and insulation on individual hangers, roller supports or saddles with insulation protectors; trapeze hanger rod diameter and quantity as required to support total piping load.

2.4 SUPPORTS

- A. Pipe hanger rod sizes shall be 3/8".
- B. Beam Clamps
 - 1) Grinnell Fig. 227, top beam clamp, steel jaw, hook rod with nut and spring washer steel eye-bolt.
 - 2) "C" Clamps: Grinnell Figs. 87, 92, 93, or 94, malleable iron body, steel pointed set screw with lock nut and retainer strap. Beam clasps by themselves (C-clamps) are expressly prohibited. Provide retainer straps with all beam (C-Clamps).
 - 3) Consult with MSS SP-58 and SP-69 for C-Clamp identification.
 - 4) Grinnell Fig. 60 steel washer plate and double nutted is used with threaded rod.
 - 5) Wall brackets: Grinnell Fig. 194 (light weight 750 lb. Load) or Fig. 195 (medium weight 1500 lb. Load), carbon steel, back plates and bolts.

2.5 INSERTS

- A. In concrete: Grinnell Type CB, Fig. 282, universal mounting, malleable iron construction, lateral adjusting.
- B. In precast concrete (2-inch pipe maximum): Grinnell Fig. 117, expansion case, interior standard pipe threads, external helical wedge, malleable iron construction.

3. PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Install necessary pipe hangers and supports to properly support all piping and to maintain piping uniformly level (3/4" maximum deflection). Hangers to be double nutted.
- B. Maximum spacing of piping supports to be as follows:

PIPE SIZE	STEEL PIPE	COPPER PIPE
3/4" or smaller	7'	5'
1"	7'	6'

- C. Install wall brackets where required.

- D. Support piping at equipment from floor, structure or walls, so that piping weight is not supported by equipment.

3.2 GENERAL INFORMATION

- A. Ceiling grid system shall not be used to support ductwork, electrical conduit, heating lines or any other utility lines. Each utility and the ceiling grid system shall be a separate installation and each shall be independently supported from the building structure. Where interferences occur, in order to support ductwork or piping, the Contractor must install trapeze type hangers or supports which shall be located where they do not interfere with access to fire dampers, valves, and other mechanical equipment items.
- B. Where necessary, the Contractor shall furnish and install proper angles or channels between joists for hanger supports. Weld to steel structural members.
- C. Avoid cutting concrete or masonry by using inserts. Use top flange beam clips to avoid burning metal deck.
- D. Furnish and install any intermediate supporting steel or supports, foundations, and concrete pads required for proper support of all piping and equipment.

◆ END OF SECTION ◆

IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Mechanical identification methods, materials and devices.

1.2 DESCRIPTION

- A. Identify by labels and tags the following items:
 - 1) Equipment such as pumps and similar items.
 - 2) Piping exposed in accessible service areas.
 - 3) Piping running above accessible ceiling construction.
 - 4) All valves.
- B. Install laminated plastic nameplates for equipment, color banding, flow arrows and contents identification for piping.

1.3 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, sizes, and dimensions for identification systems.
- B. Submittals are required of valve schedules.

1.4 QUALITY ASSURANCE

- A. Identification requirements shall meet ASME A13.1.

1.5 MANUFACTURERS

- A. Seton, Brady or MSI

2. PART 2 - PRODUCTS

2.1 EQUIPMENT NAMEPLATES

- A. Stencils: Standard stencils shall be black enamel on a white background or white enamel on a dark background.

2.2 PIPE IDENTIFICATION

- A. Pressure-Sensitive Pipe Markers: Preprinted, color-coded, vinyl type with permanent adhesive.
- B. Pipe Markers: Full band type.
- C. Plastic Tape: Color-coded, pressure-sensitive, self-adhesive vinyl.

- D. Any piping identification that becomes loose or falls off piping during warranty period shall be replaced by installing contractor.

2.3 VALVE IDENTIFICATION

- A. 2 inches diameter, 16 gauge, brass tag with brass chain. ¼" high stamped letters over ½" high stamped numbers, both black-filled.
- B. Concealed valve locations shall be indicated by color coded tags adhered to the ceiling T-bars.

2.4 PIPING IDENTIFICATION

PIPING IDENTIFICATION	
Stencil	Tag
Dom. Cold Water	D.C.W.
Dom. Hot Water	D.H.W.
San. Sewer	SAN.
Nat. Gas	N.G.

2.5 VALVE CHARTS

- A. Valve charts shall be furnished by this contractor and shall include the following items:
- 1) Valve identification
 - 2) Location
 - 3) Purpose
 - 4) Color coded tag legend
- B. Valve charts shall be included in the Maintenance and Operating Manuals.

3. PART 3 EXECUTION

3.1 INSTALLATION

- A. Piping, equipment and valve identification shall be completed prior to above ceiling inspection.
- B. Equipment tags shall be attached with screws, except where screws might damage equipment or ductwork, use compatible adhesive.
- C. Apply piping identification only after finish painting is completed.
- D. Provide service designations, flow arrow around color banding at 25-foot maximum intervals.

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- E. Identify piping at connections to equipment, at valves, at branches from main, at each riser and at both sides of wall or barrier through which pipe passes.
- F. Contractor shall clean piping insulation in area of labeling just prior to labeling of pipe insulation.
- G. Labels must be readable from a standing position.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Furnish and install all insulating materials and accessories as specified or as required for a complete installation. The following types of insulation are specified in this section:

- 1) Pipe Insulation
- 2) Equipment Insulation

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, thickness for each service or piece of equipment, aged thermal qualities, and accessories.

1.3 QUALITY ASSURANCE

- A. Fire performance characteristics in accordance with ASTM E 84 for flame spread of 25 and smoke developed of 50.
- B. Materials and installation in accordance with NFPA 255 and UL 723.
- C. ASHRAE Standard 90.1-1999

1.4 MANUFACTURERS

- A. Owens Corning, Johns-Manville, Schuller or Knauf.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Use composite insulation systems (insulation, jackets, sealants, mastics, and adhesives) that have a flame spread rating of 25 or less and smoke developed rating of 50 or less, with the following exceptions:
- B. Insulation which is not located in an air plenum may have a flame spread rating not over 25 and a smoke developed rating no higher than 150.
- C. All adhesives and sealants shall be low VOC.

2.2 INSULATION AND JACKETS

- A. SEMI-RIGID FIBERGLASS/MINERAL WOOL INSULATION:

- 1) Minimum nominal density of 3 lbs. per cu. ft., thermal conductivity of not more than 0.28 at 75 degrees F, minimum compressive strength of 125 PSF at 10% deformation, rated for service to 450 degrees F. Insulation fibers perpendicular to jacket and scored for wrapping cylindrical surfaces.
 - 2) White kraft reinforced foil vapor barrier all service jacket, factory applied to insulation with a maximum permeance of .02 perms and minimum beach puncture resistance of 50 units.
- B. FLEXIBLE ELASTOMERIC CELLULAR THERMAL INSULATION:
- 1) Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Grade 1, Type I for tubular materials.
 - a) AP Armaflex
 - b) Aeroflex USA, Inc.
 - c) K-Flex USA.
- C. FIREPROOFING INSULATION:
- 1) Mineral fiber with nominal density of 8 lbs. per cu. ft., flame spread index of 15, fuel contribution index of 0, and smoke developed index of 0, thermal conductivity of not more than 0.23 at 75 degrees F.
 - 2) Jacket material shall be the same as jacket for adjacent insulation.
- D. PVC FITTING COVERS AND JACKETS:
- 1) White PVC film, gloss finish one side, semi-gloss other side, FS LP-535D, Composition A, Type II, Grade GU. Ultraviolet inhibited indoor/outdoor grade to be used where exposed to high humidity, ultraviolet radiation, in kitchens or food processing areas or installed outdoors. Jacket thickness to be .02 inch (20 mil).
- E. INSULATION INSERTS AND PIPE SHIELDS:
- 1) Construct inserts with calcium silicate, minimum 140 psi compressive strength. Piping 12" and larger, supplement with high density 600 psi structural calcium silicate insert. Provide galvanized steel shield. Insert and shield to be minimum 180 degree coverage on bottom of supported piping and full 360 degree coverage on clamped piping. On roller mounted piping and piping designed to slide on support, provide additional load distribution steel plate.
 - 2) Where contractor proposes shop/site fabricated inserts and shields, submit schedule of materials, thicknesses, gauges and lengths for each pipe size to demonstrate equivalency to pre-engineered pre-manufactured product described above. On low temperature systems, extruded polystyrene may be substituted for calcium silicate provided insert and shield length and

gauge are increased to compensate for lower insulation compressive strength

- 3) Precompressed 20# density molded fiberglass blocks, Hamfab or equal, of same thickness as adjacent insulation may be substituted for calcium silicate inserts with one 1"x 6" block for piping through 2-1/2" and three 1" x 6" blocks for piping through 4". Submit shield schedule to demonstrate equivalency to pre-engineered/pre-manufactured product described above.
- 4) Wood blocks will not be accepted.

F. ACCESSORIES:

- 1) All products shall be compatible with surfaces and materials on which they are applied, and be suitable for use at operating temperatures of the systems to which they are applied.
- 2) Adhesives, sealants, and protective finishes shall be as recommended by insulation manufacturer for applications specified.
- 3) Insulation bands to be 3/4 inch wide, constructed of aluminum or stainless steel. Minimum thickness to be .015 inch for aluminum and .010 inch for stainless steel.
- 4) Tack fasteners to be stainless steel ring grooved shank tacks.
- 5) Staples to be clinch style.
- 6) Insulating cement to be ANSI/ASTM C195, hydraulic setting mineral wool.
- 7) Finishing cement to be ASTM C449.
- 8) Fibrous glass or canvas fabric reinforcing shall have a minimum untreated weight of 6 oz./sq. yd.
- 9) Bedding compounds to be non-shrinking and permanently flexible.
- 10) Vapor barrier coatings to be non-flammable, fire resistant, polymeric resin.
- 11) Fungicidal water base coating to be compatible with vapor barrier coating.

3. PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Leak test piping system before installing insulation systems.

3.2 INSTALLATION

- A. Install material in accordance with manufacturer's recommendations, in conformance with building codes and industry standards and "commercial and Industrial Insulation Standards."
- B. Do not insulate systems or equipment which are specified to be pressure tested or inspected, until testing, inspection and any necessary repairs have been successfully completed.
- C. Install insulation with smooth and even surfaces. Poorly fitted joints or use of filler in voids will not be accepted. Cover and seal exposed fiberglass insulation when insulation is terminated, no raw fiberglass insulation is allowed. Provide neat and coated terminations at all nameplates, uninsulated fittings, or at other locations where insulation terminates. Install with longitudinal joints facing wall or ceiling.
- D. Install fabric reinforcing without wrinkles. Overlap seams a minimum of 2 inches.
- E. Use full-length material (as delivered from manufacturer) wherever possible. Scrap piecing of insulation or pieces cut undersize and stretched to fit will not be accepted.
- F. Insulation shall be continuous through sleeves and openings. Vapor barriers shall be maintained continuous through all penetrations.
- G. Provide a complete vapor barrier for insulation on the following systems:
 - 1) Cold water (potable and non-potable)
 - 2) Equipment piping with a surface temperature below 65 degrees F

3.3 PIPING, VALVE, AND FITTING INSULATION

A. GENERAL:

- 1) Install insulation with butt joints and longitudinal seams closed tightly. Provide minimum 2" lap on jacket seams and 2" tape on butt joints, firmly cemented with lap adhesive. Additionally secure with staples along seams and butt joints. Coat staples with vapor barrier mastic on systems requiring vapor barrier.
- 2) Water supply piping insulation shall be continuous throughout the building and installed adjacent to and within building walls to a point directly behind the fixture that is being supplied.
- 3) Install insulation continuous through pipe hangers and supports with hangers and supports on the exterior of insulation. Where a vapor barrier is not required, hangers and supports may be attached directly to piping with insulation completely covering hanger or support and jacket sealed at support rod penetration. Where riser clamps are required to be attached directly to piping requiring vapor barrier, extend insulation and vapor barrier jacketing/coating around riser clamp

B. INSULATION INSERTS AND PIPE SHIELDS:

- 1) Provide insulation inserts and pipe shields at all hanger and support locations. Inserts may be omitted on 3/4" and smaller copper piping provided 12" long 24 gauge pipe shields are used.

C. FITTINGS AND VALVES:

- 1) Fittings, valves, unions, flanges, couplings and specialties may be insulated with factory molded or built up insulation of the same thickness as adjoining insulation. Cover insulation with fabric reinforcing and mastic or where temperatures do not exceed 150 degrees, PVC fitting covers. Secure PVC fitting covers with tack fasteners and 1-1/2" band of mastic over ends, throat, seams or penetrations. On systems requiring vapor barrier, use vapor barrier mastic.
- 2) The contractor to provide extensions for valve handles to accommodate insulation thickness.

D. ELASTOMERIC:

- 1) Where practical, slip insulation on piping during pipe installation when pipe ends are open. Miter cut fittings allowing sufficient length to prevent stretching. Completely seal seams and joints for vapor tight installation. For elastomeric insulation, apply full bed of adhesive to both surfaces. For polyolefin, seal factory preglued seams with roller and field seams and joints with full bed of hot melt polyolefin glue to both surfaces.

E. PROTECTIVE JACKETS:

- 1) Lap seams and joints a minimum of 2 inches and continuously seal with welding solvent recommended by jacket manufacturer. Lap slip joint ends 4" without fasteners where required to absorb expansion and contraction. For sections where vapor barrier is not required and jacket requires routine removal, tack fasteners may be used.

F. PIPE INSULATION SCHEDULE:

- 1) Provide insulation on new and existing remodeled piping as indicated in the following schedule:

Service	Insulation Types	Insulation Thickness by Pipe Size		
		1" and smaller	1.25" to 1.5"	2" and larger
Hot Water Supply	Rigid Fiberglass	1"	1"	1.5"
Cold Water	Rigid Fiberglass	0.5"	0.5"	1"
Cold Water (In-Wall)	Flex. Elastomeric	0.5"	0.5"	0.5"

- 2) The following piping and fittings are not to be insulated:

- a) Chrome plated exposed supplies and stops (except where specifically noted).
- b) Water hammer arrestors
- c) Piping unions and flanges for systems not requiring a vapor barrier.

3.4 EQUIPMENT INSULATION

- A. Do not insulate over equipment access manholes, fittings, nameplates or ASME stamps. Bevel and seal insulation at these locations:
- B. SEMI-RIGID FIBERGLASS:
 - 1) Apply insulation to equipment shells using weld pins, bonding adhesive, banded and wired in place. Fill all joints, seams and depressions with insulating cement to a smooth, even surface. Cover with reinforcing fabric and 2 coats of mastic. . Use vapor barrier mastic on systems requiring a vapor barrier.
- C. ELASTOMERIC:
 - 1) Apply full cover coat of adhesive to surface to be insulated, insulation and edge butt joints. Place insulation with edge joints firmly butted pressing to surface for full adhesion. Seal seams and joints vapor tight.
- D. EQUIPMENT INSULATION SCHEDULE:
 - 1) Provide equipment insulation as follows.

Equipment	Insulation Type	Thickness	Remarks
R.P.B.P.	Elastomeric	½"	Sheet type, pipe size type or combination of both. Fabricated for ease of removal and replacement when testing and servicing is required.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Domestic water piping

1.2 DESCRIPTION

- A. Connect to water service line above floor slab where shown on Drawings.
- B. Contractor shall provide site water service line.
- C. Provide a complete system of domestic hot water and cold water piping to fixtures and equipment where shown on Drawings.
- D. Sterilize complete domestic water system.
- E. Install backflow preventer on domestic water supply line where shown.
- F. Provide 3/4 in. valved branches on water service at point of entry into building, just past main backflow preventer and at the beginning of each branch, for injecting chlorine for sterilization.
- G. Test complete system

2. PART 2 - PRODUCTS

2.1 WATER PIPING

- A. Above Ground: Type "L" hard drawn copper tubing with wrought or forged copper solder fittings (ASTM B88).
- B. Piping in Earth and Under Slab:
 - 1) 2 in. and smaller: Type "K" soft copper (ASTM B88), wrought copper fitting, and brazed joints.
 - a) Acceptable Manufacturers: Clow "Super Bell-Tite" or approved equal by American Cast Iron Pipe Company or U. S. Pipe & Foundry.

2.2 SOLDER AND BRAZING ALLOYS

- A. Solder: 95-5 tin-antimony, lead free.
 - 1) Acceptable Manufacturers: Engelhard "Silvabrite 100," J. W. Harris Co. "Bridgit," or Oatey.

- B. Copper Brazing Alloys: Silver/phosphorous or silver/zinc alloys having a melting point greater than 1,000 deg. F. (ANSI B31.1 and AWS A58).
 - 1) Acceptable Manufacturers: Handy Harman Sil-Fos, Airco Welding Products Aircosil, or ESAB Allstate.
- C. Certify that solder and brazing used for entire piping system is lead-free.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Connect to water service line above floor slab where shown on Drawings.
- B. Provide a complete system of domestic hot water and cold water piping to fixtures and equipment where shown on Drawings.
- C. Sterilize complete domestic water system.
- D. Install backflow preventer on domestic water supply line where shown.
- E. Provide 3/4 in. valved branches on water service at point of entry into building, just past main backflow preventer and at the beginning of each branch, for injecting chlorine for sterilization.
- F. Test complete system

3.2 ARRANGEMENT AND ALIGNMENT OF PIPING

- A. In general, all piping shall be concealed in walls, furred spaces, pipe spaces, tunnels, or above suspended ceilings. Piping shall be installed parallel to building walls and at such heights as not to obstruct any portion of windows, doorways, stairways, pipe, tunnel or passageways. Where interferences develop in the field, pipe shall be offset or routed as required to clear such interferences. In all cases, consult architectural details before installing piping.
- B. All piping located in pipe spaces must be located so as to insure maximum accessibility.
- C. Piping shall be installed in a uniform manner parallel to walls or ceilings. All changes in direction shall be made with fittings. Horizontal piping shall be run at right angles to building lines.
- D. Piping shall be carefully installed to provide proper alignment, slope and expansion. Provisions shall be made to allow for expansion and contraction, pipe shall be guided and supported in such a manner that pipe lines shall not creep, sag, or buckle. Anchors and supports shall be provided wherever necessary to prevent misalignment of piping.

- E. Buried pipe shall be firmly bedded the full length each joint with the exception where bell holes are required. Where unstable soil conditions occur under buildings, support shall be made from the underside of the structural slab by an approved type hanging device embedded in the concrete.
- F. All exposed connections and run-outs to plumbing fixtures shall be brass pipe I.P. size, heavily chromium plated and polished.
- G. No piping shall be run over or within three (3) feet of electrical panels or switch gear.

◆ END OF SECTION ◆

SECTION 22 11 19
DOMESTIC WATER PIPING SPECIALTIES

1. PART 1 - GENERAL

1.1 GENERAL

- A. Provide plumbing piping specialties or accessories as shown or required to complete the installation of all plumbing systems installed on this Project.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, sizes, and dimensions.

2. PART 2 - PRODUCTS

2.1 THERMOMETERS

- A. Tterice "Industrial Type." Blue reading, organic liquid, 9 in. scale, cast aluminum, epoxy powder-coated case, front double-strength window, straight or adjustable angle pattern, brass separable well, range of 30 deg. F. to 180 deg. F. Provide insulation extension.
- B. Other Acceptable Manufacturers: Approved equal by Weiss, Ashcroft, Marsh, Weksler, Winters, or Marshalltown.

2.2 BACKFLOW PREVENTERS

- A. Watts Series 909M1QT-S. Reduced pressure dual checks, inlet and outlet bronze ball valves, with strainer, air gap drain funnel, line size.
- B. Other Acceptable Manufacturers: Approved equal by Ames Co., CMB Industries, Febco Backflow Preventers, Hersey Products, Conbraco Industries, or Watts Regulator Co.
- C. Backflow Preventer Manufacturer and Model shall be on the list of accepted equipment published by the U. S. Public Health Service.
- D. Note: Before ordering, obtain approval from the Local Water Utility for the specific type and model of backflow preventer to be used.
- E. Backflow preventers shall be serviceable without requiring removal from piping.
- F. Backflow preventers shall have a permanently attached plate indicating type and listing approvals.
- G. Provide ball valve ahead of strainer on inlet side of backflow preventer assembly.

2.3 SHOCK ABSORBERS

- A. Wade “Shokstops.” (ASSE Standard 1010, PDI-WH201) shock absorbers (water hammer arresters). Sizes as shown on the Drawings.
- B. SA-A: 3/4 in. pipe. ([1] to [11] fixture units.)
- C. SA-B: 1 in. pipe. ([12] to [32] fixture units.)
- D. SA-C: 1 in. pipe. ([33] to [60] fixture units.)
- E. Other Acceptable Manufacturers: Approved equal by Zurn, J. R. Smith.
- F. Provide shock absorbers at all locations as required to reduce water hammer.

2.4 STRAINERS

- A. Watts Model 777S. 1/2 in. to 3 in., Y-pattern, bronze body, threaded, #20 mesh stainless steel screen, 200 PSI WOG.
- B. Other Acceptable Manufacturers: Approved equal by Spirax/Sarco, Armstrong, or Hoffman.

2.5 PRESSURE GAUGES

- A. Weiss 4PGA-1. Standard single Bourdon tube, black die cast aluminum case, 4-1/2 in. diameter dial, chrome removable slip ring, gauge cock and pigtail, $\pm 1\%$ accuracy. Range shall be approximately 50% in excess of maximum pressure anticipated. Provide gauge cock.
- B. Other Acceptable Manufacturers: Approved equal by Trerice, Marsh, Weksler, Marshalltown, or Ashcroft.
- C. Provide spare gauge.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install each thermometer and pressure gauge so they may be read from floor.
- B. Provide pressure gauges at the following locations at inlet and outlet of the main reduced pressure backflow preventer
- C. Provide thermometer on the piping at water heater, on inlet and outlet of mixing valves, and on hot water recirculating pump suction line, where shown on Drawings.
- D. Install wall hydrants flush and level with building wall and generally 24 in. above finished grade. Confirm exact height with the Associate Architect.
- E. All products of the same type shall be by the same Manufacturer.

- F. Provide continuous back pressure type vacuum breakers on all lines to hose bibbs if not furnished with integral vacuum breaker.
- G. Provide shut-off valve ahead of each strainer and backflow preventer.
- H. Provide drain valve on each strainer drain. Extend to nearest floor drain.
- I. Provide ball valve on inlet and outlet connection of inlet connection to each hose bibb.
- J. Locate equipment backflow preventers below ceilings in area where spillage of water will not cause damage.
- K. Install backflow preventer at an accessible height
- L. After installation of backflow preventer, flush water supply line to remove debris. Clean out backflow preventer after flushing.
- M. Test backflow preventer at time of installation. A person or firm certified by the Ohio Department of Health shall perform the test and provide the testing equipment. Submit test report to the Associate Architect.
- N. Discharge from each reduced pressure backflow preventer shall have an open air gap. Indirect waste full size to nearest floor drain using steel or copper piping.
- O. Install ball valves and check valves on mixing valve inlets, if not integral.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide a complete system of interior low-pressure natural gas piping and valves for equipment, and provide final connection. Distribution system pressure shall be 7 in. water column.
- B. Connect below grade gas piping outside building where shown on site drawings.
- C. Extend and connect piping to gas-fired equipment where shown on Drawings.
- D. Extend and connect to building gas piping system where shown on Drawings.
- E. Provide equipment gas regulators, if needed, past the shut-off valve.
- F. Test complete system

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, sizes, performance ratings, and installation instructions.

1.3 QUALITY ASSURANCE

- A. Conformance to National Fuel Gas Code.
- B. Material and installation requirements shall follow NFPA 54, state and local gas company codes.
- C. Conformance to ANSI B31.
- D. Gas regulators shall be AGA rated.

2. PART 2 - PRODUCTS

2.1 UNDERGROUND GAS PIPING

- A. Black Steel: Schedule 40 wrought steel or wrought iron pipe and fittings (ANSI B36.10) butt-welded joints with backing rings, factory-coated with Scotchcoat 202 or Extru Coat, wrap fittings. Repair damaged coating by wrapping. Provide cathodic protection.
 - 1) Acceptable Manufacturers: JMF, ProTech Systems, Tyco Fire Products, or Wheatland Tube.
- B. Plastic Option: Nonflammable, thermoplastic gas pressure pipe and fittings (ASTM D2513 and ASTM 2683). Above ground riser shall be steel. Pipe and joints must be

approved by Gas Utility Company and Code Authority having Jurisdiction. Install with tracer wire (minimum #14 Type TW insulated copper) in conformance with Gas Utility Company Standards.

C. Acceptable Manufacturers:

- 1) Plastic underground piping: Appalachian Piping Products, Uponor Aldyl, Oil Creek, Phillips, Plexco, Charter, or Pyramid Industries.
- 2) Steel riser: Continental Industries, Perfection Corp., or Uponor.

2.2 Above Ground and in Building

- A. Above Ground and in Building: Standard weight, Schedule 40, welded, plain end, wrought steel pipe and fittings (ANSI B36.10), welded joints with backing rings. Threaded 125 PSI malleable iron fittings are permitted on piping 4 in. and smaller, if less than 5 PSI pressure, except in return air ceiling plenums, and where dropping in walls.

2.3 LUBRICATED PLUG VALVES (SEE OPTION FOR BALL VALVE)

- A. 1 in. to 2 in.: 150 lb. SWP (200 lb. WOG), semi-steel body, threaded ends with TFE stem seal and seat, square stem, and permanently attached lever handle.
- 1) Acceptable Manufacturers: Homestead Fig. 611, Powell Fig. 2200, Rockwell 142, or Nordstrom 142.
- B. 2-1/2 in. and Larger: 150 lb. SWP (200 lb. WOG), semi-steel body, flanged ends with TFE stem seal and seat, square stem, wrench-operated. Furnish wrench.
- 1) Acceptable Manufacturers: Homestead Fig. 612, Powell Fig. 2201, Rockwell 143, or Nordstrom 143.
 - 2) Each type of valve shall be by same Manufacturer.

2.4 BALL VALVES

- A. Refer to Section 22 05 23 for acceptable Manufacturers and Model numbers

2.5 BUTTERFLY VALVES (PERMITTED IN LIEU OF PLUG VALVES 2 IN. AND SMALLER)

- A. Milwaukee "Butterball," Model BB2-100. 175 lb. SWP, bronze body, viton seat, threaded ends, stainless steel disc and stem, and lever handle.
- B. Other Acceptable Manufacturers: Approved equal by Watts, Apollo, or Nibco.
- C. Each type of valve shall be by same Manufacturer.

1.2 ROOFTOP PIPE SUPPORTS

- A. Curb base shall be manufactured from recycled rubber and have a reflective stripe.

- B. Galvanized steel strut with extensions as required with attaching zinc plated rod, nuts and attaching hardware.

1.3 PAINTING

- A. Paint exposed, metal piping, valves, service regulators, service meters and meter bars, earthquake valves, and piping specialties, except components, with factory-applied paint or protective coating.
- B. Alkyd System: MPI EXT 5.1D.
 - 1) Prime Coat: Alkyd anticorrosive metal primer.
 - 2) Topcoat: Exterior alkyd enamel semigloss.
 - 3) Color: Gray.
- C. Damage and Touchup: Repair marred and damaged factory-applied finishes with materials and by procedures to match original factory finish.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Connect to outlet of gas meter regulator outside building. All concealed piping shall be welded.
- B. Extend and connect piping to gas-fired equipment where shown on Drawings.
- C. Extend and connect to building gas piping system where shown on Drawings.
- D. Provide equipment gas regulators, if needed, past the shut-off valve.
- E. All regulators shall be separately vented full size to the exterior, with a turndown elbow and insect screen. Vent outlet shall not terminate next to a combustion or fresh air intake.
- F. Provide a valve, union, and dirt leg at connection to each appliance. Lubricate all valves before putting the valves into service.
- G. Provide 1/2 inch elastomeric insulation around all piping in walls and through floors.
- H. Test all piping for 24 hours at 100 psi.

◆ END OF SECTION ◆

SECTION 22 13 16
SANITARY WASTE AND VENT PIPING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Sanitary waste and vent piping.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, sizes, and dimensions.

1.3 QUALITY ASSURANCE

- A. Follow manufacturer's requirements for installation.
- B. Comply with ANSI B31 pressure code for pressure piping.

2. PART 2 - PRODUCTS

2.1 PLUMBING PIPING

- A. Sanitary piping materials below slab
 - 1) Schedule 40 PVC with solvent joints per ASTM D2665, D2564, D2665. Cast iron hub and spigot per ASTM A74 and C 564. 2" minimum diameter
- B. Sanitary piping above finish floor.
 - 1) Schedule 40 PVC with solvent joints per ASTM D2665, D2564, D2665.
 - 2) Cast iron no hub and fittings per ASTM.
- C. Cleanouts: Floor cleanout, heavy duty cleanout with round scoriated C.I. non-tilt top, adjustable to finished floor, cast iron body, spigot outlet connection, brass plug with tapered head, adjustable housing. Provide with polished bronze cover for all floors without carpeting. Provide with carpet markers for carpeted floors. Wall cleanouts shall be concealed inside the wall with a polished chrome or stainless steel plate wall cover.
 - 1) Heavy duty cleanout with round scoriated C.I. non-tilt top, adjustable to Fin. Grade. Set in 1'-0" x 1'-0" concrete pad.

3. PART 3 - EXECUTION

3.1 ARRANGEMENT AND ALIGNMENT OF PIPING

- A. In general, all piping shall be concealed in walls, furred spaces, pipe spaces, tunnels, or above suspended ceilings. Piping shall be installed parallel to building

walls and at such heights as not to obstruct any portion of windows, doorways, stairways, pipe, tunnel or passageways. Where interferences develop in the field, pipe shall be offset or routed as required to clear such interferences. In all cases, consult architectural details before installing piping.

- B. All piping located in pipe spaces must be located so as to insure maximum accessibility.
- C. Piping shall be installed in a uniform manner parallel to walls or ceilings. All changes in direction shall be made with fittings. Horizontal piping shall be run at right angles to building lines.
- D. Piping shall be carefully installed to provide proper alignment, slope and expansion. Provisions shall be made to allow for expansion and contraction, pipe shall be guided and supported in such a manner that pipe lines shall not creep, sag, or buckle. Anchors and supports shall be provided wherever necessary to prevent misalignment of piping.
- E. Buried pipe shall be firmly bedded the full length each joint with the exception where bell holes are required. Where unstable soil conditions occur under buildings, support shall be made from the underside of the structural slab by an approved type hanging device embedded in the concrete.
- F. All exposed connections and run-outs to plumbing fixtures shall be brass pipe I.P. size, heavily chromium plated and polished.
- G. No piping shall be run over or within three (3) feet of electrical panels or switch gear.
- H. Terminate vent piping through roof, a minimum of twelve (12) inches above the roof. Paint to match roof color. Insulate to 3'-0" of roof.
- I. Location of vent on the roof shall be a minimum of twenty (20) feet away from rooftop or wall louver outside air intake or rooftop HVAC equipment outside air intake.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Provide gas fired tankless water heater including accessories listed in this specification and as necessary for proper operation of system.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, performance, and dimensions.

1.3 QUALITY ASSURANCE

- A. Underwriter's Laboratories (UL), Inc., according to ANSI Z21.10.3 - CSA 4.3 standards governing storage type water heaters;
- B. Meet or exceed the thermal efficiency and standby loss requirements of the U. S. Department of Energy and current edition ASHRAE/IESNA 90.1. Complies with
- C. SCAQMD Rule 1146.2 and other air quality management districts with similar requirements.

1.4 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of fuel-fired water heaters that fail in materials or workmanship within specified warranty period.
 - 1) Failures include, but are not limited to, the following:
 - Structural failures including storage tank and supports.
 - a) Faulty operation of controls.
- B. Deterioration of metals, metal finishes, and other materials beyond normal use.
- C. Warranty Period(s): 5 years From date of Substantial Completion

2. PART 2 - PRODUCTS

2.1 GAS WATER HEATERS

- A. HWH: Natural gas tankless water heater shall be Rinnai C199. FEATURES: • 96% thermal efficiency, Commercial ENERGY STAR® certified • 199,000 BTU • Ultra Low NOx compliant • Approved for high altitude up to 10,200 ft (3,109 m) • Indoor and outdoor models • Integrated temperature controller that provides 98°F to 185°F, no external controller required • Commercial warranty*: Limited 6-year on

the heat exchanger, 5-year on parts, up to 2 years on labor • Fuel conversion kits available • Isolation valves included

- B. Equals by A.O. Smith, Lochinvar, Rinnai

2.2 THERMAL EXPANSION TANKS

- A. Description: Steel, pressure-rated tank constructed with welded joints and factory-installed, butyl- rubber diaphragm. Include air - to minimum system-operating pressure at tank.
- B. Equals by AMTROL Inc., Armstrong Pumps, Inc.Taco, Inc., Watts Regulator Co. Wessels Co.
- C. Construction:
 - 1) Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.
 - 2) Interior Finish: Comply with NSF 61 barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.
 - 3) Air-Charging Valve: Factory installed.
- D. Capacity and Characteristics:
 - 1) Working-Pressure Rating: 150 psig.
 - 2) Air Pre-charge Pressure: 40 psig.
 - 3) Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.

2.3 WATER HEATER ACCESSORIES

- A. Gas Shutoff Valves: ANSI Z21.15/CGA 9.1, manually operated. Furnish for installation in piping.
- B. Gas Pressure Regulators: ANSI Z21.18, appliance type. Include pressure rating, capacity, and pressure differential required between gas supply and water heater.
- C. Gas Automatic Valves: ANSI Z21.21, appliance, electrically operated, on-off automatic valve
- D. Piping-Type Heat Traps: Field-fabricated piping arrangement according to ASHRAE/IESNA 90.1 or ASHRAE 90.2.
- E. Power Direct Venting: Water heater shall be suitable for power direct venting using PVC pipe for vent piping and intake air piping.

- F. Provide with scale filter with the gpm as shown on water heater detail.
- G. Provide with condensate neutralizer with single/multiple housings as required for the rated capacity of the connected water heater(s).

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. The heater shall be designed to produce the required gallons per hour at the temperature required based on the Btu input.
- B. Follow manufacturers recommendations for installation, space requirements, and piping sizing.
- C. Coordinate location with General Contractor.

◆ END OF SECTION ◆

1. PART 1 - GENERAL CONSTRUCTION NOTES

1.1 SECTION INCLUDES

- A. Plumbing fixtures

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, sizes and dimensions.

1.3 QUALITY ASSURANCE

- A. Meet requirements of OBBC, Plumbing Code, Section 4101:2-59.
- B. All fixtures shall meet the governmental regulations for low-flow operation.

1.4 MANUFACTURERS

- A. Refer to individual product item.

2. PART 2 - PRODUCTS

2.1 FIXTURES

1) WC ADA WALL MOUNTED WATER CLOSET

- a) Water closet Basis of design: Zurn Z5615-BWL AquaSense, EcoVantage High Efficiency Toilet System. Vitreous China, 1.6 gpf greater high efficiency, wall hung toilet with siphon jet flushing action and elongated front rim with 1-1/2" top spud.
- b) Flush valve basis of design: Sloan Royal Model 111 -1.6 gpf flush valve handle facing open side of stall.
- c) Color: White
- d) Mounting height - see drawing A500.1
- e) China and valve equal by American Standard, Sloan or Kohler
- f) Seat basis of design : Church Model# 9500SSCT Commercial, heavy duty white solid plastic, elongated, open front w/o cover and self sustaining hinges. Equal by Bemis or Olsonite.
- g) Carrier Basis of design: Zurn #Z1201 commercial grade floor mounted back to back single as required with min 750 lb rating. Equal by Wade, Smith or Watts.

2) LAV ADA CHINA LAVATORY

- a) American Standard Lucere 0355.012 with 4" centers for concealed support brackets equal by Crane, Kohler or Eljer

- b) Zurn AquaSpec Z81101-XL-3M, Polished chrome-plated cast brass faucet body with integral shanks, quarter turn ceramic disc cartridges and a 4" long integral cast spout. Unit is furnished with a 0.5 pressure compensating aerator, 2-1/2" vandal-resistant color-coded metal lever handles, mounting hardware and 1/2" NPSM coupling nuts for standard lavatory risers.
 - c) Equal by Chicago Faucet, Delta or Kohler.
 - d) Supply with grid drain.
 - e) Supply lavatory with an ASSE 1070 listed thermostatic valve.
 - f) Mounting height - see drawing A500.1
 - g) Provide with seamless insulation on waste and water lines
 - h) Carrier in chase: Zurn commercial grade floor mounted. Equal by Wade, Smith or Watts.
- 3) FD: FLOOR DRAIN
- a) Zurn Z-415 body assembly with 3" outlet and 6" type "B" nickel bronze strainer.
 - b) Provide with trap sealer.
 - c) Equals: Smith, Watts, MIFAB.
- 4) EW C ADA SPLIT- LEVEL WATER COOLER
- a) ADA-compliant, Bi level, Wall-mounted, filtered with electronic bottle filler): Oasis Model PG8FEBFSL shall deliver 8.0 gph of 50°F water at 90°F ambient and 80°F inlet water per ASHRAE 18 testing. Shall include the VersaFiller Sports Bottle Filler with contactless activation and laminar flow; fountains shall have four push pads to activate the manual flow of water for the cooler. Key VersaFiller components contain Freshield®, which utilizes a silver-based antimicrobial compound to protect the surfaces from discoloration, odors and degradation caused by the growth of micro-organisms and mildew. Basin shall be designed to eliminate splashing and standing water. Water saver bubbler shall have flexible guard and operate between 20 and 100 PSI. Shall use R-134a refrigerant. Greystone powder coat on galvanized steel
 - b) Equal by Elkay, Haws, or Sunroc
- 5) MS SQUARE MOP SINK
- a) Fiat model MSB2424 molded stone mop basin
 - b) 830AA faucet set with vacuum breaker, drain grid, 832-AA hose and wall hook and BP splash panel.

- c) Equal by Mustee or Floestone.
- 6) SK DOUBLE COUNTERTOP SINK
 - a) Elkay LR3322, 18 gauge, 302 stainless steel self rimming. sink with three holes for faucet.
 - b) Gooseneck faucet LK-2432 and L-8 Grid Strainer.
 - c) Equal by Just or Kohler
- 7) HWH WATER HEATER
 - a) See Section 22 34 36 of these specifications.
- 8) HB FREEZE PROOF WALL HYDRANT
 - a) Zurn Ecolotrol anti siphon freeze proof, encased exterior wall hydrant.
 - b) Flush stainless steel box and keyed cover
 - c) Equal by Jonespec, Smith or Watts.
- 9) FS FLOOR SINK 8" x 8" x 6"
 - a) Zurn FD2378- 8" x 8" - 6" depth with 1/2 grate as shown on kitchen plan with white A.R.E. anti-splash bottom dome.
 - b) Equals: Smith, Watts, MIFAB.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Wall mounted water closets, lavatories and electric water coolers shall have carriers attached to the floor.
 - 1) Manufacturers Zurn, Smith, Wade or Watts.
- B. All ADA fixtures shall be installed in accordance with latest ADA codes and standards, complete lavatories with seamless insulation on waste and water lines.
- C. Caulking Fixtures: All joints between china plumbing fixtures and wall surfaces shall be caulked with polysulfide sealant. See Section 07 92 00 of the specifications.
- D. Fixture stops for lavatories, sinks and similar fixtures shall have a key operated stop valve installed. Stop valves shall be of the same manufacturer and heavy duty type.
- E. All piping penetrations shall be covered with chrome escutcheons.

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- F. Upon acceptance and turnover of project thoroughly clean all plumbing fixtures in their entirety.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 HVAC SECTIONS

- A. SECTION 23 00 00 – GENERAL PROVISIONS
- B. SECTION 23 05 29 – HANGERS AND SUPPORTS FOR HVAC PIPING
- C. SECTION 23 05 93 – TESTING, ADJUSTING AND BALANCING FOR HVAC
- D. SECTION 23 07 00 – HVAC INSULATION
- E. SECTION 23 23 00 – REFRIGERANT PIPING
- F. SECTION 23 31 13 – LOW-PRESSURE DUCTWORK
- G. SECTION 23 33 00 – DUCTWORK ACCESSORIES
- H. SECTION 23 34 00 – HVAC FANS
- I. SECTION 23 37 13 – DIFFUSERS, REGISTERS, AND GRILLES
- J. SECTION 23 54 16 – FURNACES
- K. SECTION 23 62 13 – REFRIGERANT CONDENSING UNITS

1.2 SCOPE OF WORK

- A. Work under HVAC includes all necessary work required to complete the Heating & Ventilating Air Conditioning System as shown on the drawings and as herein specified and as follows:
 - 1) The complete installation of the heating, ventilating and air conditioning system as shown on plans and specified.
 - 2) The installation of electric heat furnaces and condensing units and controls.
 - 3) Sheet metal ductwork, exhaust fans, diffusers and return air grilles.
 - 4) Duct insulation.
 - 5) Certified Air balance.
 - 6) All required demolition.
 - 7) All test inspections and permits.

2. PART 2 - PRODUCTS

2.1 SLEEVES

- A. In Drywall, Masonry, or Concrete Wall Construction:
 - 1) Provide sleeves for piping, refrigerant piping, and duct penetrations
 - 2) Option for above ceiling only: Contractor shall omit block(s) where required for penetrations, and shall provide square-finished opening. Do not omit blocks under bearing points or in fire-rated or smoke-rated walls. Do not omit blocks in walls which serve as sound barriers.
 - 3) Contractor shall provide openings through metal building walls and roof, and seal watertight.
- B. In precast concrete work, in lieu of sleeves, cut holes after erection of concrete.
- C. Sleeve where pipes and ductwork pass exposed through walls, and where any piping or ductwork passes through smoke-rated or fire-rated separations, equipment room walls, or above-grade floors.
- D. Verify which walls, ceilings, or floors are fire-rated, if any, and provide approved fire-blocking or fire-protective devices as required.
- E. Carefully coordinate and check locations of sleeves immediately before and after each concrete pour and masonry installation.
- F. Sleeves are not required in floor slabs on grade or in core-drilled openings not requiring water-proofing or fire suppression. **Exception:** Sleeves are required at core drilling through hollow core pre-cast slabs and through concrete block walls, to facilitate containment of required fire-stopping material.
- G. Sleeving with absolutely watertight seal is required for piping passing through exterior walls above grade, and underground foundation walls and other below-grade penetrations into building.

2.2 STANDARD SLEEVES

- A. Material:
 - 1) Pipe sleeves:
 - a) Up to 8 in. diameter: Machine-cut Schedule 40 black steel pipe.
 - b) Bare copper piping: Copper sleeves.
 - c) **Option** In walls: Schedule 40 plastic pipe may be used for pipe sleeves, except where adjacent ceiling space is used for return air plenum. Refer to Drawings.
 - 2) Duct sleeves: 14 ga. steel.

- B. Sizing: Sleeves shall be large enough for insulation to be continuous, or for watertight or fire-rated sleeve seals to be installed. Size to allow 1/2 in. minimum clearance all around pipe or pipe insulation, and ductwork.

2.3 WATERTIGHT SLEEVE SEALS

- A. Oakum Caulking: With lead-pour or elastomeric sealant. Elastomeric sealant shall be 2-component, polysulfide or polyurethane.

2.4 FIRE-RATED SLEEVE SEALS

- A. ASTM E119 and E814 Silicone RTV foam, UL-approved.

2.5 MOTOR CONTROL

- A. For all motors furnished as part of this contract, the Electrical Contractor shall furnish and install all fused disconnects, combination disconnects and starters, and push button stations as required for the control of these motors unless noted otherwise.

2.6 ACCESSIBILITY AND ACCESS PANELS

- A. Install work so as to be readily accessible for operation, maintenance and repair. Where valves or other specialties are concealed in the construction or behind a wall or ceiling surface, contractor shall furnish and install an access panel of adequate size to permit adjustment or service or a concealed panel of adequate size to permit adjustment or service of concealed device. Panels shall be of a design suitable for installation in the material forming the finished surface in which each is mounted.

2.7 MANUFACTURERS NAMEPLATES

- A. Each unit of equipment shall be identified by permanently attached nameplate of corrosion-resistant metal. Plates shall bear the following information.
 - 1) Manufacturers Name
 - 2) Serial and Model Numbers
 - 3) Rated Capacity
 - 4) Temperature, Pressure or Other Limitations

2.8 DESIGN BASE MANUFACTURER STANDARD

- A. The Drawings and Specifications are based on the specific equipment requirements and configuration for a Design Base Manufacturer. Design coordination of equipment with the building and with other Trades has been made for this specific Model and Manufacturer of equipment. Where several Manufacturers are listed for an item of equipment or material, the first-named shall

be considered the Design Base Manufacturer Standard.

- B. Consideration will not be given to any other Manufacturer that the Contractor proposes to use, unless the Manufacturer has been approved by the A/E and specifically named in the Contract Documents or Addenda thereto.

2.9 OTHER MANUFACTURERS

- A. Any specified Equipment Manufacturer furnished by the Contractor other than the Design Base Manufacturer shall be, in the opinion of the A/E, equivalent in quality, design, features, performance, arrangement, and appearance to that of the Design Base equipment or material, including any special features or requirements.
- B. No consideration will be given to any Manufacturer which the Contractor proposes as an "Approved Equal," unless the Manufacturer has been approved by the A/E during the bid period, and specifically named in the Contract Documents or Addenda thereto.
- C. Recognizing that since no two Manufacturers are "identical," whenever the Contractor elects to furnish specified equipment or material manufactured by other than the Design Base Manufacturer, the Contractor shall be responsible for the cost and coordination of all modifications required to accommodate the elected equipment or material.
- D. Where deemed necessary by the A/E, the Contractor shall, at no additional cost to the Owner, prepare new layouts for these other brands of equipment which may have different dimensional or service requirements from the Design Base Manufacturer Standard. Submit these layouts to the A/E for review.
- E. Reimburse the A/E for the cost of any design changes incurred by the A/E in the preparation of revised Drawings or Specifications to accommodate the use of any Manufacturer other than the Design Base Manufacturer.

2.10 ALTERNATIVE MANUFACTURERS

- A. Contractor shall submit information on any proposed equipment or material that it desires to use as an Approved Equal.
- B. If the A/E determines an alternative Manufacturer to be acceptable, it will issue an Addendum adding that Manufacturer to the Specification.

2.11 EQUIPMENT SUITABILITY

- A. All equipment provided shall perform as intended. All items listed shall function properly, and as the Manufacturer intended. Install equipment according to the Manufacturer's recommendations. Properly attach equipment to the floor, wall, or structure. Each item of equipment shall be compatible with all other accessories or hook-ups, including flues, piping, controls, wiring, and other equipment that are not furnished by the equipment Manufacturer, but that are required as an

accessory or modification, as necessary to achieve its intended function.

2.12 MISCELLANEOUS ACCESSORIES

- A. Provide any additional adapters, fittings, trim, structural steel angles, channels, Unistrut, brackets, etc., as necessary to securely mount and install all items of equipment specified or shown on the Drawings. All steel installed outside or exposed to moisture shall be hot-dipped galvanized.
- B. These accessories are required even though they may not be shown or detailed on the Drawings.
- C. Installation shall be compatible with the building construction on which the item is to be located.
- D. Verify the type of construction prior to ordering the equipment item, so that all required accessories are included.

2.13 QUANTITIES

- A. Equipment may be referred to in these Specifications, or on the Drawings, as either singular or plural; the Contractor shall verify the exact number of items required to complete its Work.

2.14 PAINTING OF HVAC SYSTEMS

- A. Refer to Division 9 for painting specifics.
- B. HVAC systems shall be painted to match adjacent finishes where noted.

3. PART 3 - EXECUTION

3.1 WORK SPECIFIED ELSEWHERE:

- A. The Contractor is referred to the General Documents and applicable portions of Division 01 of the Specifications. The Instructions to Bidders, General Conditions, Supplemental General Conditions, Special Conditions, Addenda, Alternates, Ohio Building Codes, these Technical Specifications, together with the Contract and Proposal, comprise the Contract Documents for this contract.

3.2 INTENT OF DRAWINGS AND SPECIFICATIONS:

- A. Work covered by these specifications and accompanying design drawings shall include all labor, materials, equipment, and services necessary for, and reasonably incidental to, the complete installation of the mechanical systems for the project. Any additional material, labor, or electrical modifications in using equals or approved equals is the responsibility of this contractor.
- B. Drawings are diagrammatic in nature, designed to provide Contractor with a working knowledge of systems to be installed. Omissions of minor specialties, or

minor modifications to lay-out due to exigencies of construction, shall not relieve the contractor of the responsibility of furnishing and installing all materials and work required to make the systems complete and operative.

- C. The drawings indicate required size and points of termination of pipes and ducts and suggest proper routes to conform to structure, avoid obstructions and preserve clearances. However, it is not intended that drawings indicate all necessary offsets, and it shall be the work of this Contractor to make the installation in such a manner as to conform to structure, avoid obstructions, preserve headroom and keep openings and passageways clear without further instructions, or cost, to the Owner or Architect.
- D. The drawings shown, in general, where the pipes, ducts and equipment are to be located. This Contractor shall check over all the drawings and details carefully. Location of duct work and equipment may not be changed without written approval by the Architect.
- E. Selection of equipment and fabrication of all elements including piping etc. shall meet space and service requirement of the project.
- F. Substitution of makes other than those specifically named in the specifications, and drawings, will be approved by the Architect for the following reasons only - that the materials proposed for substitution are equal to and/or superior to equipment named, in construction, efficiency and utility, and further that the equipment named in the specifications cannot be delivered to the job in time to complete the work in proper sequence to work of other trades, due to conditions beyond control of contractor. Any additional material and/or labor in using equals or approved equals is the responsibility of this contractor.
- G. To receive consideration, requests for substitutions must be accompanied by documentary proof of equality of difference in price and delivery, if any, in form of certified quotation from suppliers of both specified and proposed equipment.
- H. In case of difference in price, the Owner shall receive all benefits of the difference in cost involved in any substitution and the contract altered by change order to credit Owner with any savings so obtained.
- I. Consult all drawings, Architectural, Structural, Mechanical & Electrical. Refer any discrepancies to the Architect before bid due date, - otherwise, corrections shall be made at expense of this contractor.

3.3 CODES AND STANDARDS:

- A. All materials and workmanship shall meet, in minimum, applicable provisions of State and Local Codes and Regulations governing the work. Where plans or specifications call for work or materials exceeding minimum standards, the plans and/or specifications shall apply.

- B. In the event any work shown or indicated on the drawings or in the specifications requires modification, or additions, to meet applicable Codes, the Contractor shall notify the Architect and obtain clarification before proceeding with the work.
- C. Contractor shall secure and pay for all notices, local permits and inspections required under applicable Codes and Regulations, including final Certificates of Approval, and shall pay all fees for same. The Plumbing Contractor will secure the State Plumbing Permit.

3.4 REFERENCE SYMBOLS:

- A. Symbols for various references used herein include:
 - 1) A.G.A. American Gas Association
 - 2) A.W.W.A. American Water Works Association
 - 3) A.S.H.R.A.E. American Soc. of Heating, Refrigeration & A.C.Eng.
 - 4) A.S.M.E. American Society of Mechanical Engineers
 - 5) P.D.I. Plumbing - Drainage Institute
 - 6) C.I.S.P.I. Cast Iron Soil Pipe Institute
 - 7) S.M.A.C.N.A. Sheet Metal & Air Conditioning Contractors National Association, Inc.
 - 8) N.F.P.A. National Fire Protection Association
 - 9) UL Underwriters Laboratories, Inc.
 - 10) NEC National Electrical Code
 - 11) A.N.S.I. American National Standards Institute
 - 12) O.S.H.A. Occupational Safety and Health Act
 - 13) L.E.E.D. Leadership in Energy and Environmental Design

3.5 PROTECTION AND CLEANING

- A. This contractor shall be completely responsible for adequate protection of all his materials and equipment during shipment, storage and on site, until final acceptance of the project by the Architect.
- B. Permanent HVAC equipment can only be used for temporary heating if permission is granted by architect. A minimum of MERV8 filters shall be installed

at return air grilles and in air handler if approved for use. Protect HVAC equipment from odors and dust.

- C. Seal all duct and equipment openings with plastic in storage and installed
- D. Protect stored on-site and installed absorptive material from moisture damage.
- E. Smoking will not be permitted inside the building or within 25 feet of entrances.
- F. In addition to the provisions and stipulations of the General Conditions, this contractor shall provide various types of protection as follows:
 - 1) Protect finished floors from chips and cutting oil by the use of metal chip receiving pan and an oil proof floor cover.
 - 2) Protect equipment and finished surfaces from welding and cutting spatters with baffles and spatter blankets.
 - 3) Protect equipment and finished surfaces from paint drippings, insulation adhesive and sizing droppings, etc. by use of drip cloths.
 - 4) Protect existing construction where work is required to be performed in same.
- G. During the course of construction, this contractor shall maintain his materials, equipment, etc. in a neat and orderly manner and maintain the work spaces as clean as possible consistent with the conditions under which the work is to be conducted.
- H. During the course of construction, cover and otherwise protect all mechanical and plumbing equipment and insulation from damage, dirt, plaster, water, etc. This contractor shall be responsible to repair and/or replace all damaged mechanical equipment and materials.
- I. At the time of completion, this contractor shall clean thoroughly all the apparatus and equipment furnished by him.
- J. All air handling equipment, blowers, etc. which are equipped with air filters shall have new filters installed at the time of the project completion.

3.6 CONSTRUCTION DRAWINGS (AS BUILT DRAWINGS)

- A. This contractor shall keep an accurate record of all deviations from contract drawings and specifications. He shall neatly and correctly enter, in colored crayon, any deviations on drawings affected and shall keep drawings available for inspection. Extra set of drawings will be furnished for this purpose.
- B. Record all changes showing:
 - 1) Size, type, capacity, etc. of any material, device or piece of equipment.

- 2) Location of any device or piece of equipment.
- 3) Location of any outlet or source in building service system
- 4) Routing of any piping, conduit, ducts, sewers or other building services.
- C. These drawings shall also record the location of all concealed piping, ducts, conduit and other piping, by indication of measured dimensions to each such line from readily identifiable and accessible walls or corners of the building.
- D. These drawings shall be kept clean and undamaged and shall not be used for any purpose other than recording deviations from working drawings and exact locations of concealed work.
- E. After the project is completed, these sets of drawings shall be delivered to Architect, in good condition, as a permanent record of the installation as actually constructed.

3.7 SHOP DRAWINGS (SUBMITTALS)

- A. As soon as practicable, within 30 days after award of Contract, and before any materials, equipment or accessories are manufactured, the Contractor shall submit to the Architect for approval a minimum of five (5) copies, or sets, of shop drawings and detailed data describing all equipment he proposes to install. The equipment proposed for installation shall be in accordance with the provisions of these specifications and accompanying drawings. The submitted shop drawings shall include the names describing the equipment. The submitted shop drawings must be marked to indicate the type and/or catalog number and must be marked with the designating symbol and/or mark number used on the plans or in the specifications for each item.
- B. Approval of materials will be based on the manufacturers published ratings or certified drawings. All materials of like kind shall be one manufacturer.
- C. This contractor shall examine all shop drawings and shall signify on the same that he has approved the equipment as acceptable according to the specifications and has approved the use of the equipment for space requirements of the project.
- D. Any equipment that requires a color selection shall have a color sample - metal - sample - submitted with the shop drawings, or provide the Architects office metal color samples for use of color selection in advance of shop drawing submittals.

3.8 TESTS AND ADJUSTMENTS

- A. This contractor shall furnish all required labor, materials and equipment and perform all tests required under applicable Codes for all mechanical systems.
- B. Where non-adjustable drive sheaves are provided with the equipment, this contractor shall be responsible for furnishing and installing the replacement sheaves required to balance the system.

- C. In the event leaks are observed, repairs or replacement shall be made and system retested.
- D. All systems shall be finally adjusted, all damaged goods replaced all repairs made, finally leaving all mechanical systems in clean complete, efficient operating order.

3.9 GUARANTEE AND WARRANTY

- A. This contractor shall guarantee all work installed by him, or his subcontractors to be free from defect in material and workmanship for a period of one year following the date of final acceptance of the work, unless a longer period is stipulated under specific headings, and he shall repair or replace - at no additional cost to the Owner - any material or equipment developing defects and shall also make good any damage caused by such defects or the correct of defects.
- B. This contractor shall submit his own and each equipment manufacturer's written certificates, warranting that each item of equipment furnished complies with all requirements of the drawings and specifications.
- C. Note that guarantee shall run from date of final acceptance of the work, not from date of installation of a device or piece of equipment. Deviations from this may occur on larger items of equipment used during the beneficial occupancy before the total system is accepted, shall be made a matter of written record by the Architects Representative, in agreement with the authorized representative of the Owner.

3.10 WORKMANSHIP

- A. All work shall accomplished by mechanics skilled in the particular trade involved. Proper provision shall be made on all piping for expansion and contraction, using right angle loops, swing joints, or an approved type of expansion joints, whether the same as shown on drawings or not. Pipe shall be sloped to drain and installed parallel to adjacent walls. Contractor shall furnish and install all necessary valves, air vents, automatic devices and other specialties required to make the system complete whether the same is shown on the drawings or not.

3.11 VISITING THE SITE

- A. This contractor shall visit the site of the proposed work and shall familiarize himself with all conditions under which the work must be performed. He shall verify all data relative to location and size and capacity of new and/or existing utilities and determine the specific requirements of utility involved and shall include in his bid all materials and equipment required by such utility.

3.12 SUPERVISION OF WORK

- A. This contractor shall have in charge of the work, at all times during construction, a competent superintendent experienced in the work to be installed under this contract.

3.13 CONFERENCE PRIOR TO START OF WORK

- A. Immediately upon the award of Contract and before any work is started, the Contractor shall meet and confer with the Architect concerning the work under this Contract.
- B. Check with Project Architect as to time and place of meeting.

3.14 ADHERENCE TO REGULATIONS

- A. Give notices and comply with laws, ordinances, rules, regulations and orders of any public authority bearing on the work. If Contractor observes that Contract Documents are at variance with such in any respect, promptly notify Architect, in writing, necessary changes shall be adjusted by Change Order. If Contractor knowingly performs any work contrary to such without notice to Architect, he shall assume full responsibility therefore and shall bear cost attributable thereto.

3.15 RUBBISH

- A. All rubbish resulting from the work herein specified shall be removed from the premises as fast as it accumulates.
- B. On Completion of his work, this contractor shall remove from the site all tools, equipment, surplus materials, and rubbish pertaining to his own operations. Each Contractor shall pay all costs for such removal and disposition and shall perform final cleaning. Refer to contract for additional requirements.

3.16 REQUIREMENTS FOR FINAL INSPECTION

- A. All of the following items must be completed prior to final inspections. No exceptions will be made and no final payment will be made until all items are completed.
- B. Thoroughly clean all parts of the apparatus and equipment. Adjust and calibrate all controls and place system software in fully operating condition.
- C. Submit Operating Instructions, Service Manual and System Documentation, including all warranties.
- D. Complete all punch list items.
- E. Submit 'As-Built' drawings to Architect.

3.17 DAMAGE BY LEAKS

- A. This contractor shall be responsible for damage to the grounds, walks, roads, buildings, piping systems, electric systems and their equipment and contents, caused by leaks in the piping systems being installed or having been installed herein. He shall repair at his expense all damages so caused. All repair work shall be done as directed by the Architect.

3.18 EMERGENCY REPAIRS

- A. The Owner reserves the right to make emergency repairs, as required to keep equipment in operation without voiding the contractors' guarantee bond nor relieving the Contractor of his responsibilities during the bonding period.

3.19 INSPECTION AND FEES

- A. Defective Work - If inspection or tests show defects, such defective work or material shall be replaced and inspection and tests repeated. Repairs or piping shall be made with new material. No caulking of screwed joints or holes will be acceptable. All tests shall meet with the approval of state and local inspections.

3.20 SAFETY REQUIREMENTS

- A. Contractor shall comply with OSHA requirements for physical hazards, safety equipment, fire fighting equipment and protective equipment.

3.21 PROHIBITED CONSTRUCTION

- A. There shall be no duct, water, waste, steam or condensate lines placed over electrical switchgear, transformers, or electric wall panels.

3.22 OPERATING INSTRUCTION MANUAL

- A. Submit one copy to the Architect for approval.
- B. After approval, submit three (3) copies to the Architect for delivery to the Owner in approved format.
- C. Bind the written operating instructions, shop drawings, equipment catalog cuts and manufacturer's instructions into a hardbacked binder where they can be accommodated into 8½ "x 11" size. Material to be assembled as follows:
 - 1) First Page - Title of job, school district, address, date of submittal, name and telephone number of Contractor, Subcontractors, and name of Engineer.
 - 2) Second Page - Index.
- D. First Section - A copy of each manufacturer's installation and operating instructions.
- E. Second Section - A copy of each approved shop drawing.
- F. Each section shall be identified with descriptive tabs.

3.23 PERSONNEL INSTRUCTION

- A. Provide a minimum of 2 hours total instruction to personnel selected by Owner for operation of building mechanical system. This is over and above specialized systems listed elsewhere in this specification. Instructions shall include the following:
- 1) Show location of items of equipment and explain what they do.
 - 2) Refer to operating instruction manual for record and clarity.
 - 3) Coordinate written and verbal instructions so that each is understood by personnel.

◆ END OF SECTION ◆

HANGERS AND SUPPORTS FOR HVAC PIPING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hangers, supports, and concrete inserts required for piping, ductwork, and equipment.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting material, sizes, and dimensions.

1.3 QUALITY ASSURANCE

- A. All piping supports and parts shall conform to the latest requirements of the Code for Power Piping 9ANSI B31.1 and MSS Standard Practice SP-58 and SP-69.
- B. For ductwork supports, refer to SMACNA's "HVAC Duct Construction Standards Metal and Flexible" (Latest Edition).

1.4 MANUFACTURERS

- A. Grinnell, Mason, or Kinetics

2. PART 2 - PRODUCTS

2.1 HANGERS

- A. Insulated Piping:
 - 1) Steel or Copper
 - a) All sizes: Grinnell Fig. 260, adjustable clevis, carbon steel yoke, U-strap, bolt and hex nuts.
 - b) Hanger size must be sufficient to accommodate pipe without compressing the insulation.
 - c) All hangers shall be external of insulation.

2.2 SPRING HANGERS

- A. Light duty (250 lb. Max): Grinnell Fig. 247, all-welded construction, enclosed spring.
- B. Grinnell Fig. B268, Type A or B, adjustable pre-compressed variable spring, steel construction.

2.3 TRAPEZE HANGERS

- A. Unistrut or angle iron of sufficient length to support pipes and insulation on individual hangers, roller supports or saddles with insulation protectors; trapeze hanger rod diameter and quantity as required to support total piping load.

2.4 SUPPORTS

- A. Pipe hanger rod sizes shall be 3/8".
- B. Beam Clamps
 - 1) Grinnell Fig. 227, top beam clamp, steel jaw, hook rod with nut and spring washer steel eye-bolt.
 - 2) "C" Clamps: Grinnell Figs. 87, 92, 93, or 94, malleable iron body, steel pointed set screw with lock nut and retainer strap. Beam clasps by themselves (C-clamps) are expressly prohibited. Provide retainer straps with all beam (C-Clamps).
 - 3) Consult with MSS SP-58 and SP-69 for C-Clamp identification.
 - 4) Grinnell Fig. 60 steel washer plate and double nutted is used with threaded rod.
 - 5) Wall brackets: Grinnell Fig. 194 (light weight 750 lb. Load) or Fig. 195 (medium weight 1500 lb. Load), carbon steel, back plates and bolts.

2.5 INSERTS

- A. In concrete: Grinnell Type CB, Fig. 282, universal mounting, malleable iron construction, lateral adjusting.
- B. In precast concrete (2-inch pipe maximum): Grinnell Fig. 117, expansion case, interior standard pipe threads, external helical wedge, malleable iron construction.

3. PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. Install necessary pipe hangers and supports to properly support all piping and to maintain piping uniformly level (3/4" maximum deflection). Hangers to be double nutted.
- B. Maximum spacing of piping supports to be as follows:

PIPE SIZE	STEEL PIPE	COPPER PIPE
3/4" or smaller	7'	5'
1"	7'	6'

- C. Install wall brackets where required.
- D. Support piping at equipment from floor, structure or walls, so that piping weight is not supported by equipment.

3.2 DUCTWORK HANGER INSTALLATION

- A. Install necessary hanger rods and angle iron support brackets to properly support ductwork, insulation, reinforcing and external loads. Friction clamps are excluded as upper attachment devices.
- B. Maximum spacing of supports to be as follows:

RECTANGULAR DUCTS		
½ X Duct Perimeter Less than 72"	Rod Diameter 3/8"	Spacing 10'
ROUND DUCTS		
Duct Diameter Up thru 24"	Rod Diameter 1/4"	Spacing 12'

- 1) Use a pair of rods, one on each side of ductwork. Rods to be un-coated hot-rolled steel.
- 2) Option: 16 gauge, 1" wide sheet metal straps may be used on sizes up to 22" wide (or diameter).

3.3 GENERAL INFORMATION

- A. Ceiling grid system shall not be used to support ductwork, electrical conduit, heating lines or any other utility lines. Each utility and the ceiling grid system shall be a separate installation and each shall be independently supported from the building structure. Where interferences occur, in order to support ductwork or piping, the Contractor must install trapeze type hangers or supports which shall be located where they do not interfere with access to fire dampers, valves, and other mechanical equipment items.
- B. Where necessary, the Contractor shall furnish and install proper angles or channels between joists for hanger supports. Weld to steel structural members.
- C. Avoid cutting concrete or masonry by using inserts. Use top flange beam clips to avoid burning metal deck.
- D. Furnish and install any intermediate supporting steel or supports, foundations, and concrete pads required for proper support of all piping and equipment.

◆ END OF SECTION ◆

TESTING, ADJUSTING, AND BALANCING FOR HVAC

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. The testing, adjusting, and balancing of the HVAC air systems.
- B. The performing contractor's certification requirements.

1.2 SUBMITTALS

- A. Submittals are required and shall include the complete certified report for all air and water system pressure testing and balancing including all electrical performance of each piece of HVAC equipment.
- B. Prior to commencement of the work described in this Section, the testing, adjusting, and balancing contractor shall submit verification of his AABC or NEBB certification to the Design Professional for acceptance.
- C. Prior to commencement of the work described in this Section, the testing, adjusting, and balancing contractor shall submit proposed forms to be used for recording.

1.3 QUALITY ASSURANCE

- A. The testing, adjusting, and balancing contractor shall be either AABC or NEBB certified for the work described herein.

2. PART 2 - PRODUCT

2.1 COMPONENTS

- A. The Contractor shall provide his own properly calibrated equipment to pressure test, air balance, water balance and to measure electrical characteristics of each piece of HVAC equipment.

3. PART 3 - EXECUTION

3.1 The Balancing Contract shall incorporate the following:

- A. Adjust and balance the complete mechanical system as hereinafter specified.
- B. Record all test data from the latest available revised set of mechanical plans and submit four copies upon completion of the balancing contract.
- C. At the completion of the balancing contract, instruct the Owner's personnel in the proper operation and maintenance of each piece of equipment.

3.2 AIR BALANCE

- A. The Balancing Contractor shall adjust dampers to obtain approximate balance of system. Check CFM, adjust each supply, return and exhaust damper to design CFM. Continue progressive refinement of adjustment, and furnish the Architect with test data showing CFM's progressively obtained and final CFM. Final payment will not be made until test data has been delivered to the Architect.
- B. The test procedure shall be as follows:
 - 1) Test and adjust fan RPM to design requirements. At AHU's replace or adjust sheaves to obtain scheduled maximum CFM at actual static pressure. At variable speed AHU's replace or adjust sheaves to obtain the scheduled supply CFM. Scheduled CFM shall not be exceeded with Variable drive at 100% where present.
 - 2) Test and record motor full load amperes.
 - 3) Make Pitot Tube traverse of main supply ducts and obtain design CFM at fans.
 - 4) Test and record system static pressures, suction and discharge.
 - 5) Test and adjust system for design recirculated air, CFM.
 - 6) Test and adjust system for design CFM outside air.
 - 7) Test and adjust system for design exhaust CFM.
 - 8) Test and adjust system for design CFM in full economizer mode.
 - 9) Test and record energy recovery system in full by pass during morning warm up.
 - 10) Test and record entering D.B. cooling air temperature.
 - 11) Test and record entering W.B. cooling temperature.
 - 12) Test and record leaving D.B. cooling temperature.
 - 13) Test and record leaving W.B. cooling temperature.
 - 14) Adjust all main supply and return air ducts to proper design CFM.
 - 15) Adjust all areas to proper design CFM, supply and return.
 - 16) Test and adjust system for design at all exhaust fans.
 - 17) Test and adjust each diffuser, grille, control unit, control terminal, etc. to within 5% of design requirements. Total air quantities for a zone or floor shall be from 0 to a maximum +10%.

- 18) Identify each grille, diffuser, control unit, control terminal, satellite, etc., as to location area, size, type and manufacturer.
 - 19) Readings and tests of diffusers, grilles, control units, control terminals, satellites, etc., shall include requirement FPM velocity and test resultant velocity, required CFM and test resultant CFM after adjustments, all in accordance with manufacturer's ratings.
 - 20) In cooperation with the control manufacturer's representative, set adjustments of automatically operated dampers to operate as specified, indicated, and noted.
 - 21) Adjust diffusers, grilles, satellites, etc., to minimize drafts in all areas.
 - 22) The Heating, Ventilating, and Air Conditioning Contractor shall make all changes in the sheaves, belts and dampers, and the addition of dampers as required for correct balance as required by Air Balance Agency, at no additional cost to the Owner.
- C. Upon completion of detailed balance, all information shall be inserted on a sheet listing all items required by specifications and be included in a complete test and balance report. All sheets shall be neatly typed.
- D. The Balancing Subcontractors shall, as a part of his work, perform a "spot" re-check of balancing conditions between 30 to 90 days after balancing, operations - at which time a representative of the Temperature Control Manufacturer capable of performing adjustments to his system shall accompany the representative of the balancing contractor. The operations shall include a check of space temperatures, calibration of controls, fan performance and the necessary adjustments thereto. A written report, in triplicate, shall be furnished to the Architect.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Interior and exterior pipe insulation, jackets, and accessories.
- B. Field-applied insulation on hot and cold equipment surfaces.
- C. Exterior and interior duct and plenum insulation and accessories.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting materials, thickness for each service or piece of equipment, aged thermal qualities, and accessories.
- B. Provide product description, list of materials, "k" value, "R" value, mean temperature range, and thickness for each service and location.

1.3 Referenced Standards

- A. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
- B. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
- C. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:
 - 1) ASHRAE standard 90.1-2019
 - 2) ASTM International (ASTM).
 - 3) American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc. (ASHRAE).
 - 4) North American Insulation Manufacturers Association (NAIMA).
 - 5) NAIMA – "Guide to Insulating Chilled Water Piping Systems with Mineral Fiber Pipe Insulation".
 - 6) "National Commercial & Industrial Insulation Standards" – MICA Manual.
 - 7) Thermal Insulation Association of Canada (TIAC).
 - 8) National Fire Protection Association (NFPA).

- 9) Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
- 10) Underwriter's Laboratories (UL).
- 11) Underwriter's Laboratories Environment (UL Environment).

1.4 QUALITY ASSURANCE

- A. All ductwork requiring insulation shall be insulated as specified herein and as required for a complete system. In each case, the insulation shall be equivalent to that specified and materials applied and finished as described in these Specifications.
- B. All insulation, jacket, adhesives, mastics, sealers, etc., utilized in the fabrication of these systems shall meet NFPA for fire resistant ratings (maximum of 25 flame spread and 50 smoke developed ratings) and shall be approved by the insulation manufacturer for guaranteed performances when incorporated into their insulation system, unless a specific product is specified for a specific application and is stated as an exception to this requirement. Certificates to this effect shall be submitted along with Contractor's submittal data for this Section of the Specifications. No material may be used that, when tested by the ASTM E84-89 test method, is found to melt, drip or delaminate to such a degree that the continuity of the flame front is destroyed, thereby resulting in an artificially low flame spread rating.
- C. Application Company Qualifications: Company performing the Work of this Section must have minimum three (3) years experience specializing in the trade.
- D. All insulation shall be applied by mechanics skilled in this particular Work and regularly engaged in such occupation.
- E. All insulation shall be applied in strict accordance with these Specifications and with factory printed recommendations on items not herein mentioned. Unsightly, inadequate, or sloppy Work will not be acceptable

1.5 DELIVERY, STORAGE and HANDLING

- A. Deliver, store, protect, and handle products to the Project Site.
- B. Deliver materials to Site in original factory packaging, labeled with manufacturer's identification including product thermal ratings and thickness.
- C. Store insulation in original wrapping and protect from weather and construction traffic. Protect insulation against dirt, water, chemical, and mechanical damage.
- D. Maintain ambient temperatures and conditions required by manufacturers of adhesives, mastics and insulation cements.

1.6 MANUFACTURERS

- a) CertainTeed Corporation.
- b) Johns Manville Corporation.
- c) Knauf Corporation.
- d) Owens-Corning.
- e) Schuller
- f) Armacell North America.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Glass Fiber: All-purpose jacket and vapor-barrier coated.-concealed supply air duct
 - 1) Preformed: ASTM C 547, Class I, rigid, jacketed, and vapor-coated.
 - 2) Board: ASTM C 612, Type 2, rigid and semi-rigid.
 - 3) Blanket: ASTM C 553, Type II, Class F-1.
 - 4) Adhesive: UL classification; nonflammable, low VOC.
 - 5) Maximum "K" Value: 0.23 at 75 degrees F.
 - 6) 1.5 lb/cu ft minimum density; 0.002 inch foil scrim kraft facing for air ducts
- B. Piping: Fiberglass preformed insulation; ASTM C 547; minimum 3.0 lb/cu ft density, ASTM C335,'k' value of 0.23 at 75 degrees F; noncombustible-hydronic piping
- C. Flexible Elastomeric Cellular: Flexible cellular elastomeric material, molded or sheet.-All chilled water equipment and valves including air separator and pump bodies.
 - 1) Preformed: ASTM C534, Type II.
 - 2) Adhesive: Waterproof vapor retarder. Low VOC.
 - 3) Maximum "K" Value: 0.28 at 75 degrees F.
- D. Calcium Silicate
 - 1) Piping: Rigid molded block isolation, asbestos free ASTM C553, Type I.
 - 2) Maximum "K" Value: 0.40 at 300 degrees F.

E. Duct Liner Insulation –return/transfer air where noted and sound boots

- 1) Material: Flexible blanket, ASTM C518.
- 2) Coating: ASTM C1071.
- 3) Adhesive: UL listed waterproof.
- 4) Fasteners: Galvanized steel pins, welded or mechanically fastened.
- 5) Maximum “K” Value: 0.25 at 75 degrees F.
- 6) 3.0 lb/cu ft minimum density; coating air side for maximum 4,000 feet per minute air velocity. The airstream surface must be protected with a durable polyacrylate copolymer emulsion specifically formulated to:
- 7) Not support the growth of fungus or bacteria, when tested in accordance with the test method for fungi resistance in ASTM D 5590 with “0” growth rating.
- 8) Act as a fungicidal protective coating: water based, VOC < 50 g/l. Fungicidal coating must be EPA registered for use in HVAC duct systems. Manufacturer: H.B. Fuller Construction Products Inc., Foster 40-20 (white) or 40-30 (black) Fungicidal Protective Coating or approved equal. Coatings may also be used to repair damage to duct liner insulation.

F. Insulating Cements

- 1) Mineral fiber.
- 2) Expanded or exfoliated vermiculite.
- 3) Mineral fiber, hydraulic-setting insulating and finishing cement.

G. Adhesives: MIL-A-3316C, Classes 1 and 2, Grade A. Low VOC.

H. Jackets shall be adjusted for the application.

- 1) Piping: PVC at AHU's to 8'-0' AFF.
- 2) Exterior Piping: 016 thick aluminum jacketing for all pipe systems
- 3) Equipment: Foil
- 4) Ductwork: Foil or PVC as noted on drawings

2.2 APPLICATIONS

A. PIPING INSULATION

- 1) Refrigerant Suction Piping 1"

B. DUCT INSULATION

- 1) Concealed Ductwork
 - a) Insulated exterior of all supply ducts and outdoor air intake ducts with 1½" thick foil faced duct wrap with a minimum R- 3.5.
 - b) Insulate exterior of all supply and return air duct in ventilated attic with minimum R-12.
- 2) Exposed Ductwork - Rectangular
- 3) Insulate exterior of all exposed supply ducts, outdoor air intake, and relief ducts with 1" thick foil faced rigid board insulation.
- 4) Interior Duct Insulation
 - a) Insulate interior of exhaust duct and chases as noted on drawings with 1" thick duct liner with green guard certification.

3. PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

- A. Leak test piping and ductwork system before installing insulation systems.

3.2 INSTALLATION

- A. Install material in accordance with manufacturer's recommendations, in conformance with building codes and industry standards and "commercial and Industrial Insulation Standards."
- B. Provide external insulation on all round ductwork connectors to ceiling diffusers and on top of diffusers as indicated in the Ductwork Insulation Application and Thickness Schedule and the Drawings. Secure insulation to the top of ceiling diffusers with UL181B-FX listed polypropylene duct tape. Do not insulate top of ceiling diffuser if it is used in ceiling return air plenum or in an open space with no ceiling.
- C. Duct Liner application for interior of return air sound boots:
 - 1) Secure insulation with 100 percent coverage of duct liner adhesive, pins and clips not more than 18 inches on center.

- 2) Secure bottom of duct insulation using alternate single and double clips. The first pin will secure the insulation and the second clip will be used to secure the cladding. Isolate the exterior clip from the cladding by using two 1/8 inch closed cell neoprene (Armaflex) washers on either side of the cladding. Predrill holes in cladding and avoid contact with pin during installation.
 - 3) For round duct, secure insulation with 100 percent coverage of duct liner adhesive. Secure cladding with 3/4 inch, 0.020 inch stainless steel bands on 12-inch centers.
 - 4) For joints and overlaps, fold cladding to form a double thickness hem 2 inches minimum. Seal with a non-shrink, non-hardening sealing compound.
- D. Provide fungicidal coating in air handlers ten feet on either side, first ten feet downstream of cooling coils, ten feet downstream of mix boxes, in mechanical rooms or as otherwise specified in potentially high humidity areas in the duct system shall be coated with an fungicidal coating; EPA registered for use in HVAC duct systems at a coverage rate of 80 ft²/gallon
- E. A continuous vapor barrier is required.
- F. Provide 24 gauge insulation shields at piping hanger systems.
- G. Insulate valves and fittings in cold water systems.
- H. Ductwork insulation shall be wrapped in lieu of liner for all applications except for specific sound attenuation means.
- I. Sagging duct insulation will be unacceptable.
- J. All duct sizes are net.
- K. Insulation shall be continuous through sleeves and hangers, except through fire rated walls.
- L. All pipe hangers shall be external of insulation.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Refrigerant piping and accessories.

1.2 QUALITY ASSURANCE

- A. ASME B31.5 Refrigeration Piping latest edition.
- B. UL 207 Refrigerant Containing Components and Accessories.

2. PART 2 - PRODUCTS

2.1 REFRIGERANT PIPING

- A. Hard drawn, Type “ACR” copper tubing (ASTM B88), cleaned, and capped.
- B. Insulation: Refer to Section 23 07 00

2.2 FITTINGS

- A. Wrought copper or wrought bronze fittings, (ANSI B16.22) with joints brazed.

2.3 BRAZING ALLOYS

- A. 45% silver/phosphorous or silver/zinc alloys with a melting point greater than 1,000 deg. F.
- B. Acceptable Manufacturers: Sil-Fos by Handy Harmon, Aircosil by Airco Welding Products, or ESAB Allstate.

2.4 SERVICE VALVES

- A. Henry Type 203.

2.5 ACCESSORIES

- A. Liquid line dryer, expansion valve, sight glass, charging valves, if not packaged with units.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Route suction and liquid lines from condensers to respective equipment. All lines shall be concealed unless noted otherwise.

- B. Line sizes shall be per manufacturer's recommendations per length from condensing unit to evaporator.
- C. Provide sight glass, filter/dryer assemblies, moisture indicators, thermal expansion valve and solenoid valves for each refrigeration circuit.
- D. Pressure test refrigerant piping system at 300 psi for high side and 150 psi for low side.
- E. Maintain pressure for a minimum of 24 hours.
- F. Leak test piping and joints with an electronic or halide leak detector.
- G. Evacuate entire system with an approved high vacuum pump system to 500 microns.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Low pressure supply (2-inch wg pressure class) sheet metal ductwork.
- B. Low pressure return, relief and exhaust (2-inch wg pressure class negative) sheet metal ductwork.

1.2 QUALITY ASSURANCE

- A. SMACNA HVAC Duct Construction Standards-Metal and Flexible.
- B. UL181.
- C. NAIMA AH124-94: Fibrous Glass Duct Liner Standard.
- D. NFPA 90A and 90B.
- E. ASHRAE Handbook, HVAC Systems and Equipment.

2. PART 2 - PRODUCTS

2.1 STEEL DUCTWORK

- A. SMACNA Section I. Galvanized steel, 24 ga. through 16 ga., intermediate reinforcing bracing, slip joints, mechanical formed seams, beaded, and cross-broken.
- B. Elbows, Branches, Transitions, Offsets: SMACNA Section II. Round duct fittings shall be conical with scoops at branch takeoffs. Round elbows shall be 3-piece type.
- C. Turning Vanes: Tuttle & Bailey "Duct-Turns." SMACNA Section II, Fig. 2-3. Double- thickness airfoil.
 - 1) Other Acceptable Manufacturers: Approved equal by Titus or Anemostat.
- D. Equipment Casings, Flexible Connections, Curbs, Plenum Access Doors: SMACNA Section VI.
 - 1) Hangers, Attachments, and Supports: SMACNA Section IV.

2.2 FLEXIBLE DUCTWORK AND FLEXIBLE DUCT CONNECTIONS

- A. Flexible Ductwork:
 - 1) Contractor-fabricated insulated round rigid sheet metal ductwork for

branch runouts with insulated flexible duct connections to diffusers (maximum 5 ft. long flexible duct).

- 2) Option to insulated rigid round ductwork: Flexmaster Type TL-V. Pre-insulated, semi-rigid, triple-lock, aluminum, flexible, round ductwork for branch runouts and connections to diffusers. 6 in. pressure rating.
- 3) Flexible duct connections to diffusers (maximum 5 ft. long): Flexmaster Type 3M. Insulated with a trilaminate of aluminum foil, fiberglass, and aluminized polyester. Fire-retardant-reinforced aluminum outer jacket. 12 in. positive pressure rating.
- 4) UL 181 Class I, shall not exceed 25 Flame Spread and 50 Smoke Developed.

- B. Flexible Duct Connections: Ventfabrics “Ventglas.” 30 oz. neoprene-coated glass fabric.

2.3 DUCT SEALER

- A. Acceptable Manufacturers: United McGill Corporation “United Duct Sealer” or approved equal by Hardcast or Foster.

2.4 DAMPERS

- A. Refer to Section 23 33 00 for extractors, splitter-dampers, volume dampers, backdraft dampers, and motorized control dampers.

2.5 DUCT ACCESS DOORS

- A. Ward Industries. Constructed of corresponding metal, minimum 22 ga. with felt stripping or foam rubber gasketing, and completely airtight. Provide QUICK-OPENING LATCHES OR WING NUTS.

- 1) Rectangular door equal to width of duct minus 1 in. in one direction, and at least 12 in. in the other direction for access to motorized, or fire dampers. Larger size, if noted.

2.6 FINISHING

- A. Exposed round or rectangular ductwork in finished spaces shall be coated with Glidden #5229 galvanized primer or provided with “paint grip” primed by the Contractor for field painting. Provide (primed) sheet metal escutcheons wherever ductwork penetrates a finished wall surface.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. This contractor shall furnish and install the complete low pressure ducting system, return air and exhaust air systems, outside air intake ducting, required flashing, hangers, etc. as specified herein, shown on the drawings, as may be required to complete the work.
- B. Provide ductwork, including turning vanes, extractors, splitter-dampers, volume dampers, access doors, and flex connections, for the following:
 - 1) Outside air.
 - 2) Supply air.
 - 3) Return air.
 - 4) Exhaust air:
- C. Ductwork layout is schematic; provide risers, drops, offsets around obstructions, flattened sections, etc., and all fittings as necessary to install the ductwork.
- D. Contractor shall coordinate size and location of ductwork with structure, piping, lighting, equipment, cable trays and clear height above ceiling and other areas of potential conflict.
- E. All duct sizes are net.
- F. Round duct may be substituted for rectangular duct where space permits.
- G. Duct work shall not be run over electrical switch gear or panel boxes.
- H. Keep ductwork tight to underside of structure. Maintain at least 7" clearance between ceiling and duct work.
- I. Provide the flexible connections at ductwork connections to vibrating or rotating equipment, including fans.
- J. Install flexible ducts only at supply diffusers with no 90° bend. Use sheet metal for 90 degree bends.
 - 1) Provide balance damper at each flexible connection at duct main.
 - 2) Flexible ducts shall not sag more than ½" per linear foot.
- K. Flexible ducts shall not be pinched with hangers or supports

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Backdraft dampers, manual volume dampers and balance dampers.

1.2 SUBMITTALS

- A. Submittals are required and shall include material, sizes, quantities, and dimensions.

1.3 QUALITY ASSURANCE

- A. SMACNA HVAC Duct Construction Standards-Metal and Flexible
- B. UL181
- C. NFPA 90A and 90B
- D. ASHRAE Handbook, HVAC Systems and Equipment
- E. ASTM E 477.

1.4 MANUFACTURERS

- A. Ruskin or approved equal by Price, American Warming and Ventilating, Air Balance, Arrow, National Controlled Air, Inc., Cesco, Flexmaster, Honeywell, Johnson Controls, Louvers and Dampers, Tamco, Vent Products, or Airstream.
- B. Manufacturer and Model Number listed under Part 2 shall be considered to be the Design Base Manufacturer and Model Number. Other Acceptable Manufacturers will be permitted, unless specifically excluded.

2. PART 2 - PRODUCTS

2.1 CONICAL TAKE-OFF (FOR ROUND BRANCH DUCTS)

- A. Combination Conical Take-Off / Butterfly Damper: Flexmaster Model FLDE. Spin collar 45 deg. scoop, with butterfly damper with adjustable operator.
- B. Option: Flexmaster Model CBDE. Conical Bellmouth fitting, with butterfly damper with adjustable operator.

2.2 EXTRACTORS (FOR RECTANGULAR BRANCH DUCTS)

- A. Tuttle and Bailey "Vectrols." Steel frame and parallel diverting blades, angle bracket, pivot bearing assembly, worm gear operator, and control shaft.

- B. Other Acceptable Manufacturer: Approved equal by Titus or Amnemostat.

2.3 SPLITTER DAMPER (FABRICATED)

- A. Steel frame and adjustable diverting blades, angle bracket, pivot bearing assembly, worm gear operator.

2.4 BALANCING DAMPERS (VOLUME DAMPERS)

- A. Galvanized steel, steel blades, molded synthetic bearings, locking quadrant with stand-off bracket for insulation.
 - 1) Rectangular for ducts larger than 12 in.: Ruskin Type MD35.
 - 2) Rectangular for ducts 12 in. and smaller: Ruskin Type MD25, single-blade.
 - 3) Round: Ruskin Type MDRS25, single-blade.

2.5 CONTROL DAMPERS (OUTSIDE AIR INTAKE AND EXHAUST ONLY)

- A. Low leakage type, aluminum frame, 6 in. heavy-gauge extruded aluminum airfoil blades, concealed linkage, 1/2 in. hexagonal steel axles, vinyl blade edge seal, molded synthetic bearings, extended 1/2 in. control shaft, motor operator bracket, maximum leakage less than 4 CFM per sq. ft. at 4 in. W.G.
 - 1) Acceptable Manufacturers: Ruskin Type CD-50, American Warming Type VC-29, Vent Products Model 5900, or approved equal by Louvers and Dampers.
- B. Furnish motor-operable dampers. All linkages for operators shall be furnished with dampers.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide all Manual Volume Dampers dampers for adjusting air flow.
- B. Install motor-operable control dampers. Provide low-voltage transformers as necessary.
- C. Provide gravity backdraft dampers where indicated.
- D. Motor operable dampers for exhaust fans shall be furnished with the units.
- E. Provide duct mounted access for all control dampers for inspection and maintenance.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Ceiling mounted exhaust fans.

1.2 SUBMITTALS

- A. Submittals are required and shall include material capacities, quantities, and accessories.

1.3 QUALITY ASSURANCE

- A. Sound Power Level Rating: AMCA 301.
- B. Performance Requirements: AMCA 210.

1.4 MANUFACTURERS

- A. Greenheck, Acme, Penn, or Cook.

2. PART 2 - PRODUCTS

2.1 GENERAL EXHAUST FANS

A. CEILING/INLINE EXHAUST FANS

- 1) Galvanized steel housing, acoustical lining, control/junction box, field-adjustable discharge duct connection with backdraft damper. Inlet duct connection on inline fans.
 - a) Fans: Forward curved centrifugal blower wheel(s) shaft-mounted to permanently lubricated motor. Blower and/or motor resiliently mounted to fan housing.
 - b) Controls: Motor power cord with receptacle plug, fan control as scheduled, unit mounted variable speed controller, or other devices as shown on the Exhaust Fan Schedule.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Supply as scheduled on drawings.
- B. Install per manufacturer's instructions.
- C. Install all fans with flexible connection from fan to ductwork.

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- D. Provide vibration isolators on all suspended fan housings.
- E. Install in accessible locations for maintenance.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Supply air registers
- B. Supply air diffusers
- C. Return air grilles

1.2 SUBMITTALS

- A. Submittals are required and shall be scheduled by room number to include performance material, sizes, quantities, finishes, and accessories.

1.3 QUALITY ASSURANCE

- A. ASHRAE Standard 70 for performance testing
- B. NFPA 90A for installation

1.4 MANUFACTURERS

- A. Price, Titus, Kruger or approved USA manufactured equal.

2. PART 2 - PRODUCTS

2.1 COMPONENTS

- A. Supply Air Registers
 - 1) Rigid steel construction
 - 2) Double deflection louvers
 - 3) Front and rear louvers individually adjustable, horizontal to the front
 - 4) Baked white enamel finish or powder paint white finish
 - 5) Options as listed on drawings and schedules.
- B. Supply Air Diffuser
 - 1) All 18 gauge steel diffuser
 - 2) Solid face panel with curved back pan designed for VAV usage
 - 3) Low profile flange for flush appearance.

- 4) Baked white enamel finish
- 5) Insulate back pan above ceilings in areas with ducted return.
- 6) Options as listed on drawings and schedules.

C. Eggcrate Grille Return Air Grille or Transfer Grille

- 1) 1/2 inch by 1/2 inch by 1/2 inch aluminum grid
- 2) Aluminum border
- 3) Provide frame for appropriate ceiling mounting
- 4) Baked white enamel finish or powder paint white finish
- 5) Options as listed on drawings and schedules.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install at each location shown on the drawings and as scheduled.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Convertible air handlers and accessories

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting the following:
 - 1) Product data indicating dimensions, capacities, and materials.
 - 2) Fan performances including curves.
 - 3) Filter data, mounting method, and performance.

1.3 QUALITY ASSURANCE

- A. Construction standard shall meet NFPA 90A.
- B. Product certification shall comply with AGA/CGA.
- C. Fan performance rating shall comply with AMCA 210.
- D. Coil performance shall comply with ARI 410.
- E. Safety code for mechanical refrigeration shall comply with ASHRAE 15.
- F. Filtration shall comply with ASHRAE 52.

1.4 MANUFACTURERS

- A. Trane, Daikin, York or Ducane

1.5 Equipment Warranties

- A. Full warranty for one year followed by a 10 year limited warranty.

2. PART 2 - PRODUCTS

2.1 COMPONENTS

- A. General
 - 1) Gas fired furnaces shall include models and energy efficiencies (AFUE) OF 95%. Compact cabinet with either side or bottom return air entry shall allow installation in locations specified. Units shall be shipped factory assembled with all controls

installed and wired. Each unit shall be factory test operated to insure proper operation.

B. Heat Exchanger Assembly

- 1) Main 3-pass clamshell type heat exchanger shall be constructed of heavy gauge aluminized steel and is designed for normal expansion and contraction without metal fatigue. Crimped seam design and construction shall provide long service life, maximum efficiency and minimum resistance to airflow. Condenser coil shall be constructed of aluminum fins fitted to stainless steel tubes. Coils shall be factory tested for leaks. Combined flue vent and condensate drain header box assembly shall be located on front of coil. Compact size of complete heat exchanger assembly shall permit low overall design of furnace cabinet. All components shall be mounted in a heavy gauge steel frame. Heat exchanger assembly shall be laboratory life cycle tested.

C. Automatic Gas Control

- 1) Silent operating gas controls shall provide 100% safety shut off. 24 volt redundant combination gas control valve combines automatic safety pilot, manual shut off option (on-Off), pilot filtration, automatic electric valve (dual) and gas pressure regulation into a compact combination control. Dual valve design shall provide double assurance of 100% close off of gas to the pilot and main burners on each off cycle. Gas valve shall be automatically regulated with pressure switch to maintain even gas flow regardless of type of venting installation. Design also shall compensate for variations in altitude.

D. Induced Draft Blower

- 1) Factory installed induced draft blower shall prepurge heat exchanger and shall safely vent combustion products. Shaded pole motor shall be thermally protected. It shall operate only during heat demand cycle. A pressure switch shall prevent unit operation in case of blockage of combustion air, flue outlet or condensate drain.

E. Cabinet

- 1) Cabinet shall be constructed of heavy gauge cold rolled steel. Cabinet shall be subject to five station metal wash process resulting in a perfect bonding surface for paint finish of baked-on enamel. The paint solution and metal shall be given opposite electrical charges resulting in positive adhesion and even coverage of the paint to the metal surfaces. Cabinet surface temperatures shall be low due to foil faced fiberglass insulation on vestibule panel, side panels and on back panel. Blower compartment sides and rear shall be completely lined with black matt faced fiberglass insulation, assuring quiet operation. Complete service access shall be accomplished by removing heating section and blower compartment access panels. Blower assembly and filter shall be completely removed from unit for service. Blower deck shall have rails that angle down for easy blower removal. Safety interlock switch located in the control box shall automatically shut off power to the unit when blower compartment access door is removed. Intake and exhaust air openings shall be

furnished on top of furnace. Gas piping and electrical inlets shall be provided in both sides of the cabinet. Return air entry shall be possible on either side or bottom of cabinet. For bottom return air, cabinet shall have a perforated knockout pattern for easy removal.

F. Field Wiring Make-up Box

- 1) Make-up box shall be furnished for line voltage wiring. Box may be installed on either side of furnace, internally or externally to unit. Box shall contain plug-in connection for power supply wiring, wire for 120 volt accessory connection and all necessary hardware for installation.

G. Transformer

- 1) 24 volt control transformer shall be furnished as standard equipment and shall be factory installed in control box. Transformer shall have circuit breaker wired in series for added protection.

H. Blower

- 1) Units shall be equipped with quiet multi-speed direct drive blowers. Each blower assembly is statically and dynamically balanced. Multiple-speed leadless motor shall be resiliently mounted. Blower speeds shall be easily changed at the harness connector on the blower motor. See blower performance tables.

I. Air Cleaner

- 1) Air filter shall be equal to Air Bear 5" media MERV 13 with metal housing for bottom or horizontal furnace return.

3. PART 3 - INSTALLATION

- 3.1 Install furnaces in locations as shown on the drawings.
- 3.2 Set on ribbed or waffled neoprene pad. Mason Industries Type W.
- 3.3 Provide duct required for 5" filter system.
- 3.4 Provide 7-day programmable thermostat for heating and cooling and fan cycle function.

◆ END OF SECTION ◆

SECTION 23 62 13
REFRIGERANT CONDENSING UNITS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Air-cooled refrigerant condensing units with single 2-stage compressor.

1.2 SUBMITTALS

- A. Submittals are required and shall include product data noting capacities at the specified conditions, materials, sizes, and dimensions.

1.3 QUALITY ASSURANCE

- A. ASHRAE Standard 15.
- B. Certified performance to ARI 210/270/340.
- C. UL construction.
- D. Units must meet minimum efficiency requirements of ASHRAE Standard 90.1-2019.

1.4 WARRANTY

- A. Compressors shall include an extended 5-year parts warranty.

1.5 MANUFACTURERS

- A. Trane, Daikin, York or Lennox.

2. PART 2 - PRODUCTS

2.1 COMPONENTS

A. AIR-COOLED UNITS

- 1) This Contractor shall furnish and install condensing unit as shown on the drawings and as specified herein.

B. CASING

- 1) Unit casing is constructed of heavy gauge, galvanized steel, and painted with a weather-resistant powder paint.

C. GENERAL

- 1) The condensing unit shall be fully charged from the factory for matched indoor section and up to 15" of piping. Unit is designed to operate at

outdoor ambient temperatures as high as 115 Degrees Fahrenheit cooling capacities are matched with a wide selection of air handlers and furnace coils that are AHRI certified.

- 2) Refrigeration system controls include condenser fan and compressor contactor. High and low pressure protection are inherent to the compressor. A factory installed liquid line drier and low pressure switch are standard. Field braze connections are externally accessible multi-use liquid and gas line valves, with service pressure gauge ports.
- 3) Neoprene-in-shear vibration isolators will be included to reduce transmission of noise and vibration to building structures, equipment and adjacent space.
- 4) The outdoor coil provides low airflow resistance and efficient heat transfer. The coil is protected on all four sides by louvered panels.

A. COMPRESSOR

- 1) Refrigeration System - Single Unloading
 - a) The Climatuff® 2-stage compressor features internal over temperature and pressure protection and hermetic motor. Other features include: centrifugal oil pump and modular plugs for electrical connections.
 - b) Unit shall have a single refrigeration circuit. Each refrigeration circuit has an integral subcooling circuit. A refrigeration filter drier shall be provided as standard. Unit shall have both a liquid line and suction gas line service valve with gauge port.

B. CONDENSER COIL

- 1) The Spine Fin coil is continuously wrapped, corrosion-resistant, all aluminum with minimum brazed joints. This coil is 5/8" O.D. seamless aluminum, glued to a continuous aluminum fin. The coil is protected on all four sides by louvered panels.

C. CONDENSER FAN AND MOTOR

- 1) Direct-drive, statically and dynamically balanced 26 or 28 inch propeller fan with aluminum blades and electro-coated steel hubs shall be used in draw-through vertical discharge position. Either permanently lubricated totally enclosed or open construction motors shall be provided and shall have built in current and thermal overload protection. Motor shall be either ball or sleeve bearing type.

2. PART 3 - EXECUTION

2.1 INSTALLATION

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- A. Install unit as shown on drawings in strict accordance with manufacturer's instructions including refrigerant piping.
- B. Install refrigerant piping and specialties to evaporator coil in strict accordance with manufacturer instructions.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 GENERAL REQUIREMENTS

- A. The Instructions to Bidders, General Conditions, Supplemental General Conditions, Special Conditions, Addenda, these Technical Specifications and the Drawings, together with the Contract and Proposal, comprise the Contract Documents for the Electrical Contract.
- B. Refer to the General Requirements and Divisions 22, and 23 as many of the General Requirements stated therein are applicable to the electrical work.

1.2 SCOPE OF WORK

- A. This contract shall consist of all work specified in Division 26, 27, and 28 of this specification or as called for in the electrical drawings. Also included in this contract are any additional materials required by manufacturers of specified products or approved equals to complete the electrical installation. In addition, this contract includes all material and labor necessary in accordance with all applicable codes to complete the total electrical project as shown or implied by the electrical drawings and specifications.
- B. This scope includes all new work.

1.3 SITE VISIT

- A. Each bidder shall visit the job site or sites and review the conditions to satisfy himself that these drawings and specifications are accurate. If any discrepancies are discovered, the Architect should be notified at least 72 hours prior to bid opening.

1.4 LAYOUT OUT OF WORK

- A. This Contractor is responsible for laying out his work so that all equipment and devices are located in the proper location and at the proper height. All mounting heights and locations shall be as specified in this specification unless they conflict with ANSI handicap accessibility standards. In which case, ANSI standards shall govern.
- B. When laying out raceways, this Contractor shall verify that his equipment does not conflict with equipment by other Contractors, especially sanitary and storm lines. Electrical raceways shall be routed around all sanitary and storm lines.
- C. The Electrical Contractor shall inspect the architectural floor plans to verify that all new switches are located on the latch side of door openings. If there are any significant conflicts, the Architect should be notified prior to installation of such devices.

1.5 WORKMANSHIP

- A. All work shall be done in accordance with the latest standards and practices. Work shall be performed by skilled journeyman electricians under the supervision of a competent foreman. Any work installed by an apprentice electrician or laborer shall only be done so under the supervision of a journeyman electrician.
- B. All excessive holes caused by this Contractor shall be repaired at this Contractors expense, when directed so by the Architect.
- C. Conduit in newly constructed walls must not be exposed.
- D. Unless otherwise noted all equipment installed by this Contractor shall be new and complete with all accessories necessary to complete the installation.

1.6 INSPECTION

- A. All work shall be inspected by inspection department having jurisdiction.
- B. Upon completion of the work, this Contractor shall furnish to the Owner and Architect a certification of inspection and approval from said Bureau before final payment on contract will be allowed.
- C. Permit and Plan Approval will be provided by the Architect, and paid for by the owner. Any additional permits required will be submitted and paid for the respective contractor. Re-inspection fees will be the responsibility of the electrical contractor.

2. PART 2 - DOCUMENTS

2.1 DRAWINGS & SPECIFICATIONS

- A. Electrical work for this contract can be found on the electrical drawings and Divisions 26, 27, and 28 of this specification. However, each bidder shall review the architectural, structural, mechanical drawings, and Divisions 22, and 23, of the specification for additional work. These drawings are diagrammatical and exact location of all electrical devices shall be field verified.
- B. The Contractor shall review all addenda prior to beginning construction. Any changes called for in bidding addenda shall be implemented at no additional cost to the Owner. In addition, this Contractor shall furnish any additional items necessary to complete the project as called for in the drawings and specifications even though they may not appear on such. For example, additional junction boxes, conduit, etc. Finally, any quantities that appear in the electrical legend are to aid the bidder. The Contractor shall supply the correct quantity as shown on the drawings or called for in the specification.
- C. If there is any inconsistency between the drawings and specifications, the cost estimate should be based on the scenario with the highest cost. The contractor is responsible for submitting a Request for Information.

2.2 APPROVAL DRAWINGS

- A. This Contractor shall submit approval drawings for all custom built or special purpose equipment, including but not limited to all items listed below.
- B. Manufacturers catalog cuts are acceptable for the following items:
 - √ Lighting Fixtures
 - √ Wiring Devices
 - √ Switch Gear
 - √ Occupancy Sensors
 - √ Safety Switches
 - √ Voice and Data System
 - √ Motor Starters
 - √ Panel Boards
 - √ Surge Suppressors
 - √ Circuit Breakers
 - √ Transfer Switch
- C. Any devices that require color selection shall have approval drawings complete with color charts.
- D. The Electrical Contractor shall verify, stamp and initial all shop drawings "approved."
- E. This approval shall include items such as voltage selection when the manufacturer requires this information. After the Contractor approves the shop drawings, he shall submit them to the Architect for final approval.
- F. Upon review and approval of the drawings, the Architect will retain one copy and return the remaining copies back to the Contractor.
- G. The Architect's approval of the shop drawings does not relieve the Contractor of his responsibilities if the manufacturer's drawings are not complete or deviate from the drawings and specifications. Any acceptable deviation from the original specifications and drawings must be approved by the Architect in the form of a letter.

2.3 AS BUILT DRAWING

- A. Contractor shall keep an accurate record of all deviations from contract drawings and specification. He shall neatly and correctly enter in colored pencil any deviation on drawings affected and shall keep drawings available for inspection. Extra set of drawings will be furnished for this purpose.

- B. At completion of job and before final approval, make any final corrections to drawings and certify to the accuracy of each print by signature thereon and deliver same to Architect.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Perform all work in accordance with the latest edition of the National Electric Code as issued by the National Fire Protection Association International, National Electrical Safety Code, Standards of the National Bureau of Fire Underwriters', and any local codes or ordinances.
- B. The Architect will provide state plan approval and building permit. Contractor shall pay for and obtain any other local permit.

3.2 CLEANING AND FINISHING

- A. After all tests have been completed and approved by the Architect and Owner, this Contractor shall clean all fixtures and equipment. This shall include the removal of all stickers and markings from fixtures, cabinets, conduits and other equipment.

3.3 GUARANTEE AND WARRANTY

- A. This Contractor shall guarantee is workmanship and material for a period of one year from the date of final acceptance and leave his work in perfect order at completion. Should defects develop within the guarantee period, the Contractor shall, upon notice of same, remedy the defects and have all damages to other work or furnishing caused by the defects or the work of correcting same repaired and/or replaced at his expense, to the condition before such damage. The date of final acceptance is defined as the date of signature by the Owner on the final payment of this Contract.

3.4 EQUIPMENT IDENTIFICATION

- A. Provide name plates on all equipment on the type listed in the following schedule:
 - √ Switchgear
 - √ Safety Switches
 - √ Control Devices
 - √ Panel Boards
- B. Lettering shall include name of equipment, the specific unit number, and any reference to on-off or other instructions that are applicable.
- C. The space between lines shall be equal to the width of the letters. Use ¼" minimum height letters which occupy four to the inch.

3.5 PERSONNEL INSTRUCTION

- A. Provide a minimum of 8 hours instruction to personnel selected by Owner for operation of building electrical system. This is over and above specialized systems listed elsewhere in this specification. Instructions shall include the following:
- B. Show location of items of equipment and explain what they do.
- C. Refer to operating instruction manual for record and clarity.
- D. Coordinate written and verbal instructions so that each is understood by personnel.
- E. Confirm to the architect that the instruction session has been carried out and provide a record of those who were present.

3.6 TESTS

- A. Contractor shall conduct such tests and adjustments of equipment as required by Architect or necessary to verify performance requirements. Submit data taken during such tests to Architect. Contractor shall pay all professional engineering fees involved in required testing of equipment. Electrical Contractor shall megger test any or all feeders or branch circuits as required or described by the Architect.
- B. All signaling systems, such as fire alarm, variable speed drives, and intercom shall be checked out and tested by qualified field representative or equipment vendor. A report shall be submitted to the Architect by vendor representative indicating results of such final check out and tests. Final payment will not be approved until such report is submitted.

3.7 LOAD BALANCE AND ADJUSTMENT

- A. This Contractor shall furnish personnel and equipment and insure that building power, lighting, motor and appliance loads are balanced between phases of service entrances, distribution feeders and/or transformers as closely as possible.
- B. Special care shall be taken during load balance to ensure that reverse rotation of motors is not caused.

◆ END OF SECTION ◆.

SECTION 26 00 60
TEMPORARY LIGHTING AND POWER

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Temporary lighting and power

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in compliance with the National Electrical Code.
- B. Underwriter's Laboratory
 - 1) Materials utilized shall be UL listed.
- C. Occupational Health and Safety Association
 - 1) Comply with all applicable OSHA standards.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Ground fault circuit breakers.
 - 1) Temporary power and lighting circuits shall be protected by ground fault circuit breakers.
- B. Main panelboard with disconnect.
 - 1) Provide temporary service with main disconnect in accordance with Section 01 50 00 of the specifications.
- C. Temporary lighting.
 - 1) Provide temporary lighting in accordance with Section 01 50 00 of the specification.
- D. 120 volt receptacles with overcurrent protection.
 - 1) Provide temporary power outlets in accordance with Section 01 50 00 of the specifications.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Electrical Contractor shall provide and maintain temporary electrical service as required to provide power and lighting for construction purposes. See Section 015000 for additional information.
- B. Provide grounding of temporary service in accordance with NEC requirements.
- C. Ground temporary branch circuit for lighting and power.
- D. No temporary wiring, fittings, receptacles, or light fixtures may be used for permanent wiring. All temporary lighting and wiring shall be removed at the completion of the project.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SCOPE

A. Base Bid

The Electrical Contractor shall coordinate his efforts with AES Ohio in order to provide a new 200 amp – 120/240-volt 1 phase underground electrical service to the new Park Office building.

2. PART 2 - PRODUCTS

2.1 MATERIALS

A. See appropriate specification sections.

3. PART 3 - EXECUTION

3.1 WORK BY ELECTRICAL CONTRACTOR

A. Underground secondary feeder conduits will be by the Electrical contractor and shall be placed approximately 24" below ground level unless noted otherwise. All 90° sweeps shall be steel. Conduits under paved surfaces shall be concrete encased. Provide weather tight cap at exposed ends of conduits until ready for use.

- 1) Electrical contractor shall install (1) 3" conduit from utility pedestal to a new meter and 200 AMP Service Disconnect Switch. Place conduits 24" below grade with warning tape.
- 2) Electrical contractor shall provide and install new meter meeting Electric Utility specifications.
- 3) Provide and install 3 – #3/0 feeders in the secondary conduit from the utility pedestal to new meter and 200-amp disconnect switch.
- 4) Concrete encase raceway under new pavement.
- 5) Provide rigid 90's.
- 6) Install meter and conduit per utility requirements.

3.2 WORK BY UTILITY ELECTRIC COMPANY

- A.** AES Ohio shall provide the new pole mounted transformer, on an existing pole.
- B.** Contractor is responsible for all coordination with utility.

◆ END OF SECTION ◆

SECTION 26 05 11
EQUIPMENT HOOK-UP AND FINAL CONNECTION

1. PART 1 GENERAL

1.1 DESCRIPTION

- A. Coordinate the electrical requirements of equipment with the Supplying Contractor or Manufacturer.
- B. Provide plug-in or rough-in and final connection for each piece of equipment requiring power, including, but not limited to, the following:
 - 1) Owner furnished equipment.

◆ END OF SECTION ◆

LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Building wire and cable for wiring systems of 600V or less
- B. Connectors for power systems 600V and less.

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with the National Electrical Code.
- B. Underwriter's Laboratory
 - 1) Materials utilized shall be UL listed where applicable.
- C. 600V Insulating material NEMA WC70.
- D. Copper conductors NEMA WC 70.
- E. Conductor Connection Torque Value UL 486A.

2. PART 2 - PRODUCTS

2.1 CABLE AND WIRING - 600V OR LESS

- A. All conductors shall be soft drawn copper conforming to ASTM specifications and the latest edition of the NEC.
- B. Wire size, insulation type and manufacture shall be clearly identified on the wire jacket.
- C. Wire and cable shall be rated 600V.
- D. On 120/240-volt, single phase systems, phase wires shall be black and red. The neutral wire shall be white
- E. On this system the equipment ground shall be green or taped completely green at all accessible points.
- F. Grounding conductors larger than No. 8 may be taped with color coded tape at the following locations:
 - 1) At each terminal
 - 2) At each conduit entrance

3) At 12 in. intervals in all accessible points.

- G. Utilize Type THHN/THWN, 90° C for lighting branch circuits and general use.
- H. Provide #10 AWG branch conductors where distance from panel to last outlet exceeds 70 ft. for 120V and 100' for feeders or branch circuits in extremely hot locations where ambient temperatures are 90°C.
- I. Cords for makeup connections to equipment shall be 600 volt, heat resistant, rubber insulated, portable cable with neoprene jacket type "SO" and "W" of extra flexible stranded copper.

2.2 CONNECTORS FOR POWER SYSTEMS 600v OR LESS

- A. Insulated connectors.
 - 1) Shall be equal to Minnesota Mining and Manufacturing Company Scotch Locks.
 - 2) Similar products such as Wing-Nuts by Ideal Company or equal products by T & B Co. are approved.
- B. Compression type connectors

2.3 MANUFACTURED WIRING SYSTEMS

- A. Pre-manufactured, re-locatable, integrated electrical branch wiring system for lighting in accessible ceilings.
- B. Minimum No. 12 AWG copper wire with 600-volt, 90 degree insulation.
- C. Minimum No. 12 AWG insulated copper ground wire.
- D. Pin and socket contacts connected to branch circuit conductor.
- E. Metal constructed cable heads with corrosion-resistant heads.
- F. Designated so no interconnection can occur between different electrical voltages.
- G. System shall be completely modular in construction incorporating conversion modules, pre-fabricated receptacles located in top of light fixtures, modular selector cables for connecting to light fixtures, and cable extenders.
- H. System shall be capable of being manufactured to conforming to light switching arrangements required.

2.4 PLUG CONNECTED CABLE

- A. Flexible cord for short connection to equipment shall be 600 volt, heat-resistant, rubber insulated portable cable with neoprene jacket, UL Type "ST" or "SRDT."

Cord shall be extra-flexible stranded copper with ground conductor. Provide termination plug as required.

- B. Flexible cable is NOT permitted for motor connections.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Perform work in accordance with NEC requirements.
- B. Utilize recognized Industry Standard practices and equipment for pulling wire through raceways.
- C. Utilize wire ties in panelboards and cabinets to neatly organize and restrain cables.

3.2 COPPER CONDUCTOR PERFORMANCES

- A. Type THHN/THWN or XHHW in raceway for service entrance wiring.
- B. Type THHN/THWN in raceway for feeders and branch circuits.
- C. Type THHN/THWN for exterior branch circuits.
- D. Minimum conductor size shall be #12 AWG for power circuits, #14 AWG for controls.
- E. Feeders and branch circuits shall be concealed above ceilings, in walls, chases, and below slab-on-grade.
- F. Manufactured wiring system installation shall be limited to wiring between light fixtures located in accessible acoustical tile ceilings and from junction box located above ceiling to fixtures. Conduit shall be provided from light fixture switch location to junction box located above ceiling.

3.3 CONNECTION PERFORMANCES

- A. Splices in conductors #10 AWG and smaller wire shall be made with Minnesota Mining and Manufacturing Company insulated "Scotch Locks", Ideal Company "Wing nut", or Thomas & Betts Type "PT" connectors, or with mechanically crimped sleeves as manufactured by Thomas & Betts or Ideal Company, which shall be insulated with pressure-sensitive electrical tape equal to Minnesota Mining and Manufacturing Company "Scotch 33+."
- B. Splices in conductors #8 AWG and larger shall be made with pressure type mechanical connectors and insulated with (2) layers of insulating putty and (2) layers of "Scotch 88" tape. This shall have a minimum of 150% of the insulating value of the conductor insulation.

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◆ END OF SECTION ◆

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Basic requirements for grounding for protection of life, equipment, circuits, and systems
- B. Requirements for grounding low voltage systems and equipment.

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with the National Electrical Code.
- B. UL 467
- C. Bare solid copper conductors ASTM B3.
- D. Bare stranded copper conductors ASTM B8.

2. PART 2 - PRODUCTS

2.1 MATERIALS

- A. Minimum No. 12 AWG 600V insulated copper equipment grounding conductor insulated with green colored insulation.
- B. Stranded cable grounding electrode conductors.
- C. Bare copper conductors.
- D. Grounding bus consisting of bare annealed 1/4 inch by 2-inch copper bars of rectangular cross section.
 - 1) All panelboards and disconnect switches shall be equipped with grounding bus bars, sized in accordance with manufacturers' recommendations.
- E. Braided No. 4 AWG bare copper wire bonding jumpers.
- F. Copper clad steel 3/4 inch grounding rods.
 - 1) New ground rod shall consist of two 3/4" diameter by 10'-0" long copper weld ground rods. New ground rods shall be bonded together to form a grid. New ground rods shall be spaced 6'-0" apart and 3'-0" from building.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Conduit is not an allowable grounding means. A continuous grounding conductor shall be required in all raceways, sized as shown on plans and in compliance with NEC requirements when not noted.
- B. Provide grounding of circuits, equipment, conduits and etc. as required by the NEC.
- C. Ground all conduit, cabinets, meters, panels, fixtures, and other exposed non-current carrying metal parts of electrical equipment in accordance with all provisions of the National Electrical Code.
- D. Use bare stranded copper for all grounding conductors. Where the potential exists, that the grounding conductor may be subject to damage, the grounding conductor shall be encased in a metallic raceway. The size of all grounding conductors shall conform to the National Electric Code, unless a larger size is shown on the drawings.
- E. All metallic conduit systems shall be electrically continuous throughout and shall be grounded at the service entrance.
- F. All cord connected appliance frames shall be grounded at the conduit system through a grounding conductor in the cord.
- G. Install green bounding jumper between the outlet box and the receptacle grounding terminal on all receptacles.
- H. Ground the main service entrance equipment to main water line in mechanical room. The grounding conductors shall be #4 copper run in 1" conduit.
- I. Also furnish and install a new #4 copper grounding conductor from main service entrance equipment to new ground rods located three feet outside of building foundation, east of building.
- J. Bond new service ground to reinforcing bars in foundation with #6 copper grounding conductor.

◆ END OF SECTION ◆

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Hangers and supporting devices for electrical components

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in compliance with the National Electric Code.
- B. Underwriter's Laboratory
 - 1) Materials utilized shall be UL listed, where applicable.

2. PART 2 - PRODUCTS

2.1 GENERAL

- A. Hangers shall be individual steel ring or clevis type hangers
- B. Corrosion resistant finish in corrosive environments is required.
- C. Concrete inserts shall be rated per load for attachment to concrete
- D. Malleable iron C-clamp and retaining clip shall be utilized for attachment to steel beams
- E. Ring and turnbuckle attachment shall be utilized for steel pipe
- F. Trapeze hangers with clamps and hanger rods shall be utilized for parallel pipe runs.

2.2 MATERIALS

- A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.
- B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.
- C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fitting, designed for types and sizes of raceway or cable to be supported.
- D. Structural Steel for Fabricated Supports and Restraints: ASTM A 36/A 36M, steel plates, shapes, and bars; black and galvanized.

E. Mounting, anchoring, and attachment components:

- 1) Powder-actuated fasteners: threaded-steel stud
- 2) Mechanical-expansion anchors; Insert-wedge-type, zinc-coated steel
- 3) Concrete inserts: steel or malleable iron
- 4) Clamps for attachments to steel structural elements
- 5) Through bolts; structural type, hex head, and high strength
- 6) Toggle bolts; all-steel springhead type
- 7) Hanger rods; threaded steel

3. PART 3 - EXECUTION

3.1 GENERAL

- A. The electrical contractor shall supply all necessary items to support all equipment and devices provided by this contractor. All supports shall be in accordance with the NEC guidelines.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Conduit
- B. Conduit Fittings
- C. Outlet and device boxes
- D. Pull boxes and accessories

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with NEC requirements.
- B. Underwriter's Laboratory
 - 1) All material shall bear U.L. Label.
- C. Rigid Metal Conduit (RMC) ANSI C80.5.
- D. Electrical Metallic Tubing (EMT) ANSI C80.3.
- E. Liquid tight Flexible Metal Conduit UL 360.
- F. Underground Polyvinyl Chloride (PVC) NEMA TC9
- G. NEMA OS 2 and UL 514A

1.3 GENERAL

- A. Provide boxes for devices, lighting fixtures, motors and equipment connections, system equipment connections, and special outlets. Provide pull boxes where more than (4) 90-degree bends are required or if conductors are pulled further than 100 ft.
- B. Unless otherwise noted, all conductors shall be enclosed in a continuous, grounded, steel conduit or raceway.
- C. The conduit system shall be made mechanically tight and electrically continuous throughout. Conduit system shall be grounded at the service entrance.
- D. Use galvanized steel conduit. Exception: Conduit exposed outside shall be rigid aluminum. No aluminum conduit is permitted inside or encased in concrete.
- E. Schedule 40 PVC and Schedule 80 HDPE conduit is permitted underground with limitations or, under certain conditions, below slabs.
- F. Minimum Size: ½ in. for control and low voltage wiring only; ¾ in. for line voltage wiring; 1 in. minimum below slab or underground, except as otherwise indicated.

2. PART 2 - PRODUCTS

2.1 BOXES

- A. All outlet boxes shall be galvanized pressed steel of standard knockout type.
- B. Lighting outlet boxes shall be standard 4 in. octagonal, 1 1/2 in. minimum deep boxes with 3/8 in. fixture-mounting stud. Outlet boxes having more than (2) conduits, or when 3/4 in. conduit is used, shall be standard 4 in. square boxes 1 1/2 in. deep or deeper as might be required to accommodate the wiring contained therein.
- C. Flush device boxes in masonry walls shall be masonry boxes designed for the purpose, or 4 in. square boxes with raised covers designed for masonry.
- D. Wiring device boxes for surface conduit work and those located in potentially damp areas shall be FS Series cast boxes. Exterior exposed boxes shall be weatherproof or water-tight with gaskets.
- E. Where outlet boxes are cast in concrete slabs, they shall be designed for concrete installation.
- F. Flush device boxes in plaster or drywall construction shall be 4 in. square, 2 1/8 in. deep boxes or gangable 2 1/2 in. deep boxes. Shallow 1 1/2 in. deep gangable boxes may be used only in demountable partitions and in other walls too thin for standard depth boxes.
- G. Boxes shall be large enough to accommodate the size and number of conduits secured thereto and the size and number of wiring conductors.
- H. All fittings, covers, and hardware shall be galvanized steel.
- I. Furnish narrow boxes for mounting switches in door frames/mullions.
- J. Boxes shall be NEMA type approved for the prevailing environmental conditions.

2.2 OUTDOOR PULL BOXES

- A. Provide grade-mounted, precast polymer concrete, watertight, open bottom, heavy-duty gasketed covers, suitable for occasional non-deliberate heavy vehicle drive-over application, with logo, size as required.
- B. Acceptable Manufacturers: Quazite, Synertech, and Wiegmann.

2.3 CONDUIT SYSTEMS

- A. Use electrical metallic tubing, intermediate metal conduit, or rigid steel conduit, as specified below:
 - 1) Threaded rigid or intermediate conduit is required where conduit is ANY of the following:

- a) 2 1/2 in. or larger.
 - b) Exposed to physical damage.
 - c) Exposed within 8 ft. of finished floor.
 - d) Run in slab or in exterior walls.
 - e) Run in hazardous locations.
- 2) Threaded rigid or intermediate conduit is required where vertical drops are made to equipment in open space. The vertical conduit shall be rigidly supported from the equipment, extend a minimum of 10 ft. above floor level, and be not less than 1 in. diameter.
 - 3) Steel thin-wall EMT up through 2 in. diameter may be used elsewhere in interior construction, where rigid or intermediate is not otherwise required.
 - 4) Schedule 40 PVC conduit may be installed below the ground floor slab WITH 24 IN. MINIMUM COVER. PVC conduit shall terminate below the slab and connect to rigid steel or intermediate metal riser conduit.
- B. Flexible Steel Conduit: Final connections to motors and equipment subject to vibration or moisture shall be made with 3/4 in. flexible steel conduit, 18 in. to 24 in. long, with PVC jacket, and containing copper phase and ground conductors. Connections between recessed lighting fixtures and junction boxes may be installed using 1/2 in. flexible steel conduit not over 72 in. long.
- C. Metallic and nonmetallic surface raceway systems shall be complete with boxes, fittings, elbows, terminations, and all mounting hardware.
- D. Technology Raceway
- 1) From technology outlet box provide one 1" conduit to tech cabinet or 6" above ceiling. Turn toward tech cabinet with plastic bushing. Provide raceways above inaccessible ceiling spaces and in rooms that do not have lay-in ceilings.

2.4 STEEL CONDUIT FITTINGS

- A. Rigid or intermediate conduit fittings shall be threaded. EMT conduit fittings shall be compression type only. Conduit bodies shall be malleable iron, threaded for heavy wall conduit and compression type for EMT, with cadmium finish and cadmium-plated sheet steel covers. Provide neoprene cover gaskets for conduit body covers exposed to the weather.

2.5 LIQUID-TIGHT FLEXIBLE METAL CONDUIT (LTFMC)

- A. LTFMC may be used in short lengths to provide some vibration isolation. Contractor may use 1/2 in. LTFMC in short lengths (5 ft. maximum) to match equipment hubs on such items as motors, damper operators, limit switches, and similar controls where it is impractical to use 3/4 in. fittings.

2.6 BRIDLE RINGS

- A. Provide steel bridle rings for supporting low voltage cable above accessible ceilings.

2.7 CABLE TRAY

- A. Basket: UL-listed, 4 in. deep load depth, 12 in. wide, structural wire mesh, with 4 1/2 in. x 4 1/2 in. openings complete with splices, hold down clips, connectors, and single center support hangers.

3. PART 3 - EXECUTION

3.1 PERFORMANCES

A. GENERAL

- 1) Raceway installation shall comply with NECA 1.
- 2) Minimum conduit size shall be 3/4 inch trade size.
- 3) Conduits shall be sealed where entering refrigerated spaced.
- 4) Minimum size of flexible conduit shall be 1/2 inch trade size.
- 5) Extend exposed raceways parallel and perpendicular to the surface of exposed structural members and surface contours as much as practical to provide a new appearance. Space of clamps or hangers support conduit shall not be greater than the following:

Conduit Sizes in Inches	Max Spacing of Support in Feet	
	Horizontal	Vertical
3/4"	7'	7'
1" & 1 1/4"	10'	8'
1 1/2" & 2"	10'	10'

- 6) A support shall be provided for exposed or concealed raceway as close as practical to and not exceeding 1' from an unsupported box or access fitting. In horizontal runs, a support at a box or access fitting may be omitted when the box or access fitting is independently supported and the raceway terminal is not made with a chase nipple or threadless box connector. In vertical runs, the load produced by the weight of the raceway and the enclosed conductors shall not be carried by the raceway terminal but shall be carried entirely by the conduits supports.
- 7) Maintain 6" from paralleled hot water piping and 4" from cross runs. Support conduits by Minerallac or approved galvanized pipe brackets securing to hollow masonry units with toggle bolts, concrete or brick with expansion bolts, metal surfaces with machine screws and wood construction with wood screws.

- 8) Conduits shall not be secured to other piping, duct work or other mechanical equipment except where specifically directed. Conduits will be permitted on pipe swings of other trades when so arranged with the other installing Contractor.
- 9) Paralleled conduits shall be uniformly spaced using performed channel. Slotted angle iron will be rejected. Groups of conduits to be supported by trapeze hangers at ends of hanger rods.
- 10) Allowable Conduit Usage

CIRCUIT IDENTIFICATION	ALLOWABLE TYPE CONDUIT						
	GRC	IMC	EMT**	RNC*	Flex	W.P.Flex	MC Cable
Underground secondary service entrance conduit	X			X			
Feeders to switchboards, panels, motors, transformers, exposed conduit	X	X	X				
Connections to interior light fixtures & transformers					X		
Connections to motors & motorized equipment, interior & exterior						X	
Underground interior feeder conduit	X	X		X			
Branch circuit wiring from light fixture to light fixture						X	X
Underground exterior branch conduit	X	X		X			
Exposed conduits	X	X	X				
Conduits in metal stud partitions			X				
Conduits buried in block walls	X	X	X				
Conduits above suspended ceilings	X	X	X				
Misc. low voltage systems (fire alarm) up to 4" C size. (EMT not allowed underground or as otherwise limited above)	X	X	X				
Interior above ceiling conduits 3 1/2" and larger except as otherwise permitted.	X	X	X				

* With 3 inch concrete envelope under drives and sidewalks.

** Not approved for exterior or exposed below 8 feet AFF.

3.2 ELECTRICAL METALLIC TUBING

- A. Contractor may option to use U.L. Labeled galvanized electrical metallic tubing (EMT) with a minimum trade diameter of 3/4" at the following locations only:
 - 1) Drywall interior partitions
 - 2) Above suspended ceilings.
 - 3) May be exposed above 8 feet
 - 4) For voice and data system raceways.
 - 5) In mechanical rooms.
 - 6) For security system raceways.
 - 7) For alarm system raceways.

- B. All EMT connections may be with compression type or set screw type fitting. EMT shall be supported in accordance with NEC guidelines.

3.3 NON-METALLIC CONDUIT

- A. Raceways $\frac{3}{4}$ " diameter or larger below slabs may be PVC Schedule 40. Heavy wall, Schedule 40 PVC conduit shall have glued fittings. Raceways bends, offsets, etc. shall be field formed using approved "heat box", etc. No PVC will be permitted above the floor line.
- B. All raceways shall be separated and supported with approved spacers to provide not less than two inch (2") separation the entire length of the raceway. All fittings for 2" diameter and larger raceways shall be factory fittings.
- C. PVC conduit may be used under building slab on grade for branch feeder and branch circuits. Conduits under wash bay floor, garage floor and paved areas shall be concrete encased. Locate 24" below floor surface. Conduit shall be installed in drainage fill.
- D. PVC conduit may be used for exterior branch circuits.

3.4 FLEXIBLE CONDUIT

- A. Flexible Metallic Conduit shall be used for connection to motors, air handlers, lay in light fixtures, and pumps. In damp locations flexible conduit shall be water tight and equal to "sealtite." All flexible conduit shall be at least $\frac{1}{2}$ " diameter and not more than 6'-0" long.

3.5 FITTINGS

- A. All raceways, where they enter boxes, shall be secured in place with double locknuts and bushings. All bushings on conduits one and one-half inch ($1\frac{1}{2}$ ") diameter and larger shall be insulating bushings.
- B. Insulation and/or grounding type bushings shall be installed on all conduits where required by NEC or specifically noted.
- C. All conduits, where crossing building expansion joints or greater than 200 feet in length, shall be provided with properly bonded expansion fittings, similar to O.Z. Mfg. Co. Type AX, weatherproof.
- D. One-hole, steel straps shall be used to fasten raceways on flat surfaces; two-hole straps shall be used for uneven surfaces or where raceways are mounted to auxiliary steel.
- E. Provide plastic bushings at the end of conduits to protect cables from damage.

3.6 SLEEVES, INSERTS, AND OPENINGS

- A. The Electrical Contractor shall layout his work prior to construction of new walls and floors. He shall provide and install sleeves and inserts for all conduits, pipes, or ducts which pass through concrete walls or floors. Sleeves shall be constructed of galvanized steel and shall be rigidly installed into walls and floors. Finally, provide all necessary inserts to support electrical equipment in accordance with the manufacturer's recommendations and any governing code.

3.7 CUTTING AND PATCHING

- A. This Contractor shall work in advance of other Contractors when possible so that cutting and patching is not required. When cutting and patching is necessary to correct improperly installed materials, it shall be done at this Contractors expense. Finally, no structural members shall be cut without the expressed written consent of the Architect.

3.8 BOXES

- A. This contractor shall provide and install all necessary boxes required to complete the electrical installation. Any open knock outs not used shall be plugged with suitable blanking devices. All boxes shall be rigidly fastened to the building structure.
- B. Provide and install new receptacle and switch boxes and any special purposes boxes as called for on the drawings. New boxes shall include plaster rings as required.
- C. Wall switch boxes shall be mounted 4'-0" above floor level. Receptacle boxes shall be mounted 16" above floor level unless noted otherwise. All dimensions are to bottom of box.
- D. All outlet boxes upon which lighting fixtures are to be installed shall be equipped with 3/8" inch fixture studs and shall be steel boxes.
- E. All boxes shall be rigidly supported from building structure independent of the conduit system.
- F. Install pull box cabinets as required by the NEC and/or where shown on plans.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Metal Duct Wireways.

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall comply with NEC requirements.
- B. Underwriter's Laboratory
 - 1) All material shall bear UL labels.

2. PART 2 – PRODUCTS

2.1 METAL DUCT WIREWAY

- A. 16 gauge galvanized construction with ANSI-49 epoxy gray paint.
- B. 2 ½" x 2 ½" and larger to have hinged top.
- C. NEMA 3R raintight rating in exterior applications.
- D. NEMA 1 general purpose rating on interior of building.
- E. Sufficient size to accommodate all cables and wires installed.
- F. Wireways or wire duct shall be of sufficient size to accommodate all cables, and wires installed and/or as noted on plans for use in unfinished areas for feeders, etc., where specifically noted and in accordance with NEC Article 362.
- G. All wireways shall be complete with proper fittings, etc., to form a closed wireway system including end caps, covers, tees, ells, etc.
- H. Wireways shall be Square D Co. "Square-duct" or equal as made by Keystone or Hoffman and shall be complete with full length hinged screw type cover.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Bond each length together with No. 12 green grounding conductor.
- B. Type and sizes shall be as required by the application.

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3.2 METAL DUCT WIREWAY

- A. Provide wireways in mechanical rooms and other rooms, as shown on plans or required to complete project. Install in accordance with manufacturer's recommendations.

◆ END OF SECTION ◆

1. PART 1 GENERAL

1.1 DESCRIPTION

- A. Identify each piece of electrical equipment, such as switchboard, automatic transfer switch, disconnects, starters, power and lighting panels, and auxiliary systems, on the front cover or trim with its designated name or number/letter shown on the Drawings and with the voltage available within the panel and the source from where it is fed. Identify panelboards in finished areas on the inside cover.
- B. Install laminated plastic nameplates for equipment. Identification shall be as indicated on the following examples:

PANEL A

120/240 volt, 1-phase, 3-wire
From MDP

1.2 ACCEPTABLE MANUFACTURERS

- A. Seton “Setmark” or approved equal by Brady, MSI, or Calpico.

2. PART 2 PRODUCTS

2.1 EQUIPMENT IDENTIFICATION

- A. Laminated plastic nameplates, sized for minimum 1/4 in. high white letters or numbers engraved into a black background, Gothic style.
- B. “Dymo” or similar tape type labels shall **NOT** be used.
- C. Type written panelboard schedules shall be included and installed inside panelboard covers.
- D. Identify the covers of each junction and pull box with self-adhesive vinyl labels indicating the circuit numbers which are concealed within.
- E. Provide labels for electrical conduits after painting is complete.

◆ END OF SECTION ◆

INSTRUMENTATION AND CONTROL FOR ELECTRICAL SYSTEMS

1. PART 1 GENERAL

1.1 SCOPE

- A. Provide all power, control, and interlock wiring and conduit, relays, control power transformers, auxiliary contacts, and fuses as required to provide complete and operating control systems and effect the proper sequence of operation of each equipment subsystem.
- B. Unless otherwise noted, provide all line voltage and low voltage wiring and conduit.

1.2 DESCRIPTION OF CONTROL WIRING REQUIREMENTS

- A. Split-System Air Conditioning Condensing Units: Provide weatherproof fused disconnect switch, fuses, power, and control wiring.
- B. Motor-Operated Dampers: Provide power and interlock wiring. Refer to specific units.
- C. Exhaust Fans: Wire to magnetic starter, wall switch, wall switch with pilot light, reverse-acting thermostat located at the exhaust fan as indicated on the Drawings. Interlock with gas sensors as required.
- D. Furnaces: Provide manual motor starter switch, power, and control wiring.
- E. Thermostats: Unless noted otherwise, provide rough-in boxes, control wiring, and conduit.

◆ END OF SECTION ◆

1. PART 1 – GENERAL

1.1 WORK INCLUDED

- A. Contractor's work to include all labor, materials, tools, appliances, control hardware, lighting controls, sensors, wire, junction boxes and equipment necessary for and incidental to the delivery, installation and furnishing of a completely operational occupancy sensor lighting control system, as described herein.
- B. Contractor/Supplier shall examine all general specification provisions and drawings for related electrical work required as work under Division 26.
- C. Contractor shall coordinate all work described in this section with all other applicable plans and specifications, including but not limited to wiring, conduit, fixtures, HVAC systems and building management systems.

1.2 EQUIPMENT QUALIFICATION

- A. Products supplied shall be from a single manufacturer that has been continuously involved in manufacturing of occupancy sensors for a minimum of five (5) years. Mixing of manufacturers shall not be allowed.
- B. All components shall be U.L. listed, offer a five (5) year warranty and meet all state and local applicable code requirements.
- C. Products shall be manufactured by an ISO 9002 certified manufacturing facility and shall have a defect rate of less than 1/3 of 1%.
- D. Wall switch products must be capable of withstanding the effects of inrush current. Submittals shall clearly indicate the method used.

1.3 SYSTEM DESCRIPTION

- A. Occupancy Sensors
 - 1) The objective of this section is to ensure the proper installation of the occupancy sensor-based lighting control system so that lighting is turned off automatically after reasonable time delay when a room or area is vacated by the last person to occupy said room or area.
 - 2) The occupancy sensor-based lighting control shall accommodate all conditions of space utilization and all irregular work hours and habits.
 - 3) Contractor shall warrant all equipment furnished in accordance to this specification to be undamaged, free of defects in materials and workmanship, and in conformance with specifications. The supplier's obligation shall include repair or replacement, and testing without charge

to the owner, all or any parts of equipment which are found to be damaged, defective or non-conforming and returned to the supplier. The warranty shall commence upon the owner's acceptance of the project. Warranty on labor shall be for a minimum period of one (1) year.

B. Exterior Lighting controller

- 1) The product specified under this portion shall ensure the exterior lights automatically turn on and off, at a preset time, determined by the owner, adjusting for daylight savings time.
- 2) A master override switch, interlocked with the exterior lighting controller, shall be available to the owner in an accessible and clearly labeled location for bypass control.

1.4 SUBMITTALS

- A. Manufacturer shall substantiate conformance to this specification by supplying the necessary documents, performance data and wiring diagrams. Any deviations to this specification must be clearly stated by letter and submitted.
- B. Submit a lighting plan clearly marked by manufacturer showing all lighting system components, in addition to location and orientation of each sensor.
- C. Submit any interconnection diagrams per major subsystem showing proper wiring.
- D. Submit standard catalog literature which includes performance specifications indicating compliance to the specification.
- E. Catalog sheets must clearly state any load restrictions when used with electronic ballasts.

1.5 SYSTEM OPERATION

- A. It shall be the contractor's responsibility to make all proper adjustments to assure owner's satisfaction with the occupancy system, and lighting controls.

1.6 QUALITY ASSURANCE

- A. Underwriter's Laboratory
- B. NFPA 70 – National Electric Code

2. PART 2 – EQUIPMENT

2.1 ACCEPTABLE MANUFACTURERS

- A. The Watt Stopper, Leviton, Lithonia, Current Lighting, Hubbell, Pass & Seymour, TORK, Douglas Controls and PCI Lighting Control Systems.

- B. The listing of any manufacturer as "acceptable" does not imply automatic approval. It is the sole responsibility of the electrical contractor to ensure that any price quotations received, and submittals made, are for sensors and controls which meet or exceed the specifications included herein.

2.2 OCCUPANCY SENSORS

- A. Wall-Mounted, UL-Listed, Self-Contained, with (1) ultrasonic transmitter, (1) ultrasonic receiving transducer, sensitivity adjustment, adjustable 30 second to minute time-delay OFF, power pack relay, 120 volt, and full 5 year warranty.
 - 1) Wall switch sensors shall be capable of detection of occupancy at desktop level up to 300 square feet, and gross motion up to 1000 square feet.
 - 2) Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts and shall have 180° coverage capability
- B. Dual-Technology Type: Ceiling mounting; detect occupancy by using a combination of PIR and ultrasonic detection methods in area of coverage. Particular technology or combination of technologies that controls on-off functions shall be selectable in the field by operating controls on unit. Unit shall be UL-listed, self-contained, with (1) ultrasonic transmitter, (1) ultrasonic receiving transducer, sensitivity adjustment, adjustable 30 second to 30 minute time-delay OFF, power pack relay, 120 volt, and full 5 year warranty.
- C. All sensors shall have readily accessible, user adjustable setting for time delay and sensitivity. Settings shall be located on the sensor (not the control unit) and shall be recessed to limit tampering.
- D. In the event of failure, a bypass module override shall be provided on each sensor. When bypass is utilized, lighting shall remain on constantly or control shall divert to a wall switch until sensor is replaced. This control shall be recessed to prevent tampering.
- E. All sensors shall provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.
- F. It is the contractor's responsibility to coordinate compatibility of fixtures and controls, provide power packs, and any additional devices as required for a complete and operational system.

2.3 EXTERIOR LIGHTING CONTROLLER

- A. Timeclock Controller
 - 1) Provide 2 channel digital lighting controller equal to TORK Model DGLC 200A. Clock input shall be 120 volt, SPDT 20A. Include lithium battery for battery backup power source. System shall permit 7-day scheduling and special day scheduling. Controller shall be located in electrical room.

B. System Operation

- 1) System shall be wired and programmed so that the exterior lights turn on at dusk and turn off at a preset time. Provide a master override switch, clearly labeled. Coordinate the exact location of override switch with owner prior to rough-in.

3. PART 3. EXECUTION

3.1 INSTALLATION OF OCCUPANCY SENSORS AND ACCESSORIES

- A. It shall be the contractor's responsibility to locate and aim sensors in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have ninety (90) to one hundred (100) percent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.
- B. The successful bidder shall install and connect the networked lighting control system components according to the manufacturer's installation instructions, wiring diagrams, the project submittals and plans specifications.
- C. It is the contractor's responsibility to arrange a pre-installation meeting with manufacturer's factory authorized representative, at owner's facility, to verify placement of sensors and installation criteria.
- D. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components.

3.2 TRAINING

- A. Providing training to Owner personnel in the operation and programming of the lighting control system. The contractor shall provide, at the owner's facility, the training necessary to familiarize the owner's personnel with the operation, use, adjustment, and problem-solving diagnosis of lighting control systems.

3.3 WARRANTY

- A. Manufacturer shall provide a five (5) year warranty for all system components.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Distribution Panelboard
- B. Panelboards

1.2 QUALITY ASSURANCE

- A. Distribution Panelboards UL50 and NEMA PB1.
- B. Panelboards UL 67 and NEMA PB-1
- C. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with NEC requirements
- D. Underwriter's Laboratory
 - 2) All equipment shall be UL listed or bear a UL label.

2. PART 2 – PRODUCTS

2.1 PANELBOARDS/DISTRIBUTION PANELBOARDS

- A. The Electrical contractor shall install new panelboards as called for in this specification and on the drawings. This contractor shall supply all necessary items to complete the installation of these new panelboards.
- B. Each panelboard and panelboard switch shall include a plastic identification tag.
- C. Cabinets shall be constructed of commercial, galvanized, code gauge sheet steel. Gutters shall be sized to conform to avoid overcrowding.
- D. Trims shall be oversized where necessary to accommodate the entrance of several large conduits and/or when necessary to avoid overcrowding.
- E. Trims shall be surface or flush type as indicated on drawings. Trims shall contain piano hinged doors and be equipped with flush chrome plated combination locks and catches, all keys alike. Deliver two (2) keys to the Owner for each panel installed.
- F. Dead front, steel cabinet, baked enamel finish, concealed hinges, flush lock, typed circuit directory, copper bussing, separate ground and neutral bars, lugs and adapters suitable for feeder sizes (CU/AL), bolt on thermal magnetic circuit breakers, tripped circuit indicator, 20 amp switching breaker rating, lock-on straps as required.

- G. Minimum interrupting capacity shall be 10,000 amps RMS.
- H. Furnish integral transient voltage surge suppressor with status indicator lights and a rated-for-minimum-peak surge current of 80,000 amps per mode.
- I. Furnish bolt-on breakers. For all air conditioning, compressors, and similar motor loads, furnish type HACR breakers.
- J. MINIMUM REQUIREMENTS
 - 1) Tin plated copper or aluminum phase and neutral bussing.
 - 2) Integral ground buss.
 - 3) Panelboards to be provided with overcurrent protective devices, enclosure suitable for use and compression type main and neutral lugs.
 - 4) Typed panelboard directory of circuits.
 - 5) Lamicoid label for branch circuits.
 - 6) Panelboards to be provided with circuit breaker type over current protective device with short circuit current available at terminals.
 - 7) Mechanical type main and neutral lugs.
 - 8) Cabinets for panelboards and distribution panels shall have NEMA 1 enclosures with sufficient gutter space to meet NEC Tables 373.6(a) and (b) requirements.
 - 9) Bus bars in panelboard and distribution panel assemblies shall be adequately braced to withstand the maximum short circuit current at the point of application.
 - 10) Equipment meeting all requirements of the specifications by General Electric, Siemens or Square D Company are approved.

2.2 DISTRIBUTION PANELS

- A. Main Distribution Panel MDP
 - 1) Provide and install new 120/240 volt – 1 PH – 3 wire main distribution panel. Panels shall include 200 Amp – 2 pole main circuit breaker and be rated for a fault current of 22,000 amperes.

2.3 BRANCH CIRCUIT PANEL BOARDS

- A. LIGHTING AND POWER PANELS - 120/240V - 1 PH - 3 wire
 - 1) See drawings for ratings and configuration.

- 2) New power panel shall be Square D type NQOD or equal by General Electric or Siemens.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. Install panelboards in accordance with manufacturer's recommendations and NEC requirements.
- B. Panelboards shall be securely bolted to masonry walls.
- C. Provide arc flash hazard label on equipment per the National Electrical Code.
- D. Protect switchgear and panelboards from damage by other contractors, including painting work. Paint overspray or other materials shall be removed from equipment prior to final acceptance.

◆ END OF SECTION ◆

1. PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Duplex Receptacles and Integral GFCI Receptacles
- B. Wall Switches
- C. Wall Switch Occupancy Sensors
- D. Dimmer Switches
- E. Device Cover Plates

1.2 DESCRIPTION

- A. Provide wiring devices as indicated, including cover plates. Wiring devices shall be NEMA type approved for the environmental conditions prevailing.
- B. Equipment Termination: Prior to rough-in, verify termination requirements, including, but not limited to, plug-receptacle configuration.
- C. All receptacles on emergency power shall be red, all other receptacles shall be white.

1.3 QUALITY ASSURANCE

- A. Duplex Receptacles and Integral GFCI Receptacles - Underwriter's Laboratory 498, NEMA WD 1.
 - 1) All receptacles shall be UL listed.
- B. Wall Switches - Underwriter's Laboratory 20, NEMA WD 1.
 - 1) All wall switches shall be UL listed.
- C. Wall Switch Occupancy Sensors
 - 1) Shall be UL listed.
- D. Dimmer Switches – NEMA WD1
- E. Device Cover Plates - Underwriter's Laboratory 514
 - 1) All device cover plates shall bear a UL label or be UL listed.
- F. NFPA 70 - National Electrical Code.

- 1) All work shall be in accordance with the National Electrical Codes.

2. PART 2 PRODUCTS

2.1 SWITCHES

- A. Wall switches shall be 20 amp, 120/277 volt, Construction/Heavy-Duty Specification Grade, back wired and side wired.
- B. Switches shall be made by Leviton, Hubbell or Pass & Seymour.
- C. Switches shall be:
 - 1) Single Pole Hubbell 1221 Pass & Seymour 20 AC1
 - 2) Three Way Hubbell 1223 Pass & Seymour 20-AC-3
 - 3) Four Way Hubbell 1224 Pass & Seymour 20-AC4

2.2 RECEPTACLES

- A. Receptacles shall be 125 volt, Construction/Heavy-Duty Specification, 2 pole, 3 wire grounding, back-wired and side- wired.
- B. Ground fault protection where required shall be built into receptacle.
- C. Ground fault protection where required shall be built into receptacle. Tripping values shall conform: UL 1436 and UL 943.
- D. Receptacles shall be as made by Hubbell, Pass & Seymour, or Leviton.
- E. Receptacles shall be:
 - 1) Duplex convenience receptacle Hubbell 5362 Pass + Seyman 5362
 - 2) GFI receptacle Hubbell GF 20xlu Pass + Seyman 2095x
 - 3) Duplex surge suppression Hubbell HBL5362x SA Pass + Seyman TR5362x SP
 - 4) USB Hubbell USB 20AC5WWR
 - 5) Tamper Resistant Hubbell 5362x TR Pass + Seyman TR55362

2.3 WALL SWITCH OCCUPANCY SENSORS

- A. Provide passive infrared occupancy sensor switches with adaptive technology and adjustable time delay. Device shall include "on" – "off" occupant switch. Sensor shall have 180° degree field of view.
- B. Wall box occupancy sensors for fluorescent lights shall be rated for 1000 watts at 120 volts and be equal to Hubbell AD 2000x1 Watt Stopper DW100 or Pass &

Seymour WDT100 or equal by Sensor Switch. Provide stainless steel cover plate.

2.4 WALL DIMMERS

- A. Wall box dinners for LED lights shall be 0-10 volt dimming. Verify compatibility with LED fixtures.
- B. LED dimmer switches shall be equal to Greengate WBSD-010SLD; Lutron NTSTV-DV; Sensor Switch WSX PDT DX; or Crestron GLA-DTWLS-DIM. Color dimmer face plates will be selected from manufacturer's standard colors.

2.5 PLATES

- A. Plates for flush devices in interior partitions shall be Specification Grade stainless steel Type 302/304.
- B. Plates for flush devices in concrete block walls shall be Specification Grade stainless steel Type 302/304 "Jumbo" plates.
- C. Plates for devices in surface fittings shall be cadmium-plated steel surface covers. Covers shall fit without overlap and have round corners.
- D. Plates for heavy-duty outlets and for specialty switches and outlets required for auxiliary systems shall be stainless steel.
- E. All metal plates shall be grounded.
- F. All cover plates for devices connected to the generator shall be red in color.

3. PART 3 – EXECUTION

3.1 GENERAL

- A. This contractor shall provide all switches and receptacles as shown on the drawings.
- B. Location of receptacles on drawings are diagrammatical, the electrical contractor shall adjust the location as required to avoid interference with work by others.

3.2 CONVENIENCE RECEPTACLES

- A. Provide and install convenience receptacle as shown on drawings. Receptacles shall be mounted 16" above floor level or 6" above counter unless noted otherwise. All dimensions are from floor level to bottom of box.
- B. GFIC receptacles in restrooms shall be mounted 48" above floor level unless noted otherwise. All convenience receptacles shall comply with current ADA and ANSI handicapped accessibility standards.

3.3 COVER PLATES

- A. Provide stainless steel cover plates for local switches, receptacles, voice/data jacks, television receptacle boxes and other devices as required.

3.4 LOCAL SWITCHES

- A. Provide and install local switches as shown on the drawings. Switches shall be mounted 4'-0" above floor level to bottom of box.

3.5 WALL SWITCH OCCUPANCY SENSORS

- A. Provide and install wall switch occupancy sensors as shown on the drawings. Switches shall be mounted 4'-0" above floor level to bottom of box.

3.6 WALLBOX DIMMERS

- A. Furnish and install incandescent dimmers as shown on plans. Wire and install in accordance with manufacturer's recommendations. Dimmer switches shall be mounted 4'-0" above floor to bottom of box.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fuses
- B. Fuse Holders

1.2 QUALITY ASSURANCE

- A. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with NEC requirements.
- B. Underwriter's Laboratory
 - 1) All fuses shall be UL listed or bear UL label.
- C. Cartridge Fuses: NEMA FU 1, ANSI/IEEE FU 1.

2. PART 2 - PRODUCTS

2.1 FUSES

- A. Low voltage fuses shall be Class R or Class L rejection type, time delay, high interrupting, current limiting, dual element.
- B. Fuses rated 0 through 600 amp for Motor Branch Circuit shall be NEMA Class "RK1" and U.L. approved for 200,000 amps RMS symmetrical interrupting capacity.
 - 1) Fuses for other branch circuits Class J time delay.
 - 2) Fuses shall be by Eaton, Mersen, equal to Bussmann Type LPNR
- C. Fuses shall be nonrenewable cartridge type, noninterchangeable type.
- D. Low voltage fuses shall be made by Littelfuse, Eaton, Bussman or approved equal.
- E. Spare Fuse Cabinet: Wall-mounted 18 gauge steel unit.
 - 1) Provide space fuse cabinet located in main switchgear room for storage of spare fuses.
- F. At the completion of the project, the electrical contractor shall supply the Owner with 3 spare fuses for each type and size installed.

3. PART 3 - EXECUTION

3.1 GENERAL

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- A. Furnish and install all new fuses shown on the drawings, specified, or required to complete the intended installation.
- B. Verify proper size of fuses with equipment provider prior to installation.

◆ END OF SECTION ◆

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Safety Switches
- B. Circuit Breakers

1.2 QUALITY ASSURANCE

- A. Safety Switches: UL 98, NEMA KS1.
- B. Molded Case Circuit Breakers: UL 489, NEMA AB1.
 - 1) Circuit breakers shall be UL listed for the panel they are installing.
- C. NFPA 70 – National Electrical Code
 - 1) All work shall comply with NEC requirements.
- D. Underwriter's Laboratory
 - 1) Safety switches shall be UL listed.

2. PART 2 - PRODUCTS

2.1 SAFETY SWITCHES

- A. NEMA Heavy-duty Type HD, steel enclosure, dual-cover interlocks, HP rated plated contacts, indicating handle and provisions for padlocking. Switches shall be NEMA Type approved for the environmental conditions prevailing. Provide Class R rejection fuse clips. Toggle operated disconnect switches equal to Square D Class 2510 shall be acceptable for unfused loads less than 16 amps.
- B. Rating suitable for use.
 - 1) Switch rating size shall be as noted on plans.
- C. Totally enclosed with external operating handle and mechanical cover interlock.
 - 1) Switches shall be in NEMA 1 enclosure, unless noted otherwise.
 - 2) Provide NEMA 4 stainless steel enclosures when noted on plans.
- D. Padlockable handle in the OFF position.
- E. Fusible type switches.

- 1) Provide properly sized fuses.
- F. Non fusible type
 - 1) Non-fused type shall be equipped with solid copper links.
- G. Integral ground lug
 - 1) Provide integral ground lug
- H. NEMA 3R in weatherproof locations.
 - 1) All exterior safety switches shall have NEMA 3R enclosure unless noted otherwise.
- I. Heavy duty type
 - 1) Safety switches shall be heavy duty type.
- J. Acceptable Manufacturers
 - 1) Square D Company
 - 2) General Electric
 - 3) Siemens

2.2 PANELBOARD BREAKERS

- A. Cases for circuit breakers and switches shall be constructed of a glass-reinforced insulating material that provides high dielectric strength. Current carrying components shall be isolated from the handle. The handle position shall indicate whether the circuit breaker is OFF, ON or tripped.
- B. Circuit breakers shall
 - 1) Have common tripping of all poles
 - 2) Have trip indicator
 - 3) Be rated 10,000 ampere interrupt minimum and shall be bolt-on type
- C. Ground Fault Protection
 - 1) Provide ground fault protection for branch circuits as noted on plans.
 - 2) Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (5-mA trip).

- 3) Ground-Fault, Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).
 - 4) Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered or remote-mounted and powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
- D. HACR Type
- 1) Provide HACR type circuit breakers for all heating, air conditioning and refrigeration loads requiring HACR breakers.
- E. Shunt Trip
- 1) Provide shunt trip circuit breakers as noted on plans.
 - 2) When energized by a pushbutton or other pilot device, the shunt trip shall cause the circuit breaker to trip. The trip coil shall have a coil clearing contact to open the coil circuit when the circuit breaker trips.
- F. Provide circuit breaker pins or clips as required for single pole breakers sharing a common neutral to comply with NEC article 210.4 requirements.
- G. Features and Accessories:
- 1) Lugs: Compression type, suitable for number, size, trip ratings, and conductor material.
 - 2) Undervoltage Trip: Set to operate at 35 to 75 percent of rated voltage without intentional time delay.

3. PART 3 - EXECUTION

3.1 SAFETY SWITCHES

- A. Install safety switches in accordance with manufacturers' instructions and NEC requirements.
- B. Provide any mounting hardware required to properly restrain safety switch to building structure or equipment.

3.2 CIRCUIT BREAKERS

- A. Provide all circuit breakers shown on the drawings or specified.
- B. Install circuit breakers in panelboards in accordance with manufacturer's instruction.

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- C. Circuit breakers shall be manufactured by the same company as the panelboard or switchgear in which they are being installed.
- D. Series rated circuit breaker not acceptable.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Manual Motor Starters

1.2 DESCRIPTION

- A. Provide starters, contactors, control stations, and feeder and branch circuits to motors and equipment.
- B. Coordinate rough-in with equipment supplied. Wiring diagrams shall be furnished with the equipment supplied.
- C. Provide thermal overload protection for all motors. No thermal protection shall exceed 115% of motor nameplate amperes. Overloads shall be sized in accordance with motor nameplate rating and service factor.
- D. Furnish minimum NEMA Size 0 starter. Furnish magnetic starter for each motor that is automatically controlled or interlocked with another motor or device.
- E. Provide motor short-circuit protection as required.

2. PART 2 - PRODUCTS

2.1 ACROSS-THE-LINE MANUAL CONTROLLERS

- A. Manual motor starters (1/2 HP and smaller): Shall include toggle lever, neon pilot lights, stainless steel cover and nameplate, and thermal overload relays in all legs. Shall be open construction for flush-mounting in switchbox. Cover plate shall match device plates.
- B. Controllers shall be class A type and equipped with heaters and sensors in each phase matched to name plate full-load current of motor.
- C. All manual controllers for motors ½ HP and less shall be complete with overload and neon pilot light and shall be furnished and installed by this contractor. Starters shall be designed for 120 volts, single phase service. Starters shall be Allen Bradley 600 or 609; Square D class 2510, General Electric Type CR101, Siemens SMF. All manual starters shall be flush mounted in finished areas. Provide key switches where noted on plans.

2.2 MOTOR CONTACTORS

- A. For single-phase motors 1 HP and smaller, where required for interlocking or automatic control: Functional Devices, Inc., Model RIBT2401B. UL Listed 20 Amp. 120V coil, SPDT enclosed power relay contact, plenum-rated NEMA 1 housing,

high/low voltage compartments, LED pilot light, and 16 in. long line voltage wiring pigtails, or equal by Schnider Electric, Siemens, or Eaton.

3. PART 3 - EXECUTION

3.1 GENERAL

- A. The electrical contractor shall connect power to all motors supplied by the Mechanical Contractor.

3.2 MOTOR STARTERS

- A. Certain equipment provided by others will contain built-in starters. This Contractor shall provide power to control panel on this equipment. Sizing of overloads for built-in equipment will be by others.
- B. Finally, proper sizing of overload heaters shall be the responsibility of this contractor. At the completion of the project this contractor shall submit a report to the Architect containing all name plate motor information along with overload sizes.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Requirements a generator transfer panel.

1.2 QUALITY ASSURANCE

- A. NFPA 70 – National Electric Code
- B. NFPA 110 – Emergency and Standby Power Systems Level 1
- C. NEMA ICS 1

2. PRODUCTS 2 – PRODUCTS

2.1 GENERATOR INLET RECEPTACLE

- A. New inlet box shall match the owners existing connection cord: Crouse Hinds, Arktite Series Plug & Receptacle, 100a, 3poles, 4 wire, #APJ 10487 S22. It shall be NEMA 3R, corrosion resistant metallic box or non-metallic box.
- B. Inlet receptacle shall be tested and labeled by the Underwriters Laboratories.

2.2 GENERATOR TRANSFER SWITCH PANEL

- A. Provide a manual transfer switch: Qty. (1) for emergency power rated at 50 amperes, 3 pole, 3 wire 120/240 volt – 60Hz mounted in a NEMA 1 enclosure. Include five-year comprehensive warranty.
- B. Panel to have a capacity of (10) 20A branch circuit breakers minimum.
- C. Transfer switch panel shall be tested and labeled by the Underwriters Laboratories.

3. PART 3 – EXECUTION

3.1 INSTALLATION

- A. Install manual transfer switch in accordance with manufacturer's recommendations.

◆ END OF SECTION ◆

TRANSIENT VOLTAGE SUPPRESSION FOR LOW-VOLTAGE ELECTRICAL POWER CIRCUITS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

A. DESCRIPTION

- 1) This section describes the materials and installation requirements for surge protective devices (SPD) for the protection of all AC electrical circuits from the effects of lightning induced currents, substation switching transients and internally generated transients resulting from inductive and/or capacitive load switching.

1.2 QUALITY ASSURANCE

A. NFPA 70 – National Electrical Code. Including article 285, NEC 2002.

- 1) All work shall be accordance with NEC requirements.

B. Underwriter's Laboratory

- 1) Equipment shall be UL listed or bear UL label.

C. Transient Voltage Surge Suppressors: UL 1449 2nd Edition and UL 1283, ANSI/IEEE C62.41 Category A,B,C, and C62.45 testing.

D. NEMA LS-1

1.3 REFERENCES

- A. ANSI/IEEE C62.41 - IEEE Guide for Surge Voltages in Low Voltage AC Power Circuits
- B. ANSI/IEEE C62.45 - IEEE Guide for Surge Suppressor Testing
- C. FIPS Pub 94 (1983) - Guide on Electrical Power for ADP Installation
- D. National Electric code - Article 280-1, 2, 4, 12, 21, 25
- E. National Fire Protection Association - NFPA-20, NFPA-70, NFPA-75, NFPA-78
- F. NEMA LS-1 - Low Voltage Surge Protective Devices
- G. UL 1283 - Electromagnetic Interference Filters
- H. UL 1449 - transient voltage Surge Suppressors

1.4 RELATED WORK SPECIFIED ELSEWHERE

- A. General electrical provisions
- B. Raceways, boxes, and fittings
- C. Wire and cable
- D. Grounding

1.5 SUBMITTALS

- A. Shop drawings, product data and manufacturer's installation instructions for non-approved manufacturers shall be submitted for review ten days prior to the bid date. Approved manufacturer's shall provide the same required documentation at the drawing approval stage.
- B. The submittals shall include:
 - 1) Dimensional drawing of each suppressor type indicating the following:
 - a) Service Entrance SPD
 - [1] Copper bus bars (electrical grade copper 1.5" wide, 0.25" thick).
 - [2] Redundant replaceable surge current diversion modules on each phase
 - [3] Replaceable 200,000 AIC fuses for each module
 - [4] Diagnostic monitoring package
 - [5] Line to neutral, and neutral to ground suppression paths
 - 2) UL Standard 1449 Listing, Standard for Safety, Transient Voltage Surge Suppressors, documentation
 - 3) UL Standard 1283 Listing, Electromagnetic Interference Filters, documentation
 - 4) Spectrum analysis of SPD based on MIL-STD-220A test procedures between 50 kHz and 200 kHz.
 - 5) Independent third part test results verifying maximum surge current capability (single pulse rated).
 - 6) A document of specification compliance shall be included outlining the prospective manufacturers compliance or deviation from each point in the specification. Should deviations be noted, a comprehensive clarification shall be provided outlining the reason for deviation.

2. PART 2 - PRODUCTS

2.1 SERVICE ENTRANCE LOCATION

A. Transient Voltage Surge Protection Device

- 1) SPD shall be UL Listed to UL 1449, Standard for Safety, Transient Voltage Surge Suppressors, UL 1283, Electromagnetic Interference Filters.
- 2) SPD shall be modular in design. Each suppression element shall be a user replaceable surge current diversion module. (MOV based) Each surge current diversion module shall be fused with user replaceable 200 kAIC rated fuses. Each surge current diversion module shall include solid state status indicator lights. A 1% variation in metal oxide varistors is permitted.
- 3) SPD shall provide redundant surge current diversion modules between each phase conductor and the neutral conductor, and between the neutral conductor and ground. For delta configured systems, the SPD shall have components directly connected between each phase conductor and between each phase conductor and ground. Each mode of protection shall utilize two current sharing surge current diversion modules in parallel for either a wye or delta configuration.
- 4) SPD shall incorporate copper bus bars for the surge current path. Small gauge round wiring or plug-in connections shall not be used in the path for surge current diversion. Surge current diversion modules shall not be used in the path for surge current diversion. Surge current diversion modules shall use bolted connections to the bus bars for reliable low impedance connections.
- 5) SPD shall meet or exceed the following criteria:
 - a) Maximum surge current capability (single pulse rated) shall be 120 kA per phase, in accordance with NEMA LS 1 Standard.
 - b) Endurance Testing: capable of protecting against and surviving 4000 ANSI/IEEE C62.41 Category C3 transients without failure or degradation of UL 1449 Suppression voltage Rating by more than 10%.
 - c) UL 1449 Suppression Voltage Ratings shall not exceed the following

[1]	Voltage	120/240
[2]	L-N	400V
[3]	L-G	400V
[4]	N-G	400V

With Internal disconnect Switch.
- 6) SPD shall be designed to withstand a maximum continuous operating voltage (MCOV) of not less than 115% of nominal RMS voltage.
- 7) SPD shall have a minimum EMI/RFI filtering of -50dB at 100kHz with an insertion ratio of 50:1 using MIL STD. 220A methodology, in accordance

with NEMA LS 1 Standard.

- 8) SPD shall be equipped with onboard visual and audible diagnostic monitoring. Red and green indicator lights shall provide full time visual diagnostic monitoring of the operational status of each phase as well as each surge current diversion module. Audible diagnostic monitoring shall be by way of audible alarm. This alarm shall activate upon a fault condition. An alarm on/off switch shall be provided to silence the alarm. An alarm push to test switch shall be provided. The SPD diagnostic monitoring devices shall be mounted on the front of the SPD enclosure. The diagnostic monitoring circuits shall continually monitor the operational status of the surge current diversion modules. No other test equipment shall be required for SPD monitoring or testing before or after installation.
- 9) SPD shall have a response time no greater than one nanosecond for any of the individual protection modes.
- 10) SPD shall have a warranty for a period of five year, incorporating unlimited replacements of suppressor parts if they are destroyed by transients during the warranty period.
- 11) SPD shall be equipped with the following items
 - a) A transient event surge counter
 - b) An internal UL Listed disconnect
 - c) Form C dry contacts for remote annunciation

3. PART 3 - EXECUTION

3.1 SERVICE ENTRANCE

- A. Install one SPD at the switchboard at each utility service entrance to the facility, according to manufacturer's recommendations.
- B. The TVSS shall be installed on the load side of the service entrance.
- C. The TVSS ground shall be bonded to the service entrance ground.
- D. Provide built-in installation.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 DESCRIPTION

- A. Provide LED lighting fixtures complete with drivers, frames, canopies, hangers, straps, and trim, as required for a complete installation.
- B. Coordinate fixture mounting type with ceiling type listed on the Architectural Room Finish Schedule.

1.2 QUALITY ASSURANCE

- A. Underwriter's Laboratory
 - 1) All fixtures shall be UL listed or bear UL label.
- B. NFPA 70 - National Electrical Code
 - 1) All work shall be in accordance with NEC requirements.
- C. Fluorescent fixtures UL 1598.
- D. Solid State Lighting (LED) UL 1598.
- E. Emergency Lighting UL 924.
- F. Exit Signs UL 924.

2. PART 2 - PRODUCTS

2.1 SOLID STATE LIGHTING (LED) LUMINAIRES

- A. Types
 - 1) Recessed or surface mounted.
 - 2) Comply with IES LM-79
 - 3) CRI 70 minimum, color corrected temperature of 4100k.
 - 4) Color consistency NEMA SSL3
 - 5) B50 rating at least 50,000 hours per IES LM-80
 - 6) Fixtures shall have internal drivers unless specifically permitted/required by the fixture selection or installation.

2.2 EXIT SIGNS

A. Furnish and install the exit signs as shown on plans.

1) Combination LED Exit Signs/Energy Lights

a) The new exit signs shall be equal to Lithonia Model LHQMLED/ELA LEDWPM12, or equal by Chloride, Dual-Lite or SureLite. Signs shall be 6" red letter with white housing and face. Arrows number of faces and mounting shall be as shown on plans. Exit signs shall operate on 120 volts and include 90-minute battery

2.3 EMERGENCY LIGHTING

A. Integral

1) Provide and install integral emergency egress lighting as shown on drawings. Each fixture shall be complete with built-in battery, charger and automatic transfer relay to provide 90 minutes of emergency illumination during power failure. Unit shall operate on 120 volts

2.4 LIGHT FIXTURES SUPPORT COMPONENTS

A. ¼ inch minimum diameter thread steel rod hangers

B. ½ inch steel tubing with swivel ball fittings and ceiling canopy.

3. PART 3 - EXECUTION

3.1 INTERIOR BUILDING FIXTURES

A. Furnish and install the new lighting fixtures, lighting equipment and components as shown on the drawings, specified or required.

B. All fixtures and equipment shall be delivered to the project complete with suspension accessories, canopies, hickey, casings, sockets, holders, reflectors, ballasts, diffusing materials, louvers, plaster frames, recessing boxes, accessories, etc., all wired and assembled as indicated.

C. Fixtures shall be mounted directly from the building structure without relying on the ceiling suspension system.

D. Provide all necessary inserts, auxiliary steel, hanger, etc.

E. Provide swivel connections for sloped ceilings for any stem hung light fixtures.

3.2 LAMPS

A. Electrical contractor shall install only enough lamps to provide adequate lighting for completion of work by all trades.

B. The remaining lamps shall be installed within 10 days prior to final inspection.

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C. At the time of final inspection, all lamps shall be functioning properly.

◆ END OF SECTION ◆

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EXTERIOR LIGHTING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Exterior luminaires with lamps and ballast; and poles.

1.2 QUALITY ASSURANCE

- A. Underwriter's laboratory
 - 1. All fixtures shall be UL listed or bear UL label.
- B. NFPA 70 – National Electrical Code
 - 1. All work shall be in accordance with NEC requirements.
- C. Luminaires UL 1598.
- D. Solid State Lighting (LED) UL1598.

2. PART 2 – PRODUCTS

2.1 SOLID STATE LIGHTING (LED) LUMINAIRES

- A. Shall be listed and labeled for installation in wet location.
- B. Metal parts shall be free of burrs, sharp corners, and edges.
- C. Shall be constructed of corrosion-resistant aluminum.
- D. Shall be rigidly formed housings that provide weathertight and light tight enclosures.
- E. Shall have stainless steel exposed hardware.
- F. Doors and frames shall prevent accidental falling during relamping or ballast replacement.
- G. Shall have heat and aging-resistant resilient gasket to seal lenses to luminaire door.
- H. Shall comply with IES LM-79 and have a CRI of 75 minimum.
- I. Color Consistency shall comply with NEMA SSL3.
- J. Shall have a B50 rating of at least 50,000 hours per IES LM-80.

2.2 DRIVERS FOR SOLID STATE LIGHTING (LED) LUMINUAIRES

- A. Shall comply with ANSI 82.11 and be UL 935 approved.
- B. Shall have a 120 volt input rating and a 24 volt DC output rating.
- C. Shall have a power factor of .90 or higher.

3. PART 3 – EXECUTION

3.1 EXTERIOR BUILDING FIXTURES

- A. Exterior lights shall be carefully located, rigidly mounted and properly piped to avoid unsightly raceways or boxes.
- B. Furnish and install the new exterior lights as shown on the plans, including lamps, poles, brackets, timers, boxes, wiring, connections, conduit, etc. for a complete and operable installation.

3.2 EXTERIOR FIXTURE FOUNDATIONS

- A. This contractor shall furnish and install all bases, foundations, anchor bolts, reinforcing, supports, etc. as required for the new outdoor lighting fixtures.

◆ END OF SECTION ◆

GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Telecommunications Main Grounding Busbar (TMGB)
- B. Telecommunications Grounding Busbar (TGB)
- C. Telecommunications Bonding Backbone (TBB)

1.2 QUALITY ASSURANCE

- A. All equipment shall be UL listed
- B. All equipment and installation shall comply with the latest National Electric Code
- C. All equipment installation shall comply with the latest Local Electric Code
- D. All equipment installation shall comply with the latest ANSI/TIA/EIA 758 standard.
- E. All equipment and installation shall comply with the latest ANSI J-STD-607, and BISCII standards.

2. PART 2 - PRODUCTS

2.1 TELECOMMUNICATIONS MAIN GROUNDING BUSBAR (TMGB)

- A. Provide Telecommunications Main Ground Busbar (TMGB) in Main Cross connect (MDF/MCC) room.
- B. All TMGB Connections to be made with double-bolted, Compression style, Grounding Lugs.

2.2 TELECOMMUNICATIONS GROUND BUSBAR (TGB)

- A. Provide Telecommunications Ground Busbar (TGB) in all Telecommunications Rooms (TRs) and AV Equipment Cabinets.
- B. All TGB Connections to be made with double-bolted, Compression style, Grounding Lugs.

2.3 TELECOMMUNICATIONS BONDING BACKBONE (TBB)

- A. Provide Telecommunications Bonding Backbone (TBB) between all TGBs and the TMGB.
- B. All TBB Connections to be made with double-bolted, Compression style, Grounding Lugs.
- C. The TBB shall be a minimum of #6 AWG insulated copper bonding conductor.

2.4 GROUNDING AND BONDING CONDUCTORS

- A. All rounding and bonding conductors shall be copper and may be insulated. When conductors are insulated, they shall be listed for the application. Minimum bonding conductor shall be NO. 6 AWG

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. As a minimum, Bond TMGB to following:
 - 1) Building steel (minimum #6 AWG insulated copper bonding conductor). CAD Weld Bonding Conductors to Building Steel.
 - 2) Main Electrical Service Ground (minimum #6 AWG insulated copper bonding conductor).
 - 3) Local Service Panel Ground (minimum #6 AWG insulated copper bonding conductor).
 - 4) Telecommunications Bonding Backbone (TBB) that connects TMGB to other TBG's (minimum #6 AWG insulated copper bonding conductor).
 - 5) Associated Telecommunications Cable Tray(s) (minimum #6 AWG insulated copper bonding conductor).
 - 6) Telecommunications Conduit(s) Entering TR (minimum #6 AWG insulated copper bonding conductor).
- B. As a minimum, Bond TGB to following:
 - 1) Building Steel (minimum #6 AWG insulated copper bonding conductors).
 - 2) Local Service Panel Ground (minimum #6 AWG insulated copper bonding conductor).
 - 3) Telecommunications Bonding Backbone (TBB) that connects TBG to other TGBs and TMGB (minimum #6 AWG insulated copper bonding conductor).
 - 4) Associated Telecommunications Cable Tray(s) (minimum #6 AWG insulated copper bonding conductor).
 - 5) Telecommunications Conduit(s) Entering TR (minimum #6 AWG insulated copper bonding conductor).
- C. As a minimum, the Contractor shall bond the following devices to the associated TMGB and TGB's using a minimum #6 AWG insulated copper bonding conductor using compression style lugs.

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- 1) Equipment Racks and Cabinets
- 2) TR Cable Ladder and Tray
- 3) Lightning and Surge Protectors
- 4) Coupled bonding Conductors (CBC's)
- 5) Backbone Cable Shields
- 6) Telecommunication and Fiber Cable Shields
- 7) Antenna Cable Shields

◆ END OF SECTION ◆

COMMUNICATIONS EQUIPMENT ROOM FITTINGS

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Equipment rack
- B. Cable management systems

1.2 QUALITY ASSURANCE

- A. All equipment shall be UL listed.
- B. Compliance with the National Electric Code.
- C. Compliance with ANSI/TIA/EIA 568A, 569, 606, 607, and BICSI standards.
- D. All equipment shall comply with latest ANSI/EIA-310 Standard.

1.3 SCOPE

- A. Install wall mounted rack in room 201.
- B. Provide #6 ground to equipment rack.
- C. Provide communications system backboard in rooms 201.

1.4 SYSTEM WARRANTY

- A. System shall carry an industry standard, performance based warranty, by the manufacturer and contractor, for a period of at least 20 years on the horizontal cabling; including patch panels, patch cables, terminations and labor. The remaining portions of the system shall be warranted for a period of one (1) year from the date of substantial completion.

1.5 WORK BY OTHERS

- A. Electrical Contractor shall install new voice and data raceway system including cable tray and rough-in boxes as shown on plans.

2. PART 2 - PRODUCTS

2.1 EQUIPMENT RACK

- A. Rack shall be grounded to ground bar with #6 ground wire.
- B. Wall mounted racks shall be black open frame type and include
 - 1) Rack shall include horizontal cable management per plans.
 - 2) Rack shall be 27U - 51" high and 18" deep.
 - 3) Racks shall have 19" EIA pre-tapped rails.
 - 4) Rack shall be Hubbell HPWWMR24 or equal by Great Lakes or Mid Atlantic.
 - 5) Required Quantity
 - a) Room 201 One (1)

2.2 COMMUNICATIONS BACKBOARDS

- A. Communications boards shall be construction from 4' x 8' x $\frac{3}{4}$ " fire treated plywood as detailed on plans. Each board shall be painted with fire retardant paint as directed by the Architect. Communications backboards shall be connected to the cable tray and communications racks by horizontal and vertical ladder rack to provide support for the communications cabling. Provide a #6 copper grounding conductor between each communications board and the building electrical grounding system. Terminate at ground bar on each new board.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. All work shall be completed in compliance with ANSI/TIA/EIA and BICSI Standards.

3.2 LABELING

- A. All racks, patch panels, cables, jacks, system components, etc. shall be labeled according to ANSI/EIA/TIA-606 specifications and in coordination with the owner/architect.

3.3 GROUND AND BONDING

- A. The wall mounting frame and data cabinets shall accommodate a grounding conductor that will provide a low DC resistance path to ground. The grounding conductor shall not be less than No. 6 AWG copper, and shall meet NBC Article 250 requirements. The frame and cabinet grounding conductor shall be bonded to an isolated grounding system originating from the service entrance grounding point.
- B. Upon completion of the installation of the data/communication grounding system, the Contractor shall perform standard ground resistance tests with an approved ground resistance test equipment and procedures. Where test show resistance to ground is 5 ohms or greater, the contractor shall take appropriate action to reduce the ground resistance to less than 5 ohms. The Contractor shall then re-test to demonstrate compliance.
- C. Record test results and provide description of test procedures for submission to Engineer for approval.

◆ END OF SECTION ◆

COMMUNICATIONS OPTICAL FIBER BACKBONE CABLING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Inter-building optical fiber backbone cable
- B. Optical fiber terminations
- C. Optical fiber patch panel system

1.2 QUALITY ASSURANCE

- A. All equipment shall be UL listed.
- B. Compliance with the National Electric Code.
- C. Compliance with EIA/TIA 568A, 569, 606, 607, and BICSI standards.
- D. All single-mode fiber equipment shall comply with ANSI/TIA/EIA -492CAAA or latest specification.

1.3 SCOPE

- A. Provide fiber optic patch panel systems.
- B. Splice/Terminate all fiber strands.
- C. Test all cabling in accordance with ANSI/EIA/TIA Standards.
- D. Provide 6 strand single-mode fiber inter-building trunk between Mechanical 201 and Maintenance Building 1 wiring closet as shown on plans.

1.4 SYSTEM WARRANTY

- A. System shall carry an industry standard, performance based warranty, by the manufacturer and contractor, for a period of at least 20 years on the fiber optic cabling; including patch panels, patch cables, terminations and labor. The remaining portions of the system shall be warranted for a period of one (1) year from the date of substantial completion.

1.5 WORK BY OTHERS

- A. Electrical Contractor shall install backbone raceway system including cable tray and underground pathway system.

2. PART 2 - PRODUCTS

2.1 INTER-BUILDING OPTICAL FIBER BACKBONE

- A. The fiber optic backbone between Mechanical 201 and Maintenance Building 1 wiring closet, located on the same campus, shall be constructed with tight buffered, gel-filled or indoor/outdoor rated fiber-optic cable. Standard of quality for cable shall be manufactured by Siecor, Berk-Tek, Mohawk, Superior Essex, or Optical Cable Corp. The proposed cables must meet or exceed the specifications given below:

1) Tight Buffered - Single-mode – OS2

a)	No. of Fiber Strands =	6
b)	Fiber Type =	.9/125 um, Plenum
c)	Attenuation 1310 nm =	0.70 dB/km
d)	Attenuation 1550 nm =	0.70 dB/km
e)	Standards =	Must be UL-listed, TIA-492 CAAB

2.2 FIBER OPTIC PATCH PANEL SYSTEMS

- A. Fiber patch panels shall be rack mounted at 19 inch wide.
- B. Terminate both ends of fiber backbone at rack or cabinet.
- 1) Distribution Shelf and Splice Tray
- a) Standard Features = Hinged front & rear doors. Universal shelf mounting brackets for frame or wall mount. Blank Label for identifying.
- b) Quantity Required:
- [1] One (1) with a capacity of 24 ports.
- 2) Coupling Panel
- a) Port Capacity = 6
- b) Type = LC

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. All work shall be completed in compliance with ANSI/EIA/TIA and BICSI Standards.
- B. All cable must be free of tension at both ends as well as over the length of the run. In cases where a cable must bear some stress, "Kellem" grips shall be used to spread the strain over a longer length of the cable.
- C. Cable ties and supports shall not pinch, bind, crimp or in any way cause physical damage to, or cause electrical characteristic alterations to the data/telecommunication cables.

- D. Cabling Contractor shall take care to assure that during and upon completion of the installation, all cables are free of kinks, sharp bends, twists, gouges, cuts or any other physical damage which may cause physical or electrical characteristic alterations to the cables.
- E. Cabling Contractor shall observe all minimum bend radius and tension limitations, etc, as specified by the cable manufacturer when re installing the cables.
- F. Where cables pass through walls, the Contractor shall provide the minimum clearance hold required or sleeve to pass the cables through. Contractor shall patch an repair any holes, removals, adds or other damage and paint to match.
- G. All cutting, patching and restoration to the original condition of walls, ceilings, floors, etc., shall be the responsibility of the Cabling Contractor.
- H. All ceiling removal and restoration required for the execution of this work shall be the responsibility of the Cabling Contractor.
- I. Cables that require service loops or additional length shall be coiled at 200% of their recommended minimum bend radius. The coil shall then be cable tied and attached to a nearby support. The coil shall be located, if possible, above the workstation, and tagged with the cable number.

3.2 LABELING

- A. All racks, patch panels, cables, jacks, system components, etc. shall be labeled according to ANSI/EIA/TIA-606 specifications and in coordination with the owner/architect.
- B. All fiber optic cables shall be equipped with a self-laminating, wrap-around, machine printed label at both ends of the cable.
- C. All patch panels shall be equipped with pre-printed cable identification designation strips installed behind clear plastic label holders on the front of the patch panel.

3.3 SYSTEM TESTING

- A. Tests shall be performed with all connectors installed.
- B. All fiber-optic cables shall be tested with both a power meter and an OTDR.
- C. All fiber cables shall tested in accordance with TIA 526, "Standard Test Procedures for Optic Fiber Systems."
- D. The Contractor shall prepare complete cable test reports for all installed cable for review and acceptance by the Engineer prior to acceptance of the cabling system.
- E. A copy of the final completed and reviewed cable test reports shall be enclosed in clear vinyl protective covers and posted in the wiring closet and/or as directed by the Owner/Engineer for use and reference by the Owner.

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- F. Copies of cable certification report along with as built drawings shall be submitted to the Architect at time of final acceptance.

◆ END OF SECTION ◆

4.

COMMUNICATIONS COPPER HORIZONTAL CABLING

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Modular Voice/Data Jacks
- B. Modular Cover plates
- C. Horizontal Voice/Data Cable
- D. Patch Panels

1.2 QUALITY ASSURANCE

- A. All equipment shall be UL listed.
- B. Compliance with the National Electric Code.
- C. Compliance with EIA/TIA 568A, 569, 606, 607, 862 and BICSI standards.
- D. All equipment shall meet Category 6 transmission performance as specified.
- E. All connecting equipment shall be from same manufacturer.

1.3 SCOPE

- A. Provide CAT 6 data and Voip cables to jacks shown on plans.
- B. Provide modular jacks with cover plates at each jack location as shown on plans.
- C. Provide patch panels for all voice and data cables as shown on plans.
- D. Terminate all cables at jacks and patch panels.
- E. Test all cabling in accordance with ANSI/EIA/TIA Standards.
- F. Provide patch cables per schedules.

1.4 SYSTEM WARRANTY

- A. System shall carry an industry standard, performance based warranty, by the manufacturer and contractor, for a period of at least 20 years on the horizontal cabling; including patch panels, patch cables, terminations and labor. The remaining portions of the system shall be warranted for a period of one (1) year from the date of substantial completion.

1.5 WORK BY OTHERS

- A. Electrical Contractor shall install new voice and data raceway system including cable tray and rough-in boxes as shown on plans and specified below.
- B. All raceways shall be a minimum of 3/4" conduit unless noted otherwise and shall extend from communications jack location to cable tray as shown on plans. All raceways longer than 10 feet shall include pull strings.

2. PART 2 - PRODUCTS

2.1 VOICE AND DATA JACKS

A. DATA & VOIP JACKS

- 1) Data jacks shall be 8 position configurations.
- 2) Data jacks shall be modular in design.
- 3) Data jacks shall be flush mounted modular type.
- 4) Data jacks shall be RJ45 type - CAT 6 Rated - 568B
- 5) Color shall be blue, white or yellow and noted on plans.
- 6) Category 6 modular jacks by Leviton part number 61110-RE6, Legrand (Ortronics) part number OR-HDJ6 or Hubbell part number HXJ6BL. Panduit is approved as a Manufacturer.

B. WIRELESS ACCESS POINT DATA JACKS

- 1) Data jacks shall be 8 position configurations.
- 2) Data jacks shall be modular in design.
- 3) Data jacks shall be flush mounted modular type.
- 4) Data jacks shall be RJ45 type - CAT 6 Rated - 568B
- 5) Color shall be Blue.

2.2 COVER PLATES

- A. Plates shall be high-impact, modular, fire retardant plastic type.
- B. Plates shall be modular to match to telephone and data jack.
 - 1) Plates shall be equal to Leviton Part No. 42080-1W, Hubbell part number IFP11W or Legrand (Ortronics) part number OR-403HDJ11 for single gang plates. Panduit is approved as a Manufacturer.

- 2) Plates shall be equal to Leviton part number 42080-2W, Hubbell part number IFP12W, or Legrand (Ortronics) part number OR-403HDJ12 for double gang plates. Panduit is approved as a Manufacturer.

D. Coordinate plate color with owner and architect.

2.3 HORIZONTAL CABLE

- A. All horizontal voice and data copper cable shall be 4 PR twisted unshielded (UTP).
- B. Cable shall be 24 AWG, solid bare copper.
- C. Cable shall be insulated with FEP material.
- D. Cable shall be air plenum 1459 CMP rated.
- E. Cable shall be sequentially marked at 2 foot intervals.
- F. Wire pair shall be color coded:
 - 1) pair 1 - white/blue and blue
 - 2) pair 2 - white/orange and orange
 - 3) pair 3 - white/green and green
 - 4) pair 4 - white/brown and brown
- G. Cable shall be category 6 performance rated.
- H. Category 6 Cable shall have a black jacket.
- I. Cable shall be manufactured by Hubbell, Berk-Tek, Superior Essex, or approved equal. General Cable is approved as a Manufacturer.

2.4 COPPER PATCH PANELS

- A. Provide (2) 48 port Rj45 patch panels with 2 racks for 24 port per unit. Provide (2) 24 port Rj45 patch panels with 1 racks for 24 port per unit.
- B. (48) Patch Panel shall be:
 - 1) Type = Category 6
 - a) Standards = EIA/TIA 568, UL Listed
 - b) Mounting = Mounts on EIA 19" Rack
 - c) Termination = PC-mounted D-4 110 Connector

- d) No. of Port = 48-port RJ-45
- e) Required Quantity: = Two (2) – 48 Port

- 2) Patch Panel by Leviton part number 69586-L48, Legrand (Ortronics) part number OR-PHD66U48 or Hubbell HP648. Panduit is approved as a Manufacturer.

C. (24) Patch Panel shall be:

- 1) Type = Category 6
 - a) Standards = EIA/TIA 568, UL Listed
 - b) Mounting = Mounts on EIA 19" Rack
 - c) Termination = PC-mounted D-4 110 Connector
 - d) No. of Port = 24-port RJ-45
 - e) Required Quantity: = Two (2) – 24 Port
- 2) Patch Panel by Leviton part number 69586-L48, Legrand (Ortronics) part number OR-PHD66U24 or Hubbell HP624. Panduit is approved as a Manufacturer.

C. Patch panels shall have rear cable-management mechanisms and front label strips.

2.5 COPPER PATCH CABLES

A. Patch Cable

- 1) Type = Category 6
 - a) Standard = EIA/TIA 568, UL Listed
 - b) Length = TBD
 - c) Required Quantity: = TBD

2.6 UNINTERRUPTABLE POWER SUPPLIES (UPS)

- A. UPS equipment utilized to protect the systems shall provide enough power to run the systems for at least 10 minutes with a minimum of 20% remaining capacity. The UPS devices should also accommodate connections to servers, if present, to allow for a controlled shutdown in the event of a total power failure.

- B. UPS sizing to be included with this bid shall be calculated by the bidder for the equipment bid and provide the back-up capabilities as described in Section A above for all equipment in the rack.
- C. It is the responsibility of the bidder to correctly match all equipment plug types with UPS input plug types according to manufacturers' recommendations. Field modifications to UPS or Telecommunications equipment line cords or plugs is not permitted.
- D. Individual UPS unit not to exceed a maximum of 30A-240V 1-phase input power.
- E. UPS equipment manufactures to be considered are APC, Tripp Lite, and Chloride.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. All work shall be completed in compliance with EIA/TIA and BICSI Standards.
- B. All cable shall be free of tension at both ends as well as over the length of the run. In cases where a cable must bear some stress, "Kellem" grips shall be used to spread the strain over a longer length of the cable.
- C. Cable ties and supports shall not pinch, bind, crimp or in any way cause physical damage to, or cause electrical characteristic alterations to the data/telecommunication cables.
- D. Cabling Contractor shall take care to assure that during and upon completion of the installation, all cables are free of kinks, sharp bends, twists, gouges, cuts or any other physical damage which may cause physical or electrical characteristic alterations to the cables.
- E. Cabling Contractor shall observe all minimum bend radius and tension limitations, etc, as specified by the cable manufacturer when reinstalling the cables.
- F. Where cables pass through walls, the Contractor shall provide the minimum clearance hold required or sleeve to pass the cables through. Contractor shall patch an repair any holes, removals, adds or other damage and paint to match.
- G. All cutting, patching and restoration to the original condition of walls, ceilings, floors, etc., shall be the responsibility of the Cabling Contractor.
- H. All ceiling removal and restoration required for the execution of this work shall be the responsibility of the Cabling Contractor.
- I. Cables that require service loops or additional length shall be coiled at 200% of their recommended minimum bend radius. The coil shall then be cable tied and

attached to a nearby support. The coil shall be located, if possible, above the workstation, and tagged with the cable number.

- J. All power devices or power sources emit a certain amount of electromagnetic interference (commonly called EMI). To reduce or eliminate the field effect of this EMI on data traffic on a given cable channel, cable runs shall be kept a minimum distance from these sources. In addition, running through the center of the building minimizes the external interference (EMI).

- 1) Minimum clearance distance requirements:

- a) 5" (125mm) from power lines of 2 KVA or less
- b) 12" (305 mm) from high voltage lighting (including fluorescent)
- c) 39" (1 m) from power lines of 5 KVA or greater
- d) 48" (1.2 m) from transformers and motors 5KVA and Larger.

3.2 LABELING

- A. All racks, patch panels, cables, jacks, system components, etc. shall be labeled according to ANSI/EIA/TIA-606 specifications and in coordination with the owner/architect.
- B. All cables shall be equipped with a self-laminating, wrap-around, machine printed label at both ends of the cable.
- C. All patch panels shall be equipped with pre-printed cable identification designation strips installed behind clear plastic label holders on the front of the patch panel.
- D. All modular faceplates shall be equipped with a pre-printed cable identification strip installed behind a clear plastic label holder.

3.3 SYSTEM TESTING

- A. Upon completion of the cable installation, the Contractor shall perform complete cable certification tests including but not limited to:
 - 1) Continuity checks on each cable, checking for opens and shorts between conductors
 - 2) Cable length
 - 3) Correct pair polarity.
- B. Tests shall be performed at terminated patch panel.
- C. The Contractor shall prepare complete cable test reports for all installed cable for review and acceptance by the Engineer prior to acceptance of the cabling system.

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- D. All Category 6 UTP cable shall be tested in accordance with TIA/EIA 568-B.2 or latest Standards using a Level III compliant tester. All cabling shall be tested and certified to comply with these standards.
- E. Copies of cable certification report along with as built drawings shall be submitted to the Architect at time of final acceptance.

◆ END OF SECTION ◆

1. PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Network Video Recorder (NVR)
- B. Cameras

1.2 QUALITY ASSURANCE

- A. NFPA 730 – Guide for Premises Security
- B. NFPA 731 – Standard for Installation of Electronic Premises Security Systems
- C. Compliance with the National Electric Code.
- D. BICSI Telecommunications Distribution Manual (TDMM) Latest Version

1.3 SCOPE

- A. Install a completely functional video surveillance system including network video recorder, cameras, and system programming and configuration, testing and commissioning.
- B. Install and connect CCTV cameras per drawings at the associated network drop location.
- C. System shall allow local and remote operational control and viewing of all cameras.
- D. All IP systems to provide a minimum of 8MP camera video technology.
- E. All patch cables will be supplied and included in this contract.
- F. All head-end equipment shall be located at the tech rack. While a computer can be used for management and recording, it is not a requirement for basic operation of an NVR system. If the NVR system selected requires a computer, coordinate with the owner what computer will host the camera system. Provide a connection between the tech rack and the host computer as required.
- G. Contractor shall be responsible to obtain and pay for all licenses, permits, and inspections that are required. No subscription based fees allowed.
- H. Contractor shall adjust all cameras to cover the appropriate field of view as approved by the owners representative before final approval of the system.
- I. Install an independent people counter system with remote monitoring.
- J. Acceptance of security camera system shall be subject to owners approval.

1.4 SUBMITTALS

A. Product Data to be Submitted Before Work Begins

- 1) NVR Cut Sheets
- 2) Camera Cut Sheets for each Model

1.5 SYSTEM WARRANTY

- A. Contractor shall provide a complete labor and installation warranty on all products associated with this purchase, for a period of one (1) year following acceptance of the entire system.

1.6 WORK BY OTHERS

- A. Horizontal network cabling will be provided and installed by the electrical contractor.
- B. Network jacks will be provided and installed by the electrical contractor.
- C. Network patch panel will be provided and installed by the electrical contractor.
- D. Network cabinet will be provided and installed by the electrical contractor.

2. PART 2 - PRODUCTS

2.1 NETWORK VIDEO RECORDER (NVR)

- A. The NVR shall be capable of connecting eight (8) CCTV Cameras.
- B. The NVR shall provide PoE power on each port to the CCTV cameras.
- C. The system shall support the ability to record based on motion or record 24/7.
- D. The NVR shall provide VGA and HDMI outputs for direct viewing.
- E. The NVR shall provide a network data port to provide IP access to remote view live and recorded video from the NVR.
- F. The NVR shall include 2TB of internal storage.
- G. The NVR shall include two (2) USB ports for connection of SATA external storage devices.

2.2 CAMERAS

- A. Provide as required on the drawings CCTV cameras that meet the following specifications.

- 1) Indoor/outdoor IP cameras
- 2) 4K/8 MP resolution.
- 3) Up to 30 fps.
- 4) H.265 Video Compression
- 5) Local storage on micro SD
- 6) IR illumination
- 7) PoE
- 8) Cameras shall have 2.8MM lens

2.3 PATCH CABLES

- A. Provide CAT6 patch cables for CCTV cameras at the camera and at the patch panel to the NVR.
- B. Provide CAT6 patch cables.
- C. Complete system shall be manufactured by GW Security; GW8177MIC6-2T, Sure Vision; SV-8IPTD4-N, Cantek Plus; CTPK-NH41B6-4T or engineer approved equal.
 - 1) Hanwha is an approved equal as long as they abide by all specifications and project requirements.

2.4 PEOPLE COUNTER

- A. Provide (2) people counter devices at each entry door as indicated on plans.
- B. Device shall be pendant mount from the ceiling, off set a minimum of 10' from the right or left of the door being monitored.
- C. Each device to have a remote enclosure for the controller, within 3' of the device
- D. Cat 6 cable to run from camera to controller, then Cat 6 cable from the controller to the tech rack.
- E. People counter shall be capable of capturing individuals or people groups.
- F. System shall be capable of remote monitoring, a data reporting.
- G. Contractor to provide the first year of service subscription.

3. PART 3 - EXECUTION

3.1 INSTALLATION

- A. All cables, jacks, patch panels, switches, cameras, NVR's, storage equipment, and jumpers shall be installed in a neat and organized method.
- B. Any damage, holes, chips, or cracks in the walls, ceilings, floors, or other structural or finished materials of the building caused by the installation of CCTV equipment shall be repaired by the contractor or a sub-contractor.
- C. The equipment supplied shall be installed as a complete working system.
- D. Installation shall include video labeling of all cameras for easy recognition by the owner when monitoring or reviewing camera displays.
- E. All work shall be completed in compliance with ANSI/TIA/EIA and BICSI Standards.

3.2 LABELING

- A. All racks, patch panels, cables, jacks, system components, etc. shall be labeled according to ANSI/EIA/TIA-606 specifications and in coordination with the owner/architect.

3.3 TESTING

- A. Upon completion of work, the installation is to be entirely free of ground faults, short circuits, and open circuits.
- B. Perform a thorough operational test of all systems and interfaces.
- C. Contractor shall immediately rectify or correct minor performance and programming issues discovered during testing.
- D. Configure all live view and recording parameters for the system.
- E. A punch list will be established for all nonconforming tests and will be forwarded to the contractor. The contractor will rectify, correct, or reply to all nonconforming issues on the punch list and all items on the list must be remedied and accepted by the engineer for the work to be accepted as complete.
- F. All cameras shall be viewed and accepted by the owner as capturing the area that is required to be viewed.

3.4 TRAINING

- A. Provide a minimum of one (1) hour of training for the owner that cover the following topics:
 - 1) Operation, maintenance and upgrade procedures.

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◆ END OF SECTION ◆