PROJECT MANUAL

Pickerington Public Library – Main Branch
RENOVATION

Pickerington, Ohio

COMMISSION NO. 22030.00

March 15, 2023

Lorne D. Eisen, License #2018042
Expiration Date, 12/31/2023

ARCHITECT
DESIGNGROUP
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Legal Ad

Sealed bids will be received no later than 12:00 noon, local time, Wednesday, May 10th, 2023 at the Fiscal Officer's Office, Pickerington Public Library, 201 Opportunity Way, Pickerington, OH 43147. They will be publicly opened and read at 12:15 pm at that location, for all labor, material and services necessary for the Main Library Remodel (Construction cost estimate $231,600), all in accordance with Contract Documents prepared by DesignGroup. Direct all questions to Joseph Mayer, Senior Principal Designer, DesignGroup 614.255.2242, jmayer@designgroup.us.com. Contract documents may be examined at the Library, 201 Opportunity Way, Pickerington, and will be provided electronically at no cost upon request to Tony Howard at thoward@pickeringtonlibrary.org.

Each bid must include a Bid Guaranty as described in the Instructions to Bidders; Ohio prevailing wage rates are required.

Pre-bid meeting: Tuesday April 11th, 2023 at 12:00 pm, at Pickerington Public Library, 201 Opportunity Way, Pickerington.

No bid may be withdrawn within 60 days after the bid opening. The Library reserves the right to waive irregularities, reject any or all bids, and to investigate bidder responsibility.

INSTRUCTIONS TO BIDDERS

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A. BIDDER'S PLEDGE AND AGREEMENT

1. **Each Bidder acknowledges that this is a public project involving public funds and that the Owner expects and requires that each successful Bidder adhere to the highest ethical and performance standards. Each Bidder by submitting a bid pledges and agrees that (a) it will act at all times with absolute integrity and truthfulness in its dealings with the Owner and the Design Professional, (b) it will use its best efforts to cooperate with the Owner and the Design Professional and all other Contractors on the Project and at all times will act with professionalism and dignity in its dealings with the Owner, Design Professional, and other Contractors, (c) it will assign only competent supervisors and workers to the Project, each of whom is fully qualified to perform the tasks that are assigned to him/her, and (d) it has read, understands and will comply with the terms of the Contract Documents.**

B. EXAMINATION OF CONTRACT DOCUMENTS AND SITE CONDITIONS AND RELIANCE UPON TECHNICAL DATA

1. Each Bidder shall have a competent person carefully and diligently review each part of the Contract Documents, including the Divisions of the Specifications and parts of the Drawings that are not directly applicable to the Work on which the Bidder is submitting its bid. By submitting its bid, each Bidder represents and agrees, based upon its careful and diligent review of the Contract Documents, that it is not aware of any conflicts, inconsistencies, errors, or omissions in the Contract Documents for which it has not notified the Design Professional in writing at least ten (10) days prior to the bid opening. If there are any such conflicts, inconsistencies, errors, or omissions in the Contract Documents, the Bidder (i) will provide the labor, equipment, or materials of the better quality or greater quantity of Work and/or (ii) will comply with the more stringent requirements. The Bidder will not be entitled to any Change Order, additional compensation, or additional time on account of such conditions for any conflicts, inconsistencies, errors, or omissions that would have been discovered by such careful and diligent review, unless it has given prior written notice to the Design Professional.

2. Each Bidder shall have a competent person carefully and diligently inspect and examine the entire site and the surrounding area, including all parts of the site applicable to the Work for which it is submitting its bid, including location, condition, and layout of the site and the location of utilities, and carefully correlate the results of the inspection with the requirements of the Contract Documents. The Bidder's bid shall include all costs attributable to site and surrounding area conditions that would have been discovered by such careful and diligent inspection and examination of the site and the surrounding area, and the Bidder shall not be entitled to any Change Order, additional compensation, or additional time on account of such conditions.

3. The Bidder may rely upon the general accuracy of any technical data identified in the Owner-Contractor Agreement (e.g., any soils exploration reports, soil boring logs, site survey, or abatement reports) in preparing its bid, but such technical data are not part of the Contract Documents. Except for the limited reliance described in the preceding sentence, Bidder may not, if awarded a contract for the Work, rely upon or make any Claim against the Owner or Design Professional, or any of their agents or employees, with respect to any of the following:

    (a) the completeness of such reports and drawings for Bidder's purposes, including, but not limited to, any aspects of the means, methods, techniques, sequences, and procedures of construction to be employed by the successful Bidder and safety precautions and programs incident thereto; or

(b) any interpretation by the successful Bidder of or conclusion drawn from any technical data or any such other data, interpretations, opinions, or information. For example, all interpolations and extrapolations of data performed by the Bidder to estimate locations or quantities of subsurface strata are independent factual assumptions, which Owner does not warrant.

4. Each Bidder will be deemed to have actual knowledge of all information provided or discussed at the pre-bid meeting.

C. PROJECT

1. The Project is the Pickerington Public Library Main Library Remodel Project ("the Project"). The Project and Work for the Project consists of remodeling the Main Library in accordance with the Drawings and Specifications prepared by the Design Professional.

2. The Design Professional for the Project is:

DesignGroup
515 East Main St
Columbus, Ohio 43215
Phone: 614.255.2253
Contact: Nikki Wildman, RA, LEED AP BD+C nwildman@designgroup.us.com

D. WORK

1. Only one contract will be issued by the Owner for constructing the Project, the General Contract, which will cover all scopes of work necessary to construct the Project.

2. The Contractor awarded the General Contract (General Contractor) will be responsible for the performance and coordination of any and all subcontractors and suppliers either directly or indirectly contracted with the General Contractor.

3. Owner may provide Bidders access to the Project site to conduct such examinations, investigations, explorations, tests, and studies as Bidder deems necessary for submission of a Bid. Bidder shall fill all holes and clean up and restore the Site to its former condition upon completion of such explorations, investigations, tests, and studies. Bidder shall comply with all applicable Laws and Regulations and Owner's policies relative to excavation and utility locates. Bidders must follow COVID-19 safety protocols required by law or requested by the Owner. Bidders may visit the site during the pre-bid meeting.

E. ESTIMATE OF COST

The total estimated construction cost for the base bid is **$231,600.00**

F. CONTRACT DOCUMENTS AND PRE-BID MEETING

1. The Contract Documents consist of the Contract Documents listed in Section 1 of the Owner-Contractor Agreement.

2. Contract documents may be examined at the Library, 201 Opportunity Way, Pickerington, and will be provided electronically at no cost upon request to Tony Howard at thoward@pickeringtonlibrary.org.

3. Bidders shall use complete sets of Contract Documents in preparing bids. Neither the Owner nor the Design Professional assumes any responsibility for errors or misinterpretations resulting from the use of incomplete sets of Contract Documents.

4. The Owner or the Design Professional, in making the Contract Documents available on the above terms, does so only for the purpose of obtaining bids on the Work and does not confer a license or grant for any other use.

5. A pre-bid conference will be held **Tuesday, April 11th, 2023 at 12:00 pm, at Pickerington Public Library, 201 Opportunity Way, Pickerington**.

6. Attendance is highly recommended. The Owner shall not be held liable if a bidder is unable to attend due to technical or other issues or obstructions.

G. PREPARATION OF BIDS

1. All bids must be submitted on the "Bid Form" furnished with the Contract Documents.

2. All blank spaces shall be filled in, in ink or typewritten, in words and figures, and in figures only where no space is provided for words, and signed by the Bidder. The wording on the Bid Form shall be used without change, alteration, or addition. Any change in the wording or omission of specified accompanying documents may cause the bid to be rejected. If there is an inconsistency or conflict in the bid amount, the lowest amount shall control, whether expressed in numbers or words.

3. Bidders shall note receipt of Addenda on the Bid Form. If the Bidder fails to acknowledge receipt of each Addendum, the Bid shall be deemed non-responsive, unless the Bid amount clearly and unambiguously reflects receipt of the Addendum or the Addendum involves only a matter of form and does not materially affect the price, quantity or quality of the Work to be performed.

4. Each Bidder shall submit **3 copies** of its bid to the Owner. The Bid Form shall be signed with the name typed or printed below the signature. A Bid shall not be submitted by facsimile transmission or any other electronic means. A Bidder that is a corporation shall sign its bid with the legal name of the corporation followed by the name of the state of incorporation and the legal signature of an officer authorized to bind the corporation to a contract.

5. Bids shall be enclosed in a sealed opaque envelope with the Bidder's name, plainly marked on the outside "SEALED BID ENCLOSED FOR PICKERINGTON PUBLIC LIBRARY MAIN LIBRARY REMODEL PROJECT – DELIVER IMMEDIATELY TO THE FISCAL OFFICER," and addressed as follows:

Fiscal Officer's Office
Pickerington Public Library
201 Opportunity Way
Pickerington, OH 43147

Bids must be received at the location designated above before **12:00 noon, local time, Friday May 10, 2023.**

A public bid opening will take place at 12:15 pm at Pickerington Public Library, 201 Opportunity Way, Pickerington, OH 43147.

6. **The completed Bid Form shall be accompanied by the following completed documents:**

   Bid Guaranty and if applicable, Contract Bond (See Paragraph G.8 below.)

   Contractor's Qualification Statement (See Paragraph H.4 below.)

7. The Bidder shall take the following precautions in preparing its bid:

   a. Sign the bid and check to ensure all blank spaces have been filled in with requested information and that the specified accompanying documents (listed in Paragraph G.6 above) have been included in a sealed opaque envelope addressed as described in item Paragraph G.5 above.

   b. When the Bid Form provides for quoting either an addition or deduction for an Alternate item, indicate whether the sum named is an addition or deduction. If it is not indicated, it will be conclusively presumed that the amount is a deduction.

   c. When the Bid Form provides for quoting a unit price, the Bidder should quote the unit price as set forth in the Contract Documents and as described in Paragraph L.1 below.

   d. When applicable, make sure that the Bid Guaranty is properly executed and signed by:

      1) The Bidder
      2) The Surety or Sureties

   e. Make sure that the amount of the Bid Guaranty (if the Bid Guaranty is in the form of a certified check, letter of credit, or cashier's check) is for a specific sum in an amount as instructed in Paragraph G.8.a below. If the Bid Guaranty is in the form of the Bid Guaranty and Contract Bond, the amount may be left blank; if an amount is inserted, it must equal the total of the base bid plus the amount of all add alternates included in the bid. If inserted, then the failure to state an amount equal to the total of the base bid and all add alternates shall make the bid non-responsive if the Owner selects alternates not included in the amount.

   f. Make sure that the appropriate bid package and scope of work is inserted in the correct space on the Bid Guaranty and Contract Bond Form. Failure to include work covered by the bid submitted may make the bid non-responsive.

8. Bonds and Guarantees

   a. Bid Guaranty: Bidder shall furnish a Bid Guaranty, in the form prescribed in Sections 153.54, 153.57, and 153.571 of the Ohio Revised Code, in the form of either: (1) a bond for the full amount of the Base Bid plus the amount of all Add Alternates included in the Bidder's bid, in the form of the Bid Guaranty and Contract Bond included in the Contract Documents; or (2) a certified check, cashier's check, or irrevocable letter of credit in a form satisfactory to the Owner in an amount equal to 10% of the bid. Bid amount shall be the total of all sums bid, including all add alternatives, but excluding all deduct alternatives. NOTE: AIA or EJCDC Bid Bond forms are not acceptable.

   b. Contract Bond: The successful Bidder, who, as a Bid Guaranty, submits a certified check, cashier's check, or irrevocable letter of credit in an amount equal to 10% of the bid, shall furnish a Contract Bond in the form Contract Bond included in the Contract Documents in an amount equal to 100% of the Contract Sum. NOTE: AIA or EJCDC Bond forms are not acceptable.

   c. The bond must be issued by a surety company authorized by the Ohio Department of Insurance to transact business in the State of Ohio and acceptable to the Owner. The

bond must be issued by a surety capable of demonstrating a record of competent underwriting, efficient management, adequate reserves, and sound investments. These criteria will be deemed to be met if the surety currently has an A.M. Best Company Policyholders Rating of "A-" or better and has or exceeds the Best Financial Size Category of Class VI. Other sureties may be acceptable to the Owner, in its sole discretion

d. All bonds shall be signed by an authorized agent of an acceptable surety and by the Bidder.

e. Surety bonds shall be supported by credentials showing the Power of Attorney of the agent, a certificate showing the legal right of the Surety Company to do business in the State of Ohio, and a financial statement of the Surety.

f. The Bid Guaranty, as applicable, shall be in the name of or payable to the order of the Owner.

g. The name and address of the Surety and the name and address of the Surety's Agent should be typed or printed on each bond.

H. METHOD OF AWARD

1. **All bids shall remain open for acceptance for sixty (60) days** following the day of the bid opening, but the Owner may, in its sole discretion, release any bid and return the Bid Guaranty prior to that date. The Bid Guaranty shall be subject to forfeiture, as provided in the Ohio Revised Code, if a bid is withdrawn during the period when bids are being held.

2. The Owner reserves the right to reject any, part of any, or all bids and to waive any informalities and irregularities. The Bidder expressly acknowledges this right of the Owner to reject any or all bids or to reject any incomplete or irregular bid. Bidders must furnish all information requested on or accompanying the Bid Form. Failure to do so may result in disqualification of the bid.

3. Determination of the Lowest Responsible Bid. Subject to the right of the Owner to reject any or all bids, the Owner will award the Contract for the Work to the bidder submitting the lowest responsible bid that is responsive to the bidding requirements, taking into consideration accepted alternates. In evaluating bids, the Owner may consider the qualifications of the Bidders, whether or not the bids comply with the prescribed requirements, and alternates and unit prices, if requested, on the Bid Form. The Owner may also consider the qualifications and experience of subcontractors and suppliers. The Owner may conduct such investigations as are deemed necessary to establish the qualifications and financial ability of the Bidder and its subcontractors and suppliers. The factors the Owner may consider in determining which bid is the lowest responsible include the factors set forth below. The Owner, in its discretion, may consider and give such weight to these criteria as it deems appropriate.

   a. The Bidder's work history. The Bidder should have a record of consistent customer satisfaction and of consistent completion of projects, including projects that are comparable to or larger and more complex than the Owner's Project, on time and in accordance with the applicable Contract Documents, and based upon the Bidder's claims history. If the Bidder's management operates or has operated another construction company, the Owner may consider the work history of that company in determining whether the Bidder submitted the lowest responsible bid.

      The Owner will consider the Bidder's prior experience on other projects of similar scope and/or complexity including prior projects with the Owner and/or Design Professional, including the Bidder's demonstrated ability to complete its work on these projects in accordance with the Contract Documents and on time, and will also consider its ability to work with the Owner and Design Professional as a willing, cooperative, and successful team member. Bringing overstated claims, an excessive number of claims, acting uncooperatively, and filing lawsuits against project owners and/or their design

professionals on prior projects of similar scope and/or complexity will be deemed evidence of a Bidder's inability to work with the Owner and Design Professional as a willing, cooperative, and successful team member.

The Bidder authorizes the Owner and its representatives to contact the owners and design professionals (and construction managers, if applicable) on projects on which the Bidder has worked and authorizes and requests such owners and design professionals (and construction managers) to provide the Owner with a candid evaluation of the Bidder's performance. By submitting its bid, the Bidder agrees that if it or any person, directly or indirectly, on its behalf or for its benefit brings an action against any of such owners or design professionals (or construction managers) or the employees of any of them as a result of or related to such candid evaluation, the Bidder will indemnify and hold harmless such owners, design professionals (and construction managers) and the employees of any of them from any claims, whether or not proven, that are part of or are related to such action and from all legal fees and expenses incurred by any of them arising out of or related to such legal action. This obligation is expressly intended for the benefit of such owners, design professionals (and construction managers), and the employees of each of them.

b. The Bidder's financial ability to complete the Contract successfully and on time without resort to its Surety.

c. The Bidder's prior experience with similar work on comparable or more complex projects.

d. The Bidder's prior history for the successful and timely completion of projects, including the Bidder's history of filing claims and having claims filed against it.

e. The Bidder's equipment and facilities.

f. The adequacy, in numbers and experience, of the Bidder's work force to complete the Contract successfully and on time.

g. The Bidder's compliance with federal, state, and local laws, rules, and regulations, including but not limited to the Occupational Safety and Health Act, the Ohio Prevailing Wage laws, and Ohio ethics laws.

h. The Bidder's participation in a drug-free workplace program acceptable to the Owner, and the Bidder's record for both resolved and unresolved findings of the Auditor of State for recovery as defined in Section 9.24 of the Ohio Revised Code.

i. The Owner's prior experience with the Bidder's surety.

j. The Bidder's interest in the Project as evidenced by its attendance at any pre-bid meetings or conferences for bidders.

k. Depending upon the type of the work, other essential factors, as the Owner may determine and as are included in the Specifications.

l. The number of years the Bidder has been actively engaged as a contractor in the construction industry.

m. Financial responsibility demonstrated by the Bidder and whether Bidder possesses adequate resources and availability of credit, the means and ability to procure insurance and acceptable performance bonds required for the Project and whether any claims have been made against performance bonds secured by the bidder on other construction projects.

n. The foregoing information with respect to each of the Subcontractors and Suppliers that the Bidder intends to use on the Project.

4. **<u>Qualifications Statement</u>. Each Bidder will submit with its bid a completed Contractor Qualifications Statement, which is included with the Contract Documents, and thereafter provide the Design Professional promptly with such additional information as the**

Design Professional may request regarding the Bidder's qualifications. A Bidder shall submit any requested additional information within 24 hours of the date on the request.

5. The failure to submit requested information on a timely basis may result in the determination that the Bidder has not submitted the lowest responsible bid.

6. By submitting its bid, the Bidder agrees that the Owner's determination of which bidder is the lowest responsible bidder shall be final and conclusive, and that if the Bidder or any person on its behalf challenges such determination in any legal proceeding, whether or not proven, the Bidder will indemnify and hold the Owner and its employees and agents harmless from any claims included or related to such legal proceeding, whether or not proven, and from legal fees and expenses incurred by the Owner, its employees, or agents that arise out of or are related to such challenge.

7. **After bid opening, within 24 hours of a request made by the Owner or Design Professional, the apparent low Bidder and any other Bidder so requested must submit the following:**

   a. **SUBCONTRACTORS:** For all subcontracts with an estimated value of at least $20,000, a list of all Subcontractors that the Bidder will use to construct the Project, as well as an indication of whether or not the Bidder has ever worked with a proposed Subcontractor before, including the following information for the three most recent projects on which the Bidder and each Subcontractor have worked together:

   - Project Owner
   - Project Name
   - Subcontract Scope
   - Subcontract Value
   - Owner's contact name and phone number.

   If Bidder and a proposed Subcontractor have not worked together on at least three projects in the five years, Bidder must submit the information set forth above for the three most recent similar projects to the Project that a proposed Subcontractor has worked on.

   The above Subcontractor information, as well as the information pertaining to each proposed Subcontractor, shall be used in the Owner's determination of the lowest responsible bid.

   Once a Bidder identifies its proposed Subcontractors as set forth herein, and Owner makes no objections, the list shall not be changed unless written approval of the change is authorized by the Owner and Design Professional.

   b. **FINANCING: The following additional financial information is not a public record under Ohio Revised Code Section 149.43 and will be kept confidential, except under proper order of a court, per Ohio Revised Code Section 9.312(A).**

   i. Provide a financial statement, preferably audited, including your organization's latest balance sheet and income statement showing the following items:

   - Current Assets (e.g., cash, joint venture accounts, accounts receivable, notes receivable, accrued income, deposits, materials inventory and prepaid expenses);
   - Net Fixed Assets;

- Other Assets;
- Current Liabilities (e.g., accounts payable, notes payable, accrued expenses, provision for income taxes, advances, accrued salaries and accrued payroll taxes); and
- Other Liabilities (e.g., capital, capital stock, authorized and outstanding shares par values, earned surplus and retained earnings).

ii. Provide the name and address of firm preparing attached financial statement, and date thereof.

iii. If the attached financial statement is not for the identical organization named in the completed Contractor's Qualification Statement submitted with the bid, explain the relationship and financial responsibility of the organization whose financial statement is provided (e.g., parent-subsidiary).

8. Affidavit as to Personal Property Taxes. Each successful Bidder shall submit, prior to the time of the entry into the Contract, an affidavit in the form required by Section 5719.042, Ohio Revised Code, regarding the status of the Bidder's personal property taxes. A copy of the affidavit form is included with the Contract Documents.
9. No Bidder may withdraw its bid within **sixty (60)** days after the date bids are opened. The Owner reserves the right to waive any formalities or irregularities or to reject any or all bids.
10. The Owner reserves the right to disqualify bids, before or after opening, upon evidence of collusion with intent to defraud or other illegal practices on the part of the Bidder.
11. Award of Contract. The award of the Contract, when required, will only be made pursuant to a duly adopted resolution of the Owner.

I. EXECUTION OF CONTRACT

1. Within the time designated by the Owner or Design Professional after award of the Contract, the successful Bidder shall execute and deliver to the Owner or Design Professional the required number of copies of the Owner-Contractor Agreement, in the form included in the Contract Documents, and all accompanying documents requested, including, but not limited to, a Contract Bond (if applicable), insurance certificates, and a valid Workers' Compensation Certificate. The successful Bidder shall have no property interest or rights under the Owner-Contractor Agreement until the Agreement is executed by the Owner.

J. SUBSTITUTIONS/NON-SPECIFIED PRODUCTS

1. Certain brands of material or apparatus are specified. Each bid will be based on these brands, which may be referred to in the Contract Documents as Standards. The use of another brand (referred to as a substitution or proposed equal in the Contract Documents, when a bidder or the contractor seeks to have a different brand of material or apparatus than that specified approved by the Owner for use in the Project) may be requested as provided herein.

2. The products specified in the Contract Documents establish a standard of required function, dimension, appearance, and quality.

3. Bidders wishing to obtain approval to bid non-specified products shall submit written requests to the Design Professional a minimum of ten (10) calendar days before the bid date and hour. To facilitate the submission of requests, a Pre-Bid Substitution Form is included in the Contract Documents. The Bidder shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution, including the name of the proposed manufacturer and/or product and a complete description of the proposed product including the manufacturer's name and model number or system proposed, drawings, product

literature, performance and test data, color selections or limitations, and any other information necessary for evaluation. Include a statement including any changes in other materials, equipment, or other work that would be required if the proposed product is incorporated in the materials, equipment, or other work that would be required if the proposed product is incorporated in the work. The burden of proof of the merit of the proposed product is on the proposer. The Design Professional's decision on approval of a proposed product will be final.

The following will be cause for rejection of a proposed substitution:

a. Requests submitted by subcontractors, material suppliers, and individuals other than Bidders;

b. Requests submitted without adequate documentation;

c. Requests received after the specified cut-off date.

4. When the Design Professional approves a product submission before receipt of bids, the approval will be included in an Addendum, and Bidders may include the pricing of this product in their bid. Bidders shall not rely on approvals made in any other manner.

5. In proposing a non-specified product or a substitution, the Bidder represents and warrants that each proposed product will not result in any changes to the Project, including changes to the Work of other contractors, or any decrease in the performance of any equipment or systems to be installed in the Project and agrees to pay any additional costs incurred by the Owner and the Owner's consultants as a result of a non-specified or substitute product that is accepted.

6. Following the award of the Contract, there shall be no substitutions for specified products, except pursuant to a Change Order. The Owner in its sole discretion may decline to consider a substitution for a Change Order.

K. ALTERNATES

1. The Owner may request bids on alternates. If the Owner requests bids on alternates, the Bidder should include the cost of the alternates requested on its Bid Form.

2. At the time of awarding the Contract, the Owner will select or reject alternates as it determines is in its best interest. A Bidder's failure to include on its Bid Form the cost of an alternate selected by the Owner and applicable to the Bidder's work shall render the bid non-responsive and be grounds for the rejection of the bid. Otherwise, the failure to include the cost of an alternate will not be deemed material.

3. The Bidder acknowledges that although there is an estimate for the cost of the Project, the market conditions may and frequently do result in the estimate being different from the sum of the bids received, either higher or lower. The Bidder understands that the Owner may include alternates, which may include deduct alternates as well as add alternates, to give it flexibility to build the Project with the funds available. The Bidder further understands and acknowledges that use of add and deduct alternates is a long held customary practice in the construction industry in the State of Ohio. The Bidder also acknowledges that the Owner will not make a decision about the alternates on which to base the award of contracts until the bids are received, and the Owner can compare its available funds with the base bids and the cost or savings from selecting different alternates. The Bidder understands that the award to the Bidder submitting the lowest responsible bid will be based on the lowest base bid plus selected alternates, and may result in an award to a Bidder other than the Bidder that submitted the lowest base bid.

4. If, during the progress of the Work, the Owner desires to reinstate any alternate not included in the Contract, the Owner reserves the right to reinstate the alternate at the price bid by the Contractor provided that such action is taken in sufficient time so as not to delay the progress of the work or cause the Contractor additional expense.

L. UNIT PRICES

1. Where unit prices are requested in the Bid Form the Bidder should quote a unit price. Unless otherwise expressly provided in the Contract Documents, such unit prices shall include all labor, materials, and services necessary for the timely and proper installation of the item for which the unit prices are requested. The unit prices quoted in the bid shall be the basis for any Change Orders entered into under the Owner-Contractor Agreement, unless the Design Professional determines that the use of such unit prices will cause substantial inequity to either the Contractor or the Owner.

M. ADDENDA

1. The Owner reserves the right to issue Addenda changing, altering, or supplementing the Contract Documents prior to the time set for receiving bids. The Design Professional will issue the Addenda to clarify bidders' questions and/or to change, alter, or supplement the Contract Documents.
2. Any explanation, interpretation, correction, or modification of the Contract Documents will be issued in writing in the form of an Addendum, which shall be the only means considered binding; explanations, interpretations, etc., made by any other means shall NOT be legally binding. All Addenda shall become a part of the Contract Documents.
3. Bidders shall submit written questions to Joseph Mayer, AIA, NCARB WELL AP, DesignGroup at jmayer@designgroup.us.com **by 12 Noon, May 4, 2023** to allow sufficient time for the Design Professional to respond. All Addenda will be issued, except as hereafter provided, and e-mailed or otherwise furnished to persons who have obtained Contract Documents for the Project, at least seventy-two (72) hours prior to the published time for the opening of bids, excluding Saturdays, Sundays, and legal holidays. If any Addendum is issued within such seventy-two (72) hour period, then the time for opening of bids shall be extended one (1) week with no further advertising of bids required.
4. Copies of each Addendum will be sent only to the Bidders to whom Contract Documents have been issued and to Plan Rooms where copies of the Contract Documents are maintained. Receipt of Addenda shall be indicated by Bidders in the space provided on the Bid Form. Bidders are responsible for acquiring issued Addenda in time to incorporate them into their bid. Bidders should contact the Design Professional prior to the bid opening to verify the number of Addenda issued.
5. Each Bidder shall carefully read and review the Contract Documents and immediately bring to the attention of the Design Professional any error, omission, inconsistency, or ambiguity therein.
6. If a Bidder fails to indicate receipt of all Addenda through the last Addendum issued by the Design Professional on its Bid Form, the bid of such Bidder will be deemed to be responsive only if:
    a. The bid received clearly indicates that the Bidder received the Addendum, such as where the Addendum added another item to be bid upon and the Bidder submitted a bid on that item; or
    b. The Addendum involves only a matter of form or is one which has either no effect or has merely a trivial or negligible effect on price, quantity, quality, or delivery of the item bid upon.

N. INTERPRETATION

1. If a Bidder contemplating submitting a bid for the proposed Project is in doubt as to the true meaning of any part of the Contract Documents, it may submit a written request for an interpretation thereof to Joseph Mayer, AIA, NCARB WELL AP, DesignGroup at jmayer@designgroup.us.com, DesignGroup **by the deadline for questions per paragraph M.3 above**. Any interpretation of the proposed documents will be made by Addendum only, duly signed by the Design Professional, and a copy of such

Addendum will be mailed or delivered to each Bidder receiving a set of Contract Documents and each plan room where the Contract Documents are maintained. The Owner will not be responsible for any other explanation or interpretation of the proposed documents.

2. In interpreting the Contract Documents, words describing materials that have a well-known technical or trade meaning, unless otherwise specifically defined in the Contract Documents, shall be construed in accordance with the well-known meaning recognized by the trade.

3. Bidders are responsible for notifying the Owner and the Design Professional in a timely manner of any ambiguities, inconsistencies, errors, or omissions in the Contract Documents. The Bidder shall not, at any time after the execution of the Contract, be compensated for a claim alleging insufficient data, incomplete Contract Documents, or incorrectly assumed conditions regarding the nature or character of the Work, if no request was made by the Bidder prior to the bid opening.

O. STATE SALES AND USE TAXES

1. The Owner is a political subdivision of the State of Ohio and is exempt from taxation under the Ohio Sales Tax and Use Tax Laws. Building materials that the successful Bidder purchases for incorporation into the Project will be exempt from state sales and use taxes if the successful Bidder provides a properly completed Ohio Department of Taxation Construction Contract Exemption Certificate to the vendors or suppliers when the materials are acquired. The Owner will execute properly completed certificates on request.

P. DATE FOR SUBSTANTIAL COMPLETION/ DATE FOR FINAL COMPLETION /LIQUIDATED DAMAGES

1. The Date for Substantial Completion (aka Contract Time), Date for Final Completion, and Liquidated Damages shall be as defined and set forth in the Owner-Contractor Agreement. **By submitting its Bid, each Bidder agrees that the period for performing its Work is reasonable**.

Q. OWNER'S RIGHT TO WAIVE DEFECTS AND IRREGULARITIES

1. The Owner reserves the right to waive any and all irregularities provided that the defects and irregularities do not affect the amount of the bid in any material respect or otherwise give the Bidder a competitive advantage.

R. MODIFICATION/WITHDRAWAL OF BIDS

1. Modification. A Bidder may modify its bid by written communication to the Owner addressed to the Owner's Representative at any time prior to the scheduled closing time for receipt of bids, provided such written communication is received by Owner's Representative prior to the bid deadline. The written communication shall not reveal the bid price, but should provide the addition or subtraction or other modification so that the final prices or terms will not be known until the sealed bid is opened. If the Bidder's written instructions with the change in bid reveal the bid amount in any way prior to the bid opening, the bid may be rejected as non-responsive.

2. Withdrawal Prior to Bid Deadline. A Bidder may withdraw its bid at any time for any reason prior to the bid deadline for the opening of bids. The request to withdraw shall be made in writing to and received by the Owner prior to the time of the bid opening.

3. Withdrawal after Bid Deadline.

   a. All bids shall remain valid and open for acceptance for a period of at least 60 days after the bid opening; provided, however, that a Bidder may withdraw its bid from consideration after the bid deadline when all of the following apply:

      (1) the price bid was substantially lower than the other bids;

      (2) the reason for the bid being substantially lower was a clerical mistake, rather than a mistake in judgment, and was due to an unintentional and substantial error in

arithmetic or an unintentional omission of a substantial quantity of work, labor, or material;

(3) the bid was submitted in good faith; and

(4) the Bidder provides written notice to the Owner, to the attention of the Owner's Representative, within two (2) business days after the bid opening for which the right to withdraw is claimed.

b. No bid may be withdrawn under this provision if the result would be the awarding of the contract on another bid for the bid package from which the Bidder is withdrawing its bid to the same Bidder.

c. If a bid is withdrawn under this provision, the Owner may award the Contract to another Bidder determined by the Owner to be the lowest responsible bidder or the Owner may reject all bids and advertise for other bids. In the event the Owner advertises for other bids, the withdrawing Bidder shall pay the costs incurred in connection with the rebidding by the Owner, including the cost of printing new Contract Documents, required advertising, and printing and mailing notices to prospective bidders, if the Owner finds that such costs would not have been incurred but for such withdrawal.

S. COMPLIANCE WITH APPLICABLE LAWS

1. By submitting a bid for Work on the Project, the Bidder acknowledges that it is in compliance with applicable federal, state, and local laws and regulations, including, but not limited to, the following:

   a. Equal Employment Opportunity/Nondiscrimination. The Bidder agrees that if it is awarded a contract that in the hiring of employees for performance of work under the contract or any subcontract, neither it nor any subcontractor, or any person acting on its behalf or its subcontractor's behalf, by reason of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color, shall discriminate against any citizen of the state in the employment of labor or workers who are qualified and available to perform work to which the employment relates. The Bidder further agrees that neither it nor any subcontractor or any person on its behalf or on behalf of any subcontractor, in any manner, shall discriminate against or intimidate any employees hired for the performance of the work under the contract on account of race, creed, sex, disability as defined in Section 4112.01 of the Ohio Revised Code, or color.

   b. Ethics Laws. The Bidder represents that it is familiar with all applicable ethics law requirements, including without limitation Sections 102.04 and 3517.13 of the Ohio Revised Code, and certifies that it is in compliance with such requirements.

T. FINDINGS FOR RECOVERY

1. By submitting its bid, each Bidder certifies for reliance of the Owner that it has no unresolved finding for recovery against it issued by the Auditor of the State of Ohio on or after January 1, 2001, except as permitted by Section 9.24 (F) of the Ohio Revised Code.

U. PREVAILING WAGES

1. The successful Bidder and all of its subcontractors, regardless of tier, will strictly comply with its obligation to pay a rate of wages on the Project not less than the rate of wages fixed for this Project under Section 4115.04 of the Ohio Revised Code. Additionally, the successful Bidder will comply with all other provisions of Chapter 4115 of the Ohio Revised Code.

END OF INSTRUCTIONS TO BIDDERS

BID FORM

1.01 BID SUBMITTED BY:

_____
(Contractor)

Date bid submitted: _____

1.02 DELIVER TO:

Pickerington Public Library Board of Trustees
ATTN: Fiscal Officer
201 Opportunity Way
Pickerington, Ohio 43147

1.03 Having carefully reviewed the Instructions to Bidders, Drawings, Specifications and other Contract Documents for the Project titled **Pickerington Public Library Main Library Remodel Project** including having also received, read, and taken into account the following Addenda:

Addendum No.	Dated
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

and likewise having inspected the site and the conditions affecting and governing the Project, the undersigned hereby proposes to furnish all materials and to perform all labor, as specified and described in the said Specifications and/or as shown on the said Drawings for all Work necessary to complete the Project on a timely basis and in accordance with the Contract Documents regardless of whether expressly provided for in such Specifications and Drawings.

1.04 Before completing the Bid Form, the undersigned represents that it has carefully reviewed the Request for Bids, Instructions to Bidders, this Bid Form, Form of Bid Guaranty and Contract Bond, Contractor's Affidavit (O.R.C. 5719.042), Owner-Contractor Agreement (SHORT FORM OWNER-CONTRACTOR AGREEMENT FOR PROJECTS OF LIMITED SCOPE as modified for the Project), Drawings, Project Specifications, and other Contract Documents. Failure to comply with provisions of the Contract Documents may be cause for disqualification of the bid.

1.05 BONDS AND CONTRACT: If the undersigned is notified of bid acceptance, it agrees to furnish required bonds as indicated in the Instructions to Bidders.

1.06 COMPLETION OF WORK: In submitting a bid, the undersigned agrees to execute the Owner-Contractor Agreement in the form included in the Contract Documents and to complete its Work as required by the Contract Documents.

NOTE A: The wording of the Bid Form shall be used throughout, without change, alteration, or addition. Any change may cause it to be rejected.

NOTE B: Bidder is cautioned to bid only on the Brands or Standards specified.

NOTE C: If there is an inconsistency or conflict in the Bid amount, the lowest amount shall control, whether expressed in numbers or words.

2.01 BID:

Include the cost of all labor and material for the contract listed below. Bidder is to fill in all blanks related to the Bid Package for which a bid is being submitted. If no bid is submitted for an item, leave the item blank or insert "NO BID" in the blank. For alternate items, indicate whether the amount stated is in addition to or a deduction from the base bid amount (if there is no indication whether the amount for an alternate is an addition or a deduction, the amount shall be a deduction).

2.02 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

Lump Sum – All Work

_____ Dollars $_____

(Words) (Figures)

2.03 [Not Used]

2.04 [Not Used]

1.07 INSTRUCTIONS FOR SIGNING

A. The person signing for a sole proprietorship must be the sole proprietor or his authorized representative. The name of the sole proprietor must be shown below.

B. The person signing for a partnership must be a partner or his authorized representative.

C. The person signing for a corporation must be the president, vice president or other authorized representative; or he must show authority, by affidavit, to bind the corporation.

D. The person signing for some other legal entity must show his authority, by affidavit, to bind the legal entity.

1.08 BIDDER CERTIFICATIONS. The Bidder hereby acknowledges that the following representations in this bid are material and not mere recitals:

1. **The Bidder acknowledges that this is a public project involving public funds, and that the Owner expects and requires that each successful Bidder adhere to the highest ethical and performance standards. The Bidder by submitting its bid pledges and agrees that (a) it will act at all times with absolute integrity and truthfulness in its dealings with the Owner and the Design Professional, (b) it will use its best efforts to cooperate with the Owner and the Design Professional and all other Contractors on the Project and at all times will act with professionalism and dignity in its dealings with the Owner, Design Professional and other Contractors, (c) it will assign only competent supervisors and workers to the Project, each of whom is fully qualified to perform the tasks that are assigned to him/her, and (d) it has read, understands and will comply with the terms of the Contract Documents.**

2. The Bidder represents that it has had a competent person carefully and diligently review each part of the Contract Documents, including any Divisions of the Specifications and parts of the Drawings that are not directly applicable to the Work on which the Bidder is submitting its bid. By submitting its bid, each Bidder represents and agrees, based upon its careful and diligent review of the Contract Documents, that it is not aware of any conflicts, inconsistencies, errors or omissions in the Contract Documents for which it has not notified the Design Professional in writing at least seven (7) days prior to the bid opening. If there are any such conflicts, inconsistencies, errors or omissions in the Contract Documents, the Bidder (i) will provide the labor, equipment or materials of the better quality or greater quantity of Work; and/or (ii) will comply with the more stringent requirements. The Bidder will not be entitled to any additional compensation for any conflicts, inconsistencies, errors or omissions that would have been discovered by such careful and diligent review, unless it has given such prior written notice to Design Professional.

3. The Bidder represents that it has had a competent person carefully and diligently inspect and examine the entire site for the Project and the surrounding area, including all parts of the site applicable to the Work for which it is submitting its bid, and carefully correlate the results of the inspection with the requirements of the Contract Documents. The Bidder agrees that its bid shall include all costs attributable to site and surrounding area conditions that would have been discovered by such careful and diligent inspection and examination of the site and the surrounding area, and the Bidder shall not be entitled to any Change Order, additional compensation, or additional time on account of conditions that could have been discovered by such an investigation.

4. The Bidder represents, understands and agrees that a) the Claim procedures in the General Conditions as modified for the Project are material terms of the Contract Documents, b) if it has a Claim, it will have its personnel provide complete and accurate information to complete and submit the Statement of Claim form on a timely basis, c) the proper completion and timely submission of a Statement of Claim form is a condition precedent to any change in the Contract Sum or the Contract Time(s), and d) the proper and timely submission of the Statement of Claim form provides the Owner and the Design Professional with necessary information so that the Owner may investigate the Claim and mitigate its damages.

5. The Bidder represents that the bid contains the name of every person interested therein and is based upon the Standards specified by the Contract Documents.

6. The Bidder and each person signing on behalf of the Bidder certifies, and in the case of a bid by 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, or 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 will 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 will be made by the Bidder to induce any other Person to submit or not to submit a bid for the purpose of restricting competition; and (d) the statements made in this Bid Form are true and correct.

7. The Bidder will execute the form of Owner/Contractor Agreement in the form included with the Contract Documents, if a Contract is awarded on the basis of this bid, and if the Bidder does not execute the Contract Form for any reason, other than as authorized by law, the Bidder and the Bidder's Surety are liable to the Owner.

8. The Bidder certifies that the upon the award of a Contract, the Contractor will ensure that all of the Contractor's employees, while working on the Project site, will not purchase, transfer, use or possess illegal drugs or alcohol or abuse prescription drugs in any way.

9. The Bidder agrees to furnish any information requested by the Design Professional or the Owner's authorized representative to evaluate that the Bidder has submitted the lowest responsible bid and that the bid is responsive to the specifications.

10. The Bidder certifies that it has no unresolved findings for recovery issued by the Auditor of State.

11. The Bidder certifies that it is aware of and in compliance with the requirements of Ohio Revised Code Section 3517.13 regarding campaign contributions.

12. The Bidder further states that it is a duly licensed contractor, for the type of work proposed, in accordance with the local requirements, and that all fees, permits, etc., pursuant to submitting this Bid have been paid in full.

LEGAL NAME OF BIDDER: _____

BIDDER IS (check one): ___sole proprietor ___partnership ___corporation ___other legal entity

NAME & TITLE OF PERSON LEGALLY AUTHORIZED TO BIND BIDDER TO A CONTRACT:

_____

Name Title

DATE SIGNED: _____ SIGNATURE: _____

ADDRESS: _____

_____

TELEPHONE: _____

FAX: _____

FEDERAL TAX I.D. # _____

When the Bidder is a partnership or a joint venture, state name and address of each partner in the partnership or participant in the joint venture below:

_____ _____

_____ _____

Name

_____

Address

_____ _____

_____ _____

Name

_____

Address

_____ _____

_____ _____

Name

_____

Address

_____ _____

_____ _____

Name

_____

Address

_____ _____

_____ _____

Name

_____

Address

END OF SECTION

CONTRACTOR'S QUALIFICATION STATEMENT

SUBMITTED TO: _____
_____
_____
_____

NAME OF PROJECT: Pickerington Public Library Main Library Remodel

SUBMITTED BY: _____

CONTRACTOR PROJECT CONTACT NAME: _____

ADDRESS: _____

EMAIL: _____

PHONE: _____

PRINCIPAL OFFICE: _____

☐ Corporation
☐ Partnership
☐ Individual
☐ Joint Venture
☐ Other

#	Question	Response
1 - Organization		
1.1	How many years has your organization been in business as a Contractor in the construction industry?	
1.2	How many years has your organization been in business under its present business name?	
1.2.1	Under what other or former names has your organization operated?	
1.3	Is your organization a corporation? If yes, answer #1.3.1 – 1.3.6	
1.3.1	Date of incorporation	
1.3.2	State of incorporation	

1.3.3	President's name	
1.3.4	Vice President's name(s)	
1.3.5	Secretary's name	
1.3.6	Treasurer's name	
1.4	Is your organization a partnership? If yes, answer #1.4.1 – 1.4.3	
1.4.1	Date of organization	
1.4.2	Type of partnership (if applicable)	
1.4.3	Name(s) of general partner(s)	
1.5	Is your organization individually owned? If yes, answer #1.5.1 – 1.5.2	
1.5.1	Date of organization	
1.5.2	Name of owner	
1.6	If the form of your organization is other than those listed above, describe it and name the principals.	

2 - Licensing		
2.1	List jurisdictions and trade categories in which your organization is legally qualified to do business, and indicate registration or license numbers, if applicable.	
2.2	List jurisdictions in which your organization's partnership or trade name is filed.	
2.3	List any suspension or revocations of any professional license of any director, officer, owner, or managerial employees of your organization, to the extent that any work to be performed on this Project is within the field of such licensed profession.	
3 - Financing: After bid opening, within 24 hours of a request made by the Owner or Design Professional, the apparent low Bidder and any other Bidder must submit additional financial information as requested.		
4 - References		
4.1	Trade References	

4.2	Bank References	
4.3	Surety – name of bonding company	
4.4	Surety – name and address of agent	
5 – Claims and Organization History		
5.1	Attach your organization's record for both resolved and unresolved findings of the Auditor of the State of Ohio for recovery as defined in Section 9.24 of the Ohio Revised Code. If none, state "none".	
5.2	Does your organization participate in a drug-free workplace program?	
5.3	Has your organization ever failed to complete any work or failed to complete any work by the substantial completion date, final completion date, or in a timely manner? If yes, attach details.	
5.4	Within the last five (5) years has your organization or any of its officers prosecuted any Claims, had any Claims prosecuted against it or them, or been involved in or is currently involved in any mediation or arbitration proceedings or lawsuits related to any construction project, or has any judgments or awards outstanding against it or them? If the answer is yes, please attach the details for each Claim, including the names and telephone numbers of the persons who are parties, the amount of the Claim, the type of Claim and basis for the Claim, and the outcome. Note: As used in this document "Claim" means a Claim initiated under the Contract Documents for a project or relating to the Work for a project, including Claims made against performance bonds secured by the Contractor on other construction projects.	
5.5	Has your organization ever failed to comply with federal, state and local laws, rules and regulations including but not limited to the Occupational Safety and Health Act, the Ohio Prevailing Wage laws, and Ohio ethics laws? If yes, please attach details and reason(s) for each instance and the [illegible]	

5.6	Within the last five years, has any officer or principal of your organization ever been an officer or principal of another organization when it failed to complete a construction contract? If the answer is yes, please attach details for each instance, including the names and telephone numbers of the persons who are parties to the contract, and the reason(s) the contract was not completed.	
5.7	If any of the following members of your organization's management – president, chairman of the board, or any director – operates or has operated another construction company during the last five (5) years, identify the member of management and the name of the construction company.	
5.8	If your organization is operating under a trade name registration with the Secretary of State for the State of Ohio, identify the entity for which the trade name is registered. If none, state "none."	
5.9	If your organization is a division or wholly-owned subsidiary of another entity or has another relationship with another entity, identify the entity of which it is a division or wholly-owned subsidiary or with which it has another relationship and also identify the nature of the relationship. If none, state "not applicable."	
5.10	List any projects within the previous five years where a public entity determined that your organization was not a responsible bidder, including the name of the public entity, the reasons given by the public entity, and an explanation thereof.	
6 - Experience		
6.1	List the categories of work that your organization normally performs with its own forces	

6.2	State average annual amount of construction work your organization has performed during the last five years	
6.3	State total amount of work in progress and under contract	

6.4	Describe the size and experience of your organization's work force and your equipment and facilities, in relation to your organization's ability to complete the Project successfully and on time.	

6.5 In the chart below, provide the following information for each contract your organization has had during the last 5 years, including current contracts, where the Contract Sum is/was 50% or more of the bid amount for this Project, including add alternates.
Include details regarding timeliness of performance and quality of work.

List the original contract price for each project, the amount of any change orders or cost overruns on each, and the reasons for the change orders or cost overruns, and your organization's record for complying with and meeting completion deadlines on construction projects.

If there are more than 10 of these contracts only provide information on the most recent 10 contracts, including current contracts.

Project/Scope of Work	Original Contract Sum	Amount of any change orders or cost overruns and reasons	Completion deadlines met?	Owner's Contact & Telephone Number	Engineer's or Architect's Representative Name & Telephone Number

Project/Scope of Work	Original Contract Sum	Amount of any change orders or cost overruns and reasons	Completion deadlines met?	Owner's Contact & Telephone Number	Engineer's or Architect's Representative Name & Telephone Number

Project/Scope of Work	Original Contract Sum	Amount of any change orders or cost overruns and reasons	Completion deadlines met?	Owner's Contact & Telephone Number	Engineer's or Architect's Representative Name & Telephone Number

6.6 In the chart below, provide the following information for each project your organization has had during the last 5 years, which your organization believes is of comparable or greater size and complexity than the Owner's project. If there are more than 5 of these projects, only provide information on the most recent 5 projects, including current projects.

Project and Scope of Work	Contract Sum	Owner's Contact & Telephone Number	Engineer's or Architect's Representative Name & Telephone Number

6.7 In the chart below, list the construction education, training and construction experience for each person who will fill a management role on the Project, including without limitation the Project Executive, Project Engineer, Project Manager, and Project Superintendent. For each person listed, include with the other information, the last three projects on which the person worked and the name and telephone number of the design professional and the Owner. Attach a separate sheet if necessary, identifying the question number.

Name/Role	Education and Training	Project #1, Owner & A/E Contact, Telephone Number	Project #2, Owner & A/E Contact, Telephone Number	Project #3, Owner & A/E Contact, Telephone Number

6.8	In the chart below, list construction projects your organization has in progress with an original Contract Sum of more than $100,000.00, giving the name of project, owner and its telephone number, design professional and its telephone number, contract amount, percent complete and scheduled completion date. Attach a separate sheet if necessary, identifying the question number.

Project/Scope of Work	Contract Sum	Scheduled Completion Date	% Complete	Owner's Contact & Telephone Number	Engineer's or Architect's Representative Name & Telephone Number

Additional Criteria. The Owner, in its discretion, reserves the right to request additional information and documentation relating to the foregoing and related to any of the criteria listed in the Bidding and Contract Documents after the bid opening. The Owner may consider such information and documentation in determining which bidder is the lowest responsible. The Owner, in its discretion, may consider and give such weight to any and all criteria as it deems appropriate.

Certification. The undersigned certifies for the reliance of the Owner that after diligent investigation, to the best of the undersigned's belief, the information provided with this Contractor's Qualification Statement is true, accurate and not misleading.

SIGNATURE_____

Dated at this _____day of _____, 20__.

Name of Organization: _____

By: _____[PRINT NAME]

Signature: _____

Title: _____

_____, being duly sworn, deposes and says that the information provided herein is true and sufficiently complete so as not to be misleading. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

Subscribed and sworn before me this _____day of _____20__.

_____
Notary Public

My Commission Expires: _____

SEAL

SHORT FORM OWNER-CONTRACTOR AGREEMENT
FOR PROJECTS OF LIMITED SCOPE

Owner:

Pickerington Public Library Board of Trustees
201 Opportunity Way
Pickerington, Ohio 43147

Project: Pickerington Public Library Main Library Remodel Project

Location: 201 Opportunity Way, Pickerington, Ohio 43147

Contractor:

_____
_____
_____

Contact:
Phone: _____
Email: _____
_____

Owner, a political subdivision of the State of Ohio, and Contractor have entered into this Owner-Contractor Agreement ("Agreement") made as of _____ (the "Effective Date"; provided however that if no date is inserted, the Effective Date shall be the date the Agreement is signed by the Owner). The Work was procured through the statutory bidding requirements for public libraries pursuant to the Ohio Revised Code Section 3375.41.

The Project Owner and Contractor agree as follows:

1. WORK.

1.1. Contractor will furnish all the labor, services, materials, plant, equipment, tools, scaffolds, appliances, and all other things (collectively called the "Work") necessary for the timely and proper completion of the Project.

1.2. Contractor must at all times furnish sufficient skilled workers, materials, and equipment to perform the Work in strict conformance with the Contract Documents and to the entire satisfaction of Owner, so as to complete the Project by the Date for Substantial Completion. All materials and equipment provided must be new, free from all defects, fit for the purpose for which intended, and merchantable.

1.3. Contractor will assign a competent Project Supervisor. At the Owner's request, Contractor will replace the Project Supervisor, provided that the request is reasonable. Owner will not be responsible for the acts or omissions of the Project Supervisor or his assistants.

1.4. Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or it make its parts fit together properly.

2. CONTRACT DOCUMENTS.

2.1. The Contract Documents consist exclusively of the following documents incorporated by reference:

A. Legal Notice;
B. Instructions to Bidders;
C. Bid Form;
D. Owner-Contractor Agreement, including all exhibits attached hereto;
E. Drawings and Specifications prepared by DesignGroup, dated October 14, 2022;
F. Executed Bid Guaranty and Contract Bond;
G. Sales & Use Tax/ Construction Contract Exemption Certificate;
H. Statement of Claim Form;
I. Design Professional's Certificate of Substantial Completion;
J. Contractor's Affidavit of Payment or Amounts Withheld;
K. Contractor Waiver and Release Affidavit;
L. Subcontractors/ Suppliers Waiver and Release Affidavit;
M. Subcontractors/ Suppliers Lien Waiver and Release Affidavit;
N. Subcontractors/ Suppliers Final Lien Waiver and Release Affidavit;

O. Pre-Bid Substitution Form;
P. Addenda issued;
Q. Executed Contractor's Personal Property Tax Affidavit (O.R.C. 5719.042);
R. Modifications issued after the execution of the contract, including:
    a. A written amendment to the Agreement signed by both parties;
    b. A Change Order; or
    c. A Construction Change Directive
S. Prevailing Wage Rates

2.2. Contractor will use the State of Ohio Subcontract Form for all subcontracted Work, in accordance with ORC Section 153.503(C) and OAC Section 153:1-3-02.

2.3. Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings. Days shall mean calendar days unless noted otherwise.

3. OWNER REPRESENTATIVE AND DESIGN PROFESSIONAL.

3.1. Design Professional. The Design Professional for this Project is DesignGroup. The Design Professional prepared the drawings and specifications for the Work. The Design Professional will also provide construction administration services for the Project. The Contractor will coordinate with the Design Professional, as instructed by the Owner.

3.2. Tony Howard, Director, is the Owner's Representative with respect to all matters involving Owner.

3.2.1. Except as specifically stated to the contrary elsewhere in this Agreement, Contractor will direct all communications to Owner through the Owner's Representative.

3.3. Contractor will coordinate the Work with the Owner and Owner's separate contractors, consultants, or other agents. Contractor will provide access to the Work at all times.

4. TIME FOR COMPLETION AND PROJECT COORDINATION.

4.1. Contract Time. The Work may commence at contractor's option, at any time after Effective Date of this Agreement., so long as the Date of Final Completion is on or before December 31, 2023. All associated Work shall be completed within 42 calendar days from this Date of Commencement to the Date for Substantial Completion.

4.1.1. Substantial Completion. Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use. Notwithstanding anything in the Contract Documents to the contrary, this shall include, but is not limited to, start up and successful testing of all systems and equipment.

4.1.2. Following Substantial Completion of the Work or a designated portion thereof, as certified by the Design Professional or confirmed by the Owner, and Owner's receipt of consent of the Contractor's surety, if any, the Owner shall make a payment of retainage applying to such Work. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents. The Owner is entitled to withhold 200% of the value of such incomplete or nonconforming Work.

4.1.3. Date of Final Completion. Final Completion shall mean that the Work is complete in all respects in accordance with the Contract Documents and the Contractor has submitted to the Owner all required documents. The date of Final Completion shall be within **21** calendar days from the Date of Substantial Completion and shall be on or before December 31, 2023.

4.2. Time is of the Essence. THE DATES IN THE CONTRACT DOCUMENTS ARE OF THE ESSENCE OF THIS AGREEMENT. CONTRACTOR WILL PROSECUTE ITS WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, INCLUDING ANY AMENDMENTS THERETO.

4.3. Contractor's Construction and Submittal Schedules

4.3.1. The Contractor shall prepare for Owner's review and approval the construction schedule ("Construction Schedule") and a corresponding detailed schedule of values pursuant to the Ohio Revised Code

Section 153.13 within seven (7) calendar days after the Effective Date. The schedule of values must be broken out into labor and materials for each line item. The Contractor shall prepare the Construction Schedule in Critical Path Method ("CPM") format unless provided otherwise in the Contract Documents or otherwise in writing by the Owner. Each major category of Work shall be shown separately in the Construction Schedule with all the significant activities involved, showing durations of time, manpower requirements, and restraints. The Construction Schedule is for the purpose of coordinating the timing, phasing, and sequence of the Work of the Contractor and shall not change or modify the Date for Substantial Completion. The Date for Substantial Completion shall only be changed or modified by Change Order, other Modification, or a Claim that is Finally Resolved, regardless of the dates in the Construction Schedule.

4.3.1.1. The Contractor shall update the Construction Schedule each month;

4.3.1.2. The Construction Schedule shall be manpower loaded;

4.3.1.3. The Contractor shall, on a weekly basis, prepare and submit to the Owner a written report describing the activities begun or finished during the preceding week, Work in progress, expected completion of the Work, a look-ahead projection of all activities to be started or finished in the upcoming two (2) weeks, including without limitation the Contractor's workforce crew size and total resource hours associated with such Work and any other information requested;

4.3.1.4. The float in the Construction Schedule and any updates to it shall belong to the Owner. Float shall mean the amount of time by which activities may be delayed without affecting the Date for Substantial Completion; and

4.3.1.5. The Contractor's obligation to submit requested scheduling information is a material term of its Contract. If the Contractor fails to submit requested scheduling information in writing within five (5) days of a request for such information from the Owner, the Contractor shall pay and the Owner may withhold from the Contractor Liquidated Damages at the rate of Fifty Dollars ($50.00) a day for each calendar day thereafter that the Contractor fails to submit the requested information.

4.3.2. The Contractor shall perform the Work in accordance with the most recent Construction Schedule submitted to the Owner, provided that the Contractor shall comply with any orders under Section 4.3.3. However, preparation of such schedule shall not constitute a waiver of the Owner's rights under the Contract to have the Work completed by the Date for Substantial Completion.

4.3.3. If the Owner determines that the performance of the Work has not progressed so that it is likely that the Contractor will not achieve Substantial Completion of its Work by the Date for Substantial Completion, the Owner shall have the right to order the Contractor to take corrective measures necessary to expedite the Work, including, without limitation: (i) working additional shifts or overtime; (ii) supplying additional manpower, equipment, and facilities, and (iii) other similar measures ("Corrective Measures"). If the Owner orders the Contractor to take such corrective measures, the Contractor shall take and continue such Corrective Measures until the Owner is satisfied that the Contractor is likely to achieve Substantial Completion of its Work by its Date for Substantial Completion.

4.3.3.1. The Contractor shall not be entitled to adjustment in the Contract Sum in connection with the Corrective Measures required by the Owner pursuant to this Section 4.3.3, unless the Contractor is able to establish that it is entitled to additional compensation under the terms of the Contract Documents.

4.4. Delays and Accelerations.

4.4.1. Notice of Delays. Contractor will give Owner written notice of any delay affecting its Work in the form and with the information specified in the Contract Documents within forty-eight (48) hours of the commencement of the delay; provided that the 48-hour notice will be extended to ten (10) days for unusually severe weather conditions not reasonably anticipatable. The failure to give the required notice constitutes an irrevocable waiver of Contractor's right to seek an extension of time and/or additional compensation/damages for the delay.

4.4.2. Acceleration of the Work. Owner may require Contractor to accelerate its Work by adding workers or working additional shifts, extended shifts or overtime, so that the Work is in final form before the Date for Substantial Completion. If Owner requires Contractor to accelerate its Work, Contractor will within five (5) days take the required action, and Owner thereafter will issue a Change Order increasing the Contract Sum to

pay for Contractor's additional costs of accelerating its Work so that the Work is in final form before the Date for Substantial Completion. If there is a dispute as to whether Contractor is entitled to a Change Order for accelerating its Work, Contractor must proceed to accelerate its Work without waiting for a Change Order or payment of any additional compensation, but may reserve its right to make a claim against Owner for its additional costs incurred in accelerating its Work. Contractor's additional costs for accelerating its Work will be determined in accordance with Section 4.4.3.

4.4.3. Compensation for Acceleration of the Work.

4.4.3.1. Owner's Obligation to Pay. When Owner initiates the acceleration of the Work, Owner will pay Contractor, as provided in Section 4.4.3.2, for Contractor accelerating its Work so that its Work is substantially complete by the Date for Substantial Completion. However, when Contractor's Work is ordered to be accelerated as a result of Contractor's own fault or the fault of its subcontractors or suppliers, Owner will not pay Contractor for such acceleration.

4.4.3.2. Compensation for Acceleration of the Work. To the extent that Owner requires Contractor to accelerate its Work so that the Work is in final form before the Date for Substantial Completion, Owner will pay Contractor for Contractor's reasonable additional costs of accelerating its Work, as determined in accordance with this section. The additional costs of accelerating the Work will be (a) any premium for overtime, additional shift work, or extended shift work, (b) the cost of any additional supervision or general conditions required by the acceleration, (c) out of pocket cost of any additional equipment required for the acceleration, (d) to the extent Contractor can document lost productivity due to the acceleration, the cost associated with such lost productivity, and (e) overhead, including home office overhead, and profit equal to 10% of the total amount of the other items for which additional compensation is permitted under this section. The foregoing are the only additional compensation and/or damages Contractor will be entitled to receive for accelerating its Work so that it is complete before the Date for Substantial Completion. As a condition precedent to its recovery of additional compensation, Contractor must provide Owner with full information about the costs of accelerating its Work in the form and format requested by Owner.

5. CORRECTIVE ACTION.

5.1. If Owner determines that Contractor is in default by not cooperating or coordinating its Work properly with its subcontractors, not supplying sufficient skilled workers, not cleaning up the Project, not furnishing the necessary materials, equipment, or any temporary services or facilities to perform the Work in strict conformance with the Contract Documents, or Contractor is not on schedule, or is not otherwise performing its obligations under the Contract Documents, CONTRACTOR MUST WITHIN TWO (2) BUSINESS DAYS AFTER NOTICE OF SUCH DETERMINATION, (1) COMMENCE SUCH ACTION AS IS NECESSARY TO CORRECT THE DEFICIENCIES NOTED BY OWNER, (2) PROCEED TO CORRECT SUCH DEFICIENCIES WITHIN FIFTEEN (15) DAYS OF SUCH NOTICE OR, (3) IF OWNER INSTRUCTS CONTRACTOR TO TAKE URGENT CORRECTIVE ACTION TO PROTECT PERSONS OR PROPERTY, IMMEDIATELY TAKE SUCH CORRECTIVE ACTION, including but not limited to increasing the number of skilled workers, providing temporary services or facilities, and cleaning up the Project. Such corrective action shall be taken and continued without interruption and without waiting to initiate any dispute under this Agreement or the resolution of any dispute initiated under this Agreement. Failure to comply with this provision shall be an additional default.

6. COMPENSATION.

6.1. Contract Sum. The Contract Sum to be paid by Owner to Contractor, as provided herein, for the satisfactory performance and completion of the Work and all of the duties, obligations and responsibilities of Contractor under this Agreement and the other Contract Documents is $_____. The Contract Sum includes the following:

6.1.1. Base Bid Amount: $_____(Lump Sum Bid); and

6.1.2. [Not Used]

6.1.3. [Not Used]

6.1.4. [Not Used]

6.2. The Contract Sum includes all federal, state, county, municipal, and other taxes imposed by law, including but not limited to any sales, use, and personal property taxes payable by or levied against Contractor on account of the Work or the materials incorporated into the Work. Contractor is responsible to pay any such taxes.

6.3. The Contract Sum includes fees and costs for any required building permit as well as other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time negotiations are concluded. Contractor is responsible to secure any such permits, fees, licenses, and inspections.

6.4. Liquidated Damages.

6.4.1. Contractor must achieve Substantial Completion by the date stated in Section 4.1. By entering into this Agreement, Contractor agrees that the period for performing the Work is reasonable and that Contractor can achieve Substantial Completion by the date stated in this Agreement.

6.4.2. If Contractor does not achieve Substantial Completion of its Work on the Project by the Date for Substantial Completion stated in Section 4.1, Contractor shall pay the Owner (and the Owner may set off from sums coming due Contractor) liquidated damages in the per diem amount stated in the following chart for each calendar day beyond the Date for Substantial Completion, as may be modified in accordance with the Contract Documents, that the Contractor fails to achieve Substantial Completion.

Contract Sum Amount	**Dollars Per Day**
$0.01 to $50,000.00	$100.00
$50,000.01 to $150,000.00	$200.00
$150,000.01 to $500,000.00	$300.00
$500,000.01 to $750,000.00	$400.00
$750,000.01 to $1,000,000.00	$500.00
$1,000,000.01 to $2,000,000.00	$700.00
More than $2,000,000.01	$1,000.00

6.4.3. Contractor acknowledges by signing this Agreement with Owner that the amount of liquidated damages represent a reasonable estimate of the actual damages Owner would incur if the Work is not substantially complete by the foregoing date and that the damages that may result from the failure to substantially complete the work by the foregoing date are uncertain and difficult to ascertain. No waiver of consequential damages shall preclude the Owner from recovering liquidated damages.

6.4.4. Nothing in this Section 6.4 shall preclude the Owner from recovering its actual damages from the Contractor for third-party claims against the Owner or damages not associated with delay.

7. PAYMENT AND RETAINAGE.

7.1. Payment.

7.1.1. Applications for Payment. Payment applications shall be submitted on a monthly basis and shall reflect the amount of Work completed as of the date the application for payment is submitted consistent with the schedule of values. Payment applications must be received by the Owner not later than the fifteenth (15th) day of the month; payment applications received after the 15th day of the month will be deemed to be received in the following month and will be held for payment during the following payment period. With each application for payment the Contractor shall submit one copy of the following documentation:

(a) Invoice for Work performed and materials and equipment provided for the previous pay period;

(b) If required for the Project, the Certified Payroll Report for payment of prevailing wages;

(c) Lien waivers from itself and all subcontractors, suppliers, and any other party that performed Work or supplied materials for the Project in a form acceptable to the Owner for the Work performed during the current billing period; and

(d) Such other supplemental information as the Owner may require. Such other information may include a schedule of all materials and equipment stored on site.

7.1.2. Owner may withhold payment in whole or in part, and may demand that Contractor refund amounts previously paid, to protect Owner from loss because of:

(a) Contractor's default or failure to perform any of its obligations under the Contract Documents, including but not limited to: failure to provide sufficient skilled workers; Work, including equipment or materials, which is defective or otherwise does not conform to the Contract Documents; failure to conform to the Contract Time or Construction Schedule; and failure to follow the directions of or instructions from Owner;

(b) Contractor's default or failure to perform any of its obligations under another contract that it has with Owner;

(c) The filing of third-party claims, or reasonable evidence that third party claims have been or will be filed;

(d) The Work has not proceeded to the extent set forth in the application for payment;

(e) Any representations made by Contractor are untrue;

(f) The failure of Contractor to make payments to its Subcontractors;

(g) Damage to Owner's property or the property of another person or laborer;

(h) The determination that there is a substantial possibility that the Work cannot be completed for the unpaid balance of the Contract Sum; and/or

(i) Liens filed or reasonable evidence indicating the probable filing of such liens.

7.1.3. Owner will pay Contractor within thirty (30) days after receipt of the Contractor's payment application, provided that the payment application has been properly submitted on a timely basis and is accompanied by all of the required documentation. Amounts unpaid after thirty (30) days after Owner's receipt of the payment application shall bear interest at the rate of zero percent (0%).

7.2. Retainage.

7.2.1. Amount of Retainage.

7.2.1.1. Payments for Labor. Payments for labor incorporated into the Work will be at the rate of 92% of the amount set forth in Contractor's payment application and approved by Owner until the Work is 50% complete, unless the parties agree otherwise. When the Work is 50% complete, the payment for labor incorporated into the Work will be at the rate of 100% of the amount set forth in Contractor's payment application and approved by Owner.

7.2.1.2. Payments for Materials and Equipment. Payments for materials and equipment will be at the rate of 92% of the invoice cost of materials and equipment delivered to the Project site or other storage site approved by Owner. The balance of the invoice cost will be payable when the materials or equipment are incorporated into the Work. Incorporated into the Work means such materials and equipment are installed and conform to the requirements of the Contract Documents. When payment is made on account of materials or equipment not yet incorporated into the Project, such materials and equipment will become the property of Owner; provided that if such materials or equipment are stolen, destroyed, or damaged before being fully incorporated into the Project, Contractor shall be required to replace them at its expense.

7.2.2. Interest on Retainage.

7.2.2.1. Contractor agrees that Owner may hold retained amounts in the project construction fund and is not required to deposit the retained funds into a separate interest-bearing savings account. The balance of the retained funds, plus interest, will be paid to Contractor as its final payment for the Project, less any amounts needed to cover damages or costs incurred by Owner related to the Work.

7.2.2.2. In Lieu of the provisions of Section 7.2.2.1, the Contractor may request to have the Owner instead deposit the retained funds, when the Work is 50% complete, into a separate escrow account governed by an escrow agreement, employing an escrow agent, by providing written notice to the Owner of the request prior to the submission of the first pay application. If the Contractor so requests, the Contractor will be responsible for all expenses associated with the escrow agent and escrow account beyond the interest income from the account, and the change and expense must be expressly documented in a change to the contract. If the Contractor does not request an escrow account prior to submission of the first pay application, the Contractor will be deemed to have waived its rights under ORC 153.63 to have the retained funds so deposited and governed by an escrow agreement.

7.2.3. Documentation. Upon request, Contractor immediately will supply Owner with requested information so as to verify the amounts due to Contractor, including but not limited to original invoices for materials and equipment and documents showing that Contractor has paid for such materials and equipment, and so as to verify that amounts due laborers, subcontractors, and materialmen have been paid to them.

7.3. Final Payment.

7.3.1. The final application for payment shall be itemized and submitted after completion of the Work specified for the Project. Contractor shall ensure that the final application for payment shall contain one (1) copy of each of the following documents, if not previously delivered to Owner.

(a) All items required in Section 7.1.1;

(b) Contractor's Certificate of Insurance;

(c) Contractor's Workers' Compensation Certificate;

(d) Consent of Contractor's Surety to Payment;

(e) An assignment to Owner of all warranties obtained or obtainable by Contractor from manufacturers and suppliers of equipment and materials incorporated into the Work by written instrument of assignment in a form acceptable to Owner; and

(f) Such other documentation as required by the Contract Documents, Owner, or applicable law, including but not limited to, the final certified payroll report and required Affidavit of Compliance if Prevailing Wages are required for the Project.

7.3.2. The making of Final Payment by Owner does not constitute a waiver of Claims by Owner for the following:

(a) Liens, Claims, security interests, or encumbrances arising out of the Contract Documents that are unsettled;

(b) Failure of the Work to comply with the requirements of the Contract Documents;

(c) Terms of warranties required by the Contract Documents;

(d) Claims for Indemnification;

(e) Claims about which Owner has given Contractor notice; or

(f) Claims arising after Final Payment.

8. CHANGES IN THE WORK.

8.1. Change Orders.

8.1.1. A Change Order is a written instrument signed by Owner and Contractor stating their agreement upon a change in the Work, the amount of the adjustment or the method for computing the amount of the adjustment of the Contract Sum, if any, and the extent of the adjustment in the Contract Time, if any.

8.1.2. All Change Orders shall be submitted with any supporting documentation requested by the Owner in advance of the performance of the Work that is the subject of the Change Order and must be approved by the Owner in writing in advance of the performance of the Work that is the subject of the Change Order.

8.1.3. The agreement on any Change Order shall constitute a final settlement of all matters relating to the change in the Work that is the subject of the Change Order, including but limited to all direct, indirect, and cumulative costs that include reasonable overhead and profit associated with such change and any and all adjustments to the Contract Sum and in the Contract Time. Total cumulative overhead and profit for Contractor and all Subcontractors on any add or deduct Change Order shall not exceed 15% of the total cost of labor and material. The Contractor shall not proceed with any change in the Work without a signed Change Order. The Contractor's failure to timely seek and obtain such authorization as specified herein, shall constitute an irrevocable waiver by the Contractor of an adjustment to the Contract Sum or the Contract Time for the related work.

8.2. Construction Change Directives.

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

8.2.2. A Construction Change Directive shall be used in the absence of total agreement of a Change Order.

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

8.2.4. When the Owner and Contractor agree with adjustments in the Contract Sum and Contract Time, such agreement shall be effective immediately, and the Owner will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

8.2.5. If the Contractor disagrees with the adjustment in the Contract Time or the Contract Sum, the Contractor may make a Claim in accordance with applicable provisions of Article 9.

9. CLAIMS AND DISPUTES.

9.1. A Claim is a demand or assertion by one of the parties seeking, as a matter of right, adjustment, or interpretation of the terms of the Contract Documents, payment of money, extension of time, or other relief with respect to the terms of the Contract Documents, provided that Owner's decision to adjust or withhold payment under Section 7.1.2 will not be considered a Claim. The responsibility to substantiate claims shall

rest with the party making the Claim. Contractor will not knowingly (as “knowingly” is defined in the federal False Claims Act, 31 U.S.C. Section 3729, *et seq*.) present or cause to be presented a false or fraudulent Claim. As a condition precedent to making a claim, Contractor must submit an affidavit sworn to before a notary public or other person authorized to administer oaths in the State of Ohio and executed by an authorized representative of Contractor, which states that:

> The Claim submitted herewith complies with Section 9.1 of the Owner-Contractor Agreement, which provides that “Contractor will not knowingly present or cause to be presented a false or fraudulent Claim.”

9.2. Subject to the requirements of Article 9, if Contractor wishes to make a Claim for an increase in the Contract Sum, written notice must be given before proceeding to execute the Work.

9.3. Subject to the requirements of Article 9, if Contractor wishes to make a Claim for additional time, the required written notice must include an estimate of cost and probable effect of delay on progress of the Work. In the event of continuing delay, only one Claim is necessary. If adverse weather conditions are the basis for a Claim for additional time, such claim must be documented by data substantiating that weather conditions were abnormal for the period of time and could not have been reasonably anticipated, and that weather conditions had an adverse effect on the scheduled construction.

9.3.1. The delays for which the Contractor is entitled to additional time are "Excusable Delays." The only Excusable Delays are those delays on the critical path which the Contractor establishes were: (a) caused by the Owner or those in privity of contract with the Owner, (b) physical damage to the Project over which the Contractor has no control, (c) labor disputes beyond the control of the Contractor, (d) work days lost due to weather conditions as provided under Section 4.4.1, (e) concealed or unknown conditions under Section 9.4, and (f) other unforeseeable delays beyond the control of the Contractor and its subcontractors and suppliers of any tier. The delays for which the Contractor is entitled to additional time and money are "Compensable Delays." The only Compensable Delays are those Excusable Delays which the Contractor establishes were proximately caused by an improper action or failure to act by the Owner. Owner, in its sole and reasonable discretion, shall determine whether a delay entitles Contractor to time extension or additional compensation.

9.4. If conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, then the Contractor shall give written notice to the Owner and the Design Professional, if any, promptly before conditions are disturbed and in no event later than forty-eight (48) hours after first observance of the conditions. If the conditions are materially different and cause an increase or decrease in the Contractor’s cost of, or time required for, performance of any part of the Work, Owner will issue an appropriate Change Order.

9.5. Contractor must make all claims by written affidavit per Article 9 within seven (7) days after the occurrence of the event giving rise to the Claim. Proper notice of delay as required under Section 4.4.1 is a condition precedent to entitlement of a Claim. Failure to do so results in an irrevocable waiver of the Claim.

9.6. Within ten (10) days of its receipt of a written request, Contractor must make available to Owner or its representative any books, records, or other documents in its possession or to which it has access relating to any Claim and must require its Subcontractors, regardless of tier, and materialmen to do likewise.

9.7. If a Contractor’s Claim has not been resolved at the time of Substantial Completion, the Contractor’s exclusive remedy is to file suit in the Common Pleas Court for the county in which the Project is located within 90 days of Substantial Completion, unless the parties otherwise agree in writing, else such Claim is waived. Each party waives its right to remove any such suit to federal court.

9.8. Unless otherwise agreed in writing, Contractor shall continue its Work on the Project and shall maintain progress during any mediation, arbitration, or litigation proceedings, and the Owner shall continue to make payments to the Contractor in accordance with this Agreement, however, the Owner shall be under no obligation to make payments on or against any claim or amounts in dispute during the pendency of any mediation, arbitration, or litigation proceeding to resolve those claims or amounts in dispute.

9.9. Settlement Offers. If the Contractor initiates a claim, the Owner may make settlement offers to settle the Claim at any time up to the date of trial. Such settlement offers shall be subject to Rule 408 (Compromise and Offers of Compromise) of the Ohio Rules of Evidence. If at any stage of the litigation, including any appeals,

the Contractor's Claim is dismissed or found to be without merit, or if the damages awarded to the Contractor on its Claim do not exceed the Owner's last settlement offer, the Contractor shall be liable to the Owner and shall reimburse the Owner for all the Owner's attorneys' fees and expenses, and arising out of or related to such Claim since the date of such last settlement offer.

9.10. Waiver of Claims for Consequential Damages. The Contractor waives Claims against the Owner for consequential damages arising out of or relating to this Contract. This waiver includes damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit except anticipated profit arising directly from the Work. This waiver is applicable, without limitation, to all consequential damages due to the Owner's termination of the Agreement in accordance with this Agreement.

10. DEFAULT OF CONTRACTOR.

10.1. Events of Default. Each of the following constitutes an event of default of Contractor:

10.1.1. Contractor's failure to perform any of its obligations under the Contract Documents or failure to proceed to commence to correct such failure in accordance with Section 5.1.

10.1.2. Contractor's failure to pay its obligations incurred in connection with this Agreement as they become due or Contractor's insolvency.

10.2. Owner's Remedies. Upon the occurrence of an event of default, Owner has the following remedies, which are cumulative:

10.2.1. Order Contractor to stop the Work, which Contractor must do immediately;

10.2.2. To perform through others all or any part of the Work remaining to be done and to deduct the cost thereof from the unpaid balance of the Contract Sum or, if the unpaid balance of the Contract Sum is inadequate, to demand reimbursement of amounts previously paid to Contractor;

10.2.3. To terminate this Agreement and take possession of, for the purpose of completing the Work or any part of it, all materials, equipment, scaffolds, tools, appliances, and other items belonging to or possessed by Contractor, all of which Contractor hereby transfers and assigns to Owner for such purpose, and to employ any person or persons to complete the Work, including Contractor's employees, and Contractor will not be entitled to receive any further payment until the Work is completed;

10.2.4. To accept assignment of Contractor's subcontracts for the Project, pursuant to any prior rights of the surety, if any, and, at the Owners' sole discretion, to further assign the subcontracts to a successor contractor or other entity provided that (i) the Owner terminates this Agreement for cause, and (ii) provides written notice of such assignment to both Contractor and Subcontractor; and/or,

10.2.5. All other remedies that Owner may have at law or in equity or otherwise under the Contract Documents.

10.3. Termination of Agreement. The termination of this Agreement will be without prejudice to Owner's rights and remedies, including without limitation Owner's right to be indemnified by Contractor.

10.4. Payments Due Contractor. If the unpaid balance of the Contract Sum exceeds the cost of finishing the Project, including any costs, expenses, or damages incurred by Owner as a result of the event of default, including attorneys' and consultants' fees and the administrative expense of Owner's staff, such excess shall be paid to Contractor. If such costs exceed the unpaid balance, Contractor is responsible to pay the difference to Owner. The obligations under this section will survive termination of this Agreement.

11. DEFAULT OF OWNER.

11.1.1. Events of Default. The following constitutes the exclusive events of default of Owner:

11.1.1.1. Failure of Owner to perform any express material obligation under the Contract Documents and to correct such failure within thirty (30) days after receipt of written notice thereof from Contractor specifying the default and the necessary corrective action.

11.2. Contractor's Remedy.

11.2.1. Contractor's sole and exclusive remedy for the default of Owner shall be to follow the procedure set forth in Article 9.

11.2.2. Notwithstanding Section 11.2.1, if Owner fails to pay Contractor undisputed amounts as payment becomes due, Contractor may, upon fifteen (15) days written notice, stop the Work until payment of the undisputed amount owing has been received.

12. SUSPENSION OR TERMINATION FOR THE CONVENIENCE OF OWNER.

12.1. Suspension for the Convenience of Owner.

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

12.1.2. An equitable adjustment will be made for increases in the Contract Time and cost of performance of the Work, including profit and overhead on the increased cost of performance, caused by the suspension, delay or interruption, provided that the total cost of profit and overhead shall not exceed ten percent (10%) of the amount of the increased cost not attributable to profit or overhead. No adjustment will be made to the extent that:

(a) performance is, was or would have been so suspended, delayed, or interrupted by another cause for which Contractor is responsible; or

(b) an equitable adjustment is made or denied under another provision of this Agreement for a concurrent event.

12.2. Termination for the Convenience of Owner.

12.2.1. Owner may, in its discretion and without cause, upon three (3) business days' written notice to Contractor terminate this Agreement for Owner's convenience.

12.2.2. Upon receipt of a written notice from Owner terminating this Agreement for the Owner's convenience and without cause, the Contractor will (i) immediately cease performing any or all portions of the Work, unless otherwise directed by the Owner, in which case the Contractor will take the action directed by the Owner, (ii) immediately take all reasonable and necessary action to protect and preserve the Work, and (iii) unless otherwise directed by Owner, terminate or assign all agreements with Subcontractors and suppliers.

12.2.3. If this Agreement is terminated for the Owner's convenience and there exists no event of Contractor's default, as defined in this Agreement, the Contractor shall be entitled to receive payment (i) for Work properly executed up to the date the notice of termination is received by Contractor, including overhead and profit up to the date of termination, and (ii) for Work performed at the direction of the Owner on and after the date on which the notice of termination is received by the Contractor, as determined by the procedures applicable to Change Orders.

12.2.4. If this Agreement is terminated for the Owner's convenience and there exists an event of Contractor's default, as defined in this Agreement, Contractor will be entitled to receive only such sums as it would be entitled to receive following the occurrence of an event of default under this Agreement.

12.2.5. The termination of this Agreement will be without prejudice to any rights or remedies that exist at the time of termination.

13. INSURANCE, INDEMNIFICATION, AND BOND.

13.1. Contractor must maintain commercial general liability insurance in the minimum amount of $1,000,000.00 per incident and $2,000,000.00 aggregate, worker's compensation coverage as required by the Ohio Revised Code, automobile liability coverage in the minimum amount of $1,000,000.00 per accident and $2,000,000 aggregate, and an umbrella policy in the minimum amount of $5,000,000.00, unless Owner approves other coverage limits in writing. Excess or umbrella coverage may be used to meet these levels of insurance. The Owner shall be named as an additional insured on the Contractor's insurance policies. The Contractor shall provide a certificate of insurance showing the required coverages, with the Owner named as a certificate holder

and as an additional insured; Contractor also agrees to provide Owner with at least thirty (30) days' notice prior to any changes in coverage of the required insurance. The Contractor shall maintain all such coverage for a period of 3 years after the Date for Final Completion.

13.1.1. The Contractor shall maintain Contractors Errors & Omissions Liability Insurance insuring against errors and omissions arising from the Work if the Work involves any construction management or the preparation of plans and drawings, with limits of not less than $1,000,000.00 per claim. Such policy shall not contain any exclusions directed toward any types of materials, services or processes involved in the Work. The retroactive date for coverage will be no later than the commencement date of design and will state that in the event of cancellation or nonrenewal the discovery period for insurance claims will be at least three (3) years or otherwise as by written agreement with the Owner.

13.2. Insurance furnished by the Owner, if any, is not intended to and does not cover equipment and materials before they are physically incorporated into the Work or tools. Contractor bears the entire risk of loss with respect to tools, equipment, and materials. Contractor is responsible for damages to Owner's property and to adjacent property caused by or related to the Work or actions by Contractor's employees or those of its subcontractors.

13.3. The Contractor shall purchase and maintain, in a company or companies lawfully authorized to do business in the jurisdiction in which the Project is located, property insurance on an "all-risk" or equivalent policy form, including builder's risk, in the amount of the initial Contract Sum, plus the value of subsequent modifications and cost of materials supplied and installed by others, comprising total value for the entire Project at the site on a replacement cost basis without optional deductibles. Such property insurance shall be maintained, unless otherwise provided in the Contract Documents or otherwise agreed in writing by all persons and entities who are beneficiaries of such insurance, until final payment has been made as provided in Section 7.3 or until no person or entity other than the Owner has an insurable interest in the property required by this Section 13.3 to be covered, whichever is later. The insurance shall include interests of the Owner, the Contractor, Subcontractors, and Sub-subcontractors in the Project.

13.4. Owner and Contractor waive all rights, including all rights of subrogation, against each other and against Subcontractors, Sub-subcontractors, consultants, agents, and employees of the other for damages during construction, but only to the extent covered by (and not prohibited by) any applicable property insurance or builder's risk insurance, except such rights as they may have to the proceeds of such insurances.

13.5. To the maximum extent permitted by law, Contractor shall indemnify and hold harmless Owner and Owner's consultants, agents, and employees from and against all claims, damages, losses, and expenses, including but not limited to attorneys' and consultants' fees, arising out of or related to the performance of the Work, including but not limited to the failure of Contractor to perform its obligations under the Contract Documents, any claims for bodily injury, sickness, disease, or death or to injury to or destruction of or loss of use of real or personal property, claims for additional storage and handling charges, liens against funds, claims related to the alleged failure of the Contractor to perform in accordance with the Contract Documents, and/or claims related to the removal, handling, or use of any hazardous materials. Owner may withhold amounts equal to any sums for which it is entitled to be indemnified from the amounts otherwise due Contractor under the Contract Documents.

13.6. In claims against any person or entity indemnified under this Contract by an employee of Contractor, a Subcontractor, anyone directly or indirectly employed by them or anyone for whose acts they may be liable, the indemnification obligations under this Contract shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable for Contractor or Subcontractor under workers' compensation acts, disability benefits acts, or other employee benefits acts. Contractor expressly waives any protection or immunity with respect to Workers' Compensation claims related to indemnification given under this Agreement.

13.7. Contract Bond.

13.7.1. The Contractor shall provide a contract bond to guaranty payment and performance of the Work, as required by Ohio law. When the Contractor delivers the executed counterparts of the Agreement to the Owner, the Contractor shall deliver such bond to the Owner, along with other documents as may be required.

13.7.1.1. If the surety on any bond furnished by the Contractor is declared bankrupt or becomes insolvent or its right to do business is terminated in any state where any part of the Project is located or it ceases to meet the requirements of the Agreement or Ohio law, the Contractor shall promptly

notify the Owner and shall, within twenty (20) days after the event giving rise to such notification, provide another bond and surety, both of which shall comply with the requirements of the Contract Documents and Ohio law.

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

13.7.3. Material Default or Termination. If the Owner notifies the Contractor's surety that the Contractor is in material default or terminates the Contract, the surety will promptly and within twenty-one (21) days investigate the claimed material default or termination. If the Owner gives a notice of material default and then terminates the Contract, the surety shall complete its investigation within twenty-one (21) days of the notice of material default. As part of such investigation, the surety shall visit the offices of the Contractor and Owner to review the available project records. If the surety proposes to take over the Work, the surety shall do so no later than the expiration of the twenty-one (21) day period or ten (10) days after the date the Owner terminates the Contract, whichever is later. If the Owner terminates the Work, and the surety proposed to provide a replacement contractor, the replacement contractor shall be fully capable of performing the Work in accordance with the Contract Documents, including meeting all of the requirements of the Contract Documents. If the Contractor is terminated, the replacement contractor shall not be the Contractor. The surety will provide the Owner with the results of its investigation, including any written report or documents. This Section 13.7.3 is in addition to the Owner's rights under this Agreement to terminate the Contractor for cause and is not intended to create any rights of the surety, including but not limited to the right to take over the Contractor's obligations.

14. WARRANTIES. In addition to any other warranties, guarantees, or obligations set forth in the Contract Documents or applicable as a matter of law and not in limitation of the terms of the Contract Documents, Contractor warrants and guarantees that:

(a) Owner will have good title to the Work and all materials and equipment incorporated into the Work will be new;

(b) The Work and all materials and equipment incorporated into the Work will be free from all defects, including any defects in workmanship or materials;

(c) The Work and all equipment incorporated into the Work will be fit for the purpose for which intended;

(d) The Work and all materials and equipment incorporated into the Work will be merchantable; and,

(e) The Work and all materials and equipment incorporated into the Work will conform in all respects to the Contract Documents.

Upon notice of the breach of any of the foregoing warranties or guarantees or any other warranties or guarantees under the Contract Documents, Contractor, in addition to any other requirements in the Contract Documents, shall commence to correct such breach and all resulting damage within two (2) business days after written notice from the Owner. Contractor shall correct such breach and damage to the satisfaction of Owner within fifteen (15) days of such notice except when an extension of time is granted in writing by Owner; provided that if such notice is given after final payment hereunder, such 2-day period will be extended to seven (7) days and such 15-day period shall be extended to thirty (30) days. If Contractor fails to commence to correct such breach and damage, or to correct such breach and damage as provided above, Owner, upon written notice to Contractor and without prejudice to any of its other rights or remedies, may correct the deficiencies. Contractor upon written notice from Owner shall pay Owner, within ten (10) days after the date of such notice, all of Owner's costs and expenses incurred in connection with or related to such correction and/or breach, including without limitation Owner's administrative, legal, design, and consulting expenses. The foregoing warranties and obligations of Contractor will survive the final payment and/or termination of this Agreement. If the Contractor fails to pay the Owner any amounts due under this Article 14, Contractor will pay Owner, in addition to the amounts due, a late payment fee of one and one-half percent (1.5%) per month for each month or part thereof that the payments are not paid when due.

15. GENERAL.

15.1. Modification. No modification or waiver of any of the terms of this Agreement or of any other Contract Documents shall be effective against a party unless set forth in writing and signed by or on behalf of a party,

which in the case of Owner shall require the signature of Owner pursuant to a specific resolution of Owner. Under no circumstances will forbearance, including the failure or repeated failure to insist upon compliance with the terms of the Contract Documents, constitute the waiver or modification of any such terms. The parties acknowledge that no person has authority to modify this Agreement or the other Contract Documents or to waive any of its or their terms, except as expressly provided in this Paragraph.

15.2. Assignment. Contractor may not assign this Agreement without the written consent of Owner; which Owner may withhold in its sole discretion.

15.3. Third Parties. Nothing contained in this Agreement shall create a contractual relationship with or a cause of action in favor of a third party against either Owner or Contractor.

15.4. Law and Jurisdiction. All questions regarding the validity, intention, or meaning of this Agreement or any modifications of it relating to the rights and obligations of the parties shall be construed and resolved under the laws of the State of Ohio. Any suit, which may be brought to enforce any provision of this Agreement or any remedy with respect hereto, shall be brought in the Common Pleas Court for the county in which the Project is located, and each party hereby expressly consents to the jurisdiction of such court. Each party waives its right to remove any such suit to federal court.

15.5. Statute of Limitations. Regardless of any provision to the contrary, the statute of limitations with respect to any defective or non-conforming Work that is not discovered by Owner will not commence until the discovery of such defective or non-conforming Work by Owner.

15.6. Notices. Notices, requests, or demands by either party shall be in writing, unless otherwise expressly authorized, and shall be personally served; forwarded by expedited messenger service; sent by facsimile transmission; sent by electronic mail with delivery confirmation; or be given by registered or certified mail, return receipt requested, postage prepaid, and addressed to the party at the address set forth at the beginning of this Agreement. Any party may change its address by giving written notice hereunder. All notices, requests, and demands shall be deemed received upon receipt in the case of personal delivery or delivery by expedited messenger service, including leaving the notice at the address provided herein during normal business hours; upon the expiration of forty-eight (48) hours from the time of deposit in the United States mail; or, in the case of a notice given by electronic mail or facsimile transmission, upon the expiration of 24 hours after the transmission is sent.

15.7. Construction. The parties acknowledge that each party has reviewed this Agreement and the other Contract Documents and has voluntarily entered into this Agreement. Accordingly, the normal rule of construction to the effect that any ambiguities are to be resolved against the drafting party shall not be employed in the interpretation of this Agreement, the other Contract Documents, or any amendments or exhibits to it or them.

15.8. Approvals. Except as expressly provided herein, the approvals and determinations of Owner will be subject to the sole discretion of Owner and will be valid and binding on Contractor, provided only that they be made in good faith, *i.e.*, honestly. If Contractor challenges any such approval or determination, Contractor bears the burden of proving by clear and convincing evidence that it was not made in good faith.

15.9. Partial Invalidity. If any term or provision of this Agreement is found to be illegal, unenforceable, or in violation of any laws, statutes, ordinances, or regulations of any public authority having jurisdiction, then, notwithstanding such term or provision, this Agreement shall remain in full force and effect, and such term shall be deemed stricken; provided this Agreement shall be interpreted, when possible, so as to reflect the intentions of the parties as indicated by any such stricken term or provision.

15.10. Compliance with Laws and Regulations. Contractor, at its expense, must comply with all applicable federal, state, and local laws, rules, and regulations applicable to the Work, including but not limited to ORC Chapter 4115 regarding prevailing wage rates, if applicable.

15.11. Project Safety. Contractor must follow all applicable safety and health regulations during the progress of the Project and monitor all of its employees and its subcontractors for compliance with such safety and health regulations. In undertaking the responsibilities set forth in this section, Contractor does not assume any duty or responsibility to the employees of any Subcontractor or supplier, regardless of tier. Owner assumes no responsibility for the development, review, or implementation of any project safety plan or for Project safety and has no authority to direct the means and methods of Contractor.

15.12. Equal Opportunity. Contractor will not, and it will ensure that its Subcontractors, regardless of tier, do not, discriminate against any employee or applicant for employment because of race, religion, color, sex, or national origin. Such action includes but is not limited to the following: employment, upgrading, demotion, transfer, recruitment or recruiting advertising, layoff or termination, rates of pay or other forms of compensation, and selection for training, including apprenticeship. Contractor agrees to post in conspicuous places, available to employees and applicants for employment, notices setting forth the policies of nondiscrimination. Contractor is responsible to ensure that each of its Subcontractors, regardless of tier, states in all solicitations or advertisements for employees placed by them or on their behalf that all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, or national origin No Findings for Recovery.

15.13. No Findings for Recovery. The Contractor represents that the Contractor is not subject to a finding for recovery under Section 9.24, Ohio Revised Code, or that the Contractor has taken the appropriate remedial steps required under Section 9.24, Ohio Revised Code, or otherwise qualifies under this section. If this representation and warranty is found to be false, the Contract is void, and Contractor will immediately repay Owner any funds paid to Contractor under this Contract.

15.14. Non-Discrimination. Contractor agrees:

(a) That in the hiring of employees for the performance of Work under this Agreement or in any subcontract, neither the Contractor, subcontractor, nor any person acting on behalf of either of them, shall by reason of race, creed, sex, handicap, or color, discriminate against any citizen of the state in the employment of labor or workers who are qualified and available to perform the Work to which the employment relates.

(b) That neither the Contractor, subcontractor, nor any person acting on behalf of either of them, shall, in any manner, discriminate against or intimidate any employee hired for the performance of Work under this Agreement on account of race, creed, sex, handicap, or color.

(c) That there shall be deducted from the amount payable to the Contractor by the Owner under this Agreement a forfeiture of twenty-five dollars ($25.00) as required by Ohio Revised Code Section 153.60 for each person who is discriminated against or intimidated in violation of this Agreement.

(d) That this Agreement may be canceled or terminated by the Owner and all money to become due hereunder may be forfeited for a second or subsequent violation of the terms of this section of this Agreement.

15.15. Use of Owner's Facilities. Contractor will ensure that neither its employees, nor its Subcontractor's or material supplier's employees, regardless of tier, do any of the following without the express prior written consent of Owner:

(a) use Owner's facilities including but not limited to, common areas, rest rooms, or phones;

(b) use or bring any alcoholic beverages, controlled substances, or firearms on any property owned by Owner;

(c) use any radios, tape or compact disc players, or sound amplification equipment; and

(d) interact in any manner with building occupants, except where necessary to preserve the safety of building occupants.

Contractor must conspicuously post notice of the prohibitions listed in this section at the Project site in the same location as OSHA notices are required to be posted and shall verbally inform all of Contractor's employees, and the employees of Contractor's Subcontractors and materialmen, regardless of tier, of such prohibitions. The notice must be in a form acceptable to Owner.

15.16. Entire Agreement. This Agreement and the other Contract Documents constitute the entire agreement among the parties with respect to their subject matter and will supersede all prior and contemporaneous, oral or written, agreements, negotiations, communications, representations, and understandings with respect to such subject matter, and no person is justified in relying on such agreements, negotiations, communications, representations, or understandings.

15.17. Attachments. Attachments to this Agreement include:

Exhibit A: Contract Bond

Exhibit B: Sales and Use Tax Construction Contract Exemption Certificate

Exhibit C: Prevailing Wage Rates

However, in the event of an inconsistency, the provisions of this Agreement control over any proposal, document, or other attachment.

IN WITNESS WHEREOF, the parties have caused this Agreement to be executed by their properly authorized representatives.

Owner: **Pickerington Public Library Board of Trustees**	**Contractor:**
_____ *Signature*	_____ *Signature*
By: _____ *Printed Name and Title*	By: _____ *Printed Name and Title*
Date: _____	Date: _____

CERTIFICATE OF FUNDS
(ORC Section 5705.41)

The undersigned, Fiscal Officer of the Owner, hereby certifies in connection with the Agreement to which this Certificate is attached that the amount required to meet the obligations under the contract, obligation, or expenditure for the services described in the attached agreement, has been lawfully appropriated for the purpose, and is in the treasury or in process of collection to the credit of an appropriate fund, free from any outstanding obligation or encumbrance.

Dated: _____

_____
Fiscal Officer

CONTRACTOR'S PERSONAL PROPERTY TAX AFFIDAVIT
(ORC § 5719.042)

State of Ohio
County of _____, ss:

_____, being first duly sworn, deposes and says that he is the
(Name)

_____of _____, with offices located at
(Title) (Contractor)

_____, and as its duly
(Address of Contractor)

authorized representative, states that effective this _____day of _____, 2022,

_____
(Name of Contractor)

( ) is charged with delinquent personal property taxes on the general list of personal property as set forth below:

County	Amount (include total amount penalties and interest thereon)
_____County	$_____
_____County	$_____
_____County	$_____

( ) is not charged with delinquent personal property taxes on the general list of personal property in any Ohio county.

_____
(Affiant)

Sworn to and subscribed this _____day of _____, 2022.

The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

_____
(Notary Public)

My commission expires

_____, 2022

BID GUARANTY AND CONTRACT BOND

(O.R.C. § 153.571)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned _____("Contractor") as principal and _____as surety are hereby held and firmly bound unto the Pickerington Public Library Board of Trustees, as obligee in the penal sum of the dollar amount of the bid submitted by the principal to the obligee on _____, 20__, to undertake the construction of the _____("Project"). The penal sum referred to herein shall be the dollar amount of the principal's bid to the obligee, incorporating any additive or deductive Alternates 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 foregoing blank is not filled in, the penal sum will be the full amount of the principal's bid, including add Alternates. Alternatively, if the blank is filled in the amount stated must not be less than the full amount of the bid including add 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.

Signed this _____day of _____, 20__.

THE CONDITION OF THE ABOVE OBLIGATION IS SUCH that whereas the above-named principal has submitted a bid for work on the 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, details, specifications, and bills of material; and in the event the principal pays to the obligee the difference not to exceed ten percent (10%) of the penalty hereof between the amount specified in the bid and such larger amount for which the obligee may in good faith contract with the next lowest bidder to perform the work covered by the bid; or in the event the obligee does not award the contract to the next lowest bidder and resubmits the project for bidding, the principal pays to the obligee the difference not-to-exceed ten percent (10%) of the penalty 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 ten (10) days after the awarding of the contract enters into a proper contract in accordance with the bid, plans, details, specifications, and bills of material, which said contract is made a part of this bond the same as though set forth herein.

Now also, if the said principal shall well and faithfully do and perform the things agreed by said principal to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, 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 materialman 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; and surety shall indemnify the obligee against all damage suffered by failure of the principal to perform the contract according to its provisions and in accordance with the plans, details, specifications, and bills of material therefor and to pay all lawful claims of subcontractors, materialmen, and laborers for labor performed or material furnished in carrying forward, performing, or completing the contract and surety further agrees and assents that this undertaking is for the benefit of any subcontractor, materialman, or laborer having a just claim, as well as for the obligee; 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 the said contract or in or to the plans or specifications therefore shall in any wise affect the obligations of said surety on its bond, and does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

Signed and sealed this _____day of _____, 20__.

_____
PRINCIPAL

By: _____

Printed Name & Title: _____

_____
SURETY

By: _____

Printed Name & Title: _____

_____

Surety's Address: _____

_____

Surety's Telephone Number: _____

Surety's Fax Number: _____

_____
SURETY'S AGENT

Surety's Agent's Address: _____

_____

Surety's Agent's Telephone Number: _____

Surety's Agent's Fax Number: _____

NOTE: The Contract Bond form that follows is to be used ONLY by a bidder that is awarded a contract and submits a form of bid guaranty other than the combined Bid Guaranty and Contract Bond with its bid. If a bidder submits a combined Bid Guaranty and Contract Bond, then the bid guaranty becomes the contract bond when the contract is awarded.

AIA Bid Bond or Payment and Performance Bond forms are not acceptable for this Project.

CONTRACT BOND
(O.R.C. § 153.57)

KNOW ALL PERSONS BY THESE PRESENTS, that we, the undersigned ("Contractor"), as principal, and _____, as surety, are hereby held and firmly bound unto the Pickerington Public Library Board of Trustees ("Owner") as obligee, in the penal sum of _____Dollars ($_____), for the payment of which 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 did on the _____day of _____, 20_____, enter into a contract with the Owner for construction of the _____("Project"), which said contract is made a part of this bond the same as though set forth herein:

Now, if the said Contractor shall well and faithfully do and perform the things agreed by the Contractor to be done and performed according to the terms of said contract; and shall pay all lawful claims of subcontractors, materialmen, 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 materialman 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 the said contract or in or to the plans or specifications therefore shall in any wise affect the obligations of said surety on its bond, and does hereby waive notice of any such modifications, omissions or additions to the terms of the contract or to the work or to the specifications.

Signed and sealed this _____day of _____, 20__.

_____
(PRINCIPAL)

By: _____

Printed Name & Title: _____

_____

_____
(SURETY)

By: _____

Printed Name & Title: _____

_____

Surety's Address: _____

_____

_____

Surety's Telephone Number: _____

Surety's Fax Number: _____

_____
NAME OF SURETY'S AGENT

Surety's Agent's Address: _____

_____

_____

Surety's Agent's Telephone Number: _____

Surety's Agent's Fax Number: _____

Ohio | Department of Taxation
tax.ohio.gov

Reset Form

STEC CC
Rev. 11/14

Sales and Use Tax
Construction Contract Exemption Certificate

Identification of Contract:

Contractee's (owner's) name: Pickerington Public Library Board of Trustees

Exact location of job/project: 201 Opportunity Way, Pickerington, Ohio 43147

Name of job/project as it appears on contract documentation: Pickerington Public Library Main Library Remodel

The undersigned hereby certifies that the tangible personal property purchased under this exemption certificate was purchased for incorporation into:

☐	A building used exclusively for charitable purposes by a nonprofit organization operated exclusively for charitable purposes as defined in Ohio Revised Code (R.C.) section 5739.02(B)(12);	☑	Real property that is owned, or will be accepted for ownership at the time of completion, by the United States government, its agencies, the state of Ohio or an Ohio political subdivision;
☑	Real property under a construction contract with the United States government, its agencies, the state of Ohio or an Ohio political subdivision;	☐	A computer data center entitled to exemption under R.C. 122.175;
☐	A horticulture structure or livestock structure for a person engaged in the business of horticulture or producing livestock;	☐	A building under a construction contract with an organization exempt from taxation under section 501(c)(3) of the Internal Revenue Code of 1986 when the building is to be used exclusively for the organization's exempt purposes;
☐	A house of public worship or religious education;		
☐	The original construction of a sports facility under R.C. section 307.696;	☐	A hospital facility entitled to exemption under R.C. section 140.08;
☐	Real property outside this state if such materials and services, when sold to a construction contractor in the state in which the real property is located for incorporation into real property in that state, would be exempt from a tax on sales levied by that state;	☐	Building and construction materials and services sold for incorporation into real property comprising a convention center that qualifies for property tax exemption under R.C. 5709.084 (until one calendar year after the construction is completed).

The original of this certificate must be signed by the owner/contractee and/or government official and must be retained by the prime contractor. Copies must be maintained by the owner/contractee and all subcontractors. When copies are issued to suppliers when purchasing materials, each copy must be signed by the contractor or subcontractor making the purchase.

Prime Contractor

Name _____

Signed by _____

Title _____

Street address _____

City, state, ZIP code _____

Date _____

Subcontractor

Name _____

Signed by _____

Owner/Contractee

Name Pickerington Public Library Board of Trustees

Signed by _____

Title Brenda Oliver, Fiscal Officer

Street address 201 Opportunity Way

City, state, ZIP code Pickerington, Ohio 43147

Title _____

Street address _____ City,

state, ZIP code _____ Date

_____

Date _____

Political Subdivision

Name _____ Signed by _____ Title __ Street address _ City, state, ZIP code __ Date

STATEMENT OF CLAIM FORM

Claim No. ___for Contractor

1. Name of Contractor: _____

2. Date written claim given:_____

3. Contractor's representative to contact regarding the claim:

   Name:_____ Title: _____
   Telephone No. _____(office) FAX No. _____

   E-mail: _____

4. General description of claim:

_____
_____
_____

5. Contract Documents. If the claim is based upon any part or provision in the Contract Documents, including but not limited to pages in the Drawings and/or paragraphs in the Specifications, Owner-Contractor Agreement, General Conditions or Supplementary General Conditions, state upon which parts or provisions the claim is based:

_____
_____
_____

6. Delay claims:
   6.1 Date delay commenced: _____
   6.2 Duration or expected duration of the delay, if known: _____
   6.3 Apparent cause of the delay and part of critical path affected:

_____
_____
_____

   6.4 Expected impact of the delay and recommendations for minimizing such impact:

_____
_____
_____

7. Additional compensation. Set forth in detail all additional compensation to which the Contractor believes it is entitled with respect to this claim:

_____
_____
_____

8. Instructions for Completing the Statement of Claim Form ("Instructions"). The Instructions are incorporated in this Form.

9. Truth of Claim. By submitting this claim, the Contractor and its representative certify that after conscientious and thorough review and to the best of his or her knowledge and belief a) the Contractor has complied fully with the Instructions, b) the information in this State of Claim is accurate, c) the Contractor is entitled to recover the compensation in paragraph 7, and d) the Contractor has not knowingly presented a false or fraudulent claim. The Contractor by its authorized representative must acknowledge this Statement of Claim before a notary public.

CONTRACTOR: _____

By: _____

Name and Title:_____

Date: _____

CONTRACTOR'S ACKNOWLEDGMENT

State of _____,

County of _____, ss:

_____ first being sworn, states that after conscientious and thorough review, the statements made in attached Statement of Claim Form are complete and true to the best of his or her knowledge and belief.

_____

Sworn to before me a notary public by _____on _____, 20__. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

_____
Notary Public

WHEN COMPLETED, FORWARD A COPY OF THIS NOTICE AND STATEMENT OF CLAIM FORM TO THE OWNER AND DESIGN PROFESSIONAL.

INSTRUCTIONS FOR COMPLETING THE STATEMENT OF CLAIM FORM

1. Completing the Statement of Claim Form ("Claim Form") is a material term of the Contract. The Claim Form tells the Owner and Design Professional that the Contractor is making a Claim and that they need to act promptly to mitigate the effects of the occurrence giving rise to the Claim. The Claim Form also provides them with information so that they can mitigate such effects. The Contractor acknowledges that constructive knowledge of the conditions giving rise to the Claim through job meetings, correspondence, site observations, etc. is inadequate notice, because knowledge of these conditions does not tell the Owner and Design Professional that the Contractor will be making a Claim and most often is incomplete.

2. If the space provided in the Claim Form is insufficient, the Contractor, as necessary to provide complete and detailed information, must attach pages to the Claim Form with the required information.

3. Paragraph 4. The Contractor must state what it wants, *i.e.*, time and/or compensation, and the reason why it is entitled to time and/or compensation.

4. Paragraph 5. The Contractor must identify the exact provisions of the Contract Documents it is relying on in making its Claim. For example, if the Claim is for a change in the scope of the Contractor's Work, the Contractor must identify the specific provisions of the Specifications, and the Plan sheets and details that provide the basis for the scope change.

5. Paragraph 6. This paragraph applies to delay claims, including delays that the Contractor believes result in constructive acceleration. The Contractor must identify the cause of the delay, party or parties responsible, and what the party did or did not do that caused the delay, *i.e.*, specific work activities. The Contractor acknowledges that general statements are not sufficient, and do not provide the Owner with sufficient information to exercise the remedies available to the Owner or to mitigate the effects of the delay.

   For example, if the Contractor claims a slow response time on submittals caused a delay, the Contractor must identify the specific submittals, all relevant dates, and then show on the applicable schedule, by circling or highlighting, the activities immediately affected by the delays. Also for example, if the Contractor claims it was delayed by another Contractor, the Contractor must identify the delaying Contractor, specifically what the delaying Contractor did or did not do that caused the delay, and then show the applicable schedule, by circling or highlighting, the activities immediately affected by the delays. Further by example, if the Contractor seeks an extension of time for unusually severe weather, the Contractor must submit comparative weather data along with a record of the actual weather at the job site and job site conditions.

6. Paragraph 6.4. Time is of the essence under the Contract Documents. If there is a delay, it is important to know what can be done to minimize the impact of the delay. It therefore is important that the Contractor provide specific recommendations on how to do so.

7. Paragraph 7. The Contractor must provide a specific and detailed breakdown of the additional compensation it seeks to recover. For future compensation, the Contractor shall provide its best estimate of such compensation.

8. Paragraph 8 and Acknowledgment. By submitting this Claim, the Contractor and its representative certify that after conscientious and thorough review and to the best of his or her knowledge and belief a) the Contractor has complied fully with the Instructions, b) the information in this Claim Form is accurate, c) the Contractor is entitled to recover the compensation in paragraph 7, and d) the Contractor has not knowingly presented a false or fraudulent claim. The Contractor by its authorized representative must acknowledge this Statement of Claim before a notary public.

End of Instructions

CERTIFICATE OF SUBSTANTIAL COMPLETION

Project: Pickerington Public Library Main Library Remodel	Contract For: General Contract
Owner: Pickerington Public Library Board of Trustees	CONTRACTOR: [insert name and address] _____

The Design Professional hereby certifies that the Date for Substantial Completion of the Contractor's Work as set forth in the Owner-Contractor Agreement is:

_____
(Insert Date for Substantial Completion of the Work)

The Design Professional hereby certifies that the Date for Substantial Completion in the Contractor's Agreement with the Owner (the "Agreement"), as extended by Change Orders and Claims submitted by the Contractor that have been Finally Resolved, as defined below, is:

1. Date for Substantial Completion in the Agreement (above): _____
2. Additional days added to Date for Substantial Completion by Change Order: _____
3. Additional days added by Claims that have been Finally Resolved: _____
4. Date for Substantial Completion in the Contract Adjusted by days under No. 2 and No. 3 _____

"Finally Resolved" means that the Design Professional has made a decision (or declined to make a decision) on the Claim under the General Conditions and that any litigation regarding the Claim has been concluded.

The Design Professional certifies that the Contractor's Work to the best of the Design Professional's knowledge, information, and belief was Substantially Complete, as Substantial Completion is defined in the Contract Documents, on _____.

The Design Professional hereby certifies that the difference between (a) the Date for Substantial Completion adjusted by the days under No. 2 and No. 3 above and (b) the date the Contractor's Work was Substantially Complete is _____days.

NOTICES OF DELAY. The Design Professional hereby certifies that all "NOTICES OF DELAY" submitted by the Contractor and described in the General Conditions are attached to this Certificate. This certification is solely for the purpose of identifying all "NOTICES OF DELAY" submitted by the Contractor and is not intended to imply that any of these NOTICES OF DELAY were properly submitted in accordance with Contract Documents or are valid.

STATEMENT OF CLAIM FORMS. The Design Professional hereby certifies that all Statement of Claim Forms described in the General Conditions and submitted by the Contractor are attached to this Certificate. This certification is solely for the purpose of identifying all Statement of Claim Forms submitted by the Contractor and is not intended to imply that any of these Statement of Claim Forms were properly submitted in accordance with Contract Documents or are valid.

PUNCHLIST ITEMS. A list of items to be completed by the Contractor is attached to this Certificate. The failure to include items on this list does not change the responsibility of the Contractor to complete its Work in accordance with the Contract Documents. The Contractor shall complete all items on the Punchlist in accordance with the Contract Documents.

Security, maintenance, utilities, damage to the Work and insurance are the responsibility of the Owner and the Contractor based on their operations pursuant to final completion of the Work.

Copies of this Certificate were provided to the Contractor and the Owner on _____

Signature: _____

Date: _____

CONTRACTOR'S AFFIDAVIT AND CERTIFICATION WITH LIST OF SUBCONTRACTORS AND SUPPLIERS WITH ANY AMOUNTS WITHHELD

PROJECT: Pickerington Public Library Main Library Remodel

CONTRACTOR: _____

In Support of PAYMENT APPLICATION No.: _____

For the Period Through: _____

STATE OF _____:
: SS,
COUNTY OF _____:

The undersigned after first being sworn swears that a) all previous progress payments received on account of the Work have been applied on account to discharge Contractor's legitimate obligations associated with prior Applications for Payment; b) set forth below is a complete list of its Subcontractors and Suppliers; and c) set forth below is a complete description of all amounts withheld from any Subcontractor or Supplier and the reason why. Attach additional sheets if necessary.

Typed or Printed Name of Subcontractor or Supplier	Address of Subcontractor or Supplier	Telephone Number of Subcontractor or Supplier

Typed or Printed Name of Subcontractor or Supplier	Address of Subcontractor or Supplier	Telephone Number of Subcontractor or Supplier

WITHHOLDINGS FROM SUBCONTRACTORS AND/OR SUPPLIERS:

Typed or Printed Name of Subcontractor or Supplier	Amount Withheld	Reason for Withholding

Moreover, Contractor certifies that, except for as set forth immediately above, Contractor has paid all of its subcontractors and suppliers who were due to be paid with the proceeds of the prior Application for Payment and Contractor acknowledges that Owner is relying upon such certification when paying Contractor the amount asked for in the payment application that this Affidavit and Certification supports.

CONTRACTOR: [insert name]

BY: _____
(Signature of authorized representative

NOTARY PUBLIC

Subscribed and sworn to before me on this date by _____on behalf of _____. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

_____
Signature of Notary Public

Notary Public: _____

My Commission Expires: _____

CONTRACTOR'S WAIVER & RELEASE AFFIDAVIT
("AFFIDAVIT")

Project: **Pickerington Public Library Main Library Remodel**

The undersigned hereby acknowledges receipt of payment for all Work on the Project through the date of the prior Application for Payment by the **Pickerington Public Library Board of Trustees** (the "Owner") with which it has a contract for the Project.

In return for said payment, and/or pursuant to certain contractual obligations of the undersigned, the undersigned hereby waives and releases any rights it has or may have through the date of the last Application for Payment to any and all types of claims relating to the Project, including without limitation claims of payment, Mechanic's Lien, stop notice, equitable lien, labor and material bond, breach of contract or unjust enrichment, or any other claim against the Owner, for any labor, materials, or equipment the undersigned may have delivered or provided to the Project, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form. The undersigned further certifies that this Affidavit covers claims by all contractors, subcontractors, and suppliers who may have provided any labor, material, or equipment to the Project through the undersigned or at the undersigned's request. The undersigned acknowledges that all such contractors, subcontractors, sub-subcontractors and suppliers have signed an affidavit in the form of this Affidavit releasing any and all claims against the Owner, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form. The undersigned hereby represents and warrants that it has paid any and all welfare, pension, vacation or other contributions required to be paid on account of the employment by the undersigned of any laborers on the Project.

This Affidavit is for the benefit of, and may be relied upon by the Owner. The undersigned hereby agrees to indemnify, defend and hold harmless each of the foregoing, the Project, work of improvement, and real property from any and all claims, or liens that are or should have been released in accordance with this Affidavit.

_____
Company Name

_____
Authorized Signature (Company Officer)

_____
Title

_____
Date

State of: _____County of _____

Subscribed and sworn to before me this_____ day of _____. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

Notary Public: _____

My Commission Expires: _____

SUBCONTRACTORS, SUPPLIERS
WAIVER & RELEASE AFFIDAVIT
("AFFIDAVIT")

Project**: Pickerington Public Library Main Library Remodel**

The undersigned hereby acknowledges receipt of payment for all Work on the Project through the date of the prior Application for Payment by the Contractor ("Contractor") with which it has a contract.

In return for said payment, and/or pursuant to certain contractual obligations of the undersigned, the undersigned hereby waives and releases any rights it has or may have through the date of the Contractor's last Application for Payment and to any and all types of claims relating to the Project, including without limitation claims of payment, Mechanic's Lien, stop notice, equitable lien, labor and material bond, breach of contract or unjust enrichment, or any other claim against the Contractor, the Contractor's surety, and/or the **Pickerington Public Library Board of Trustees** (the "Owner"), for any labor, materials, or equipment the undersigned may have delivered or provided to the Project, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form, a copy of which has been delivered to the Owner. The undersigned further certifies that this Affidavit covers claims by all contractors, subcontractors and suppliers through the date of the Contractor's last Application for Payment who may have provided any labor, material, or equipment to the Project through the undersigned or at the undersigned's request. The undersigned acknowledges that all such contractors, subcontractors, sub-subcontractors and suppliers have signed an affidavit in the form of this Affidavit releasing any and all claims against the Contractor, the Contractor's surety, and/or the Owner, except for any Claims made by properly and timely submitting a Statement of Claim form a copy of which has been delivered to the Owner. The undersigned hereby represents and warrants that it has paid any and all welfare, pension, vacation or other contributions required to be paid on account of the employment by the undersigned of any laborers on the Project.

The undersigned agrees that upon receipt of the payment from the Contractor with respect to the Contractor's current Application for Payment, it shall, if applicable, immediately execute and cause to be filed or recorded a legally effective Satisfaction of Lien, Release of Lien, or any other legal instrument necessary to cause prejudicial dismissal and release of any lien, encumbrance, lawsuit, or other claim against the Contractor, the Contractor's surety and the Owner, the property where the Project is located, and/or any surety bond posted by the Contractor or the Owner to the extent of the foresaid payment. Upon request of the Contractor, the undersigned shall provide proof of having complied with this obligation.

This Affidavit is for the benefit of, and may be relied upon by, the Contractor, the Contractor's surety and the Owner. The undersigned hereby agrees to indemnify, defend and hold harmless each of the foregoing, the Project, its Work, and real property from any and all claims, or liens that are or should have been released in accordance with this Affidavit and from any liability, cost, or expense incurred as a result of any breach of this Affidavit by the undersigned.

_____
Company Name

_____
Authorized Signature (Company Officer)

_____
Title

_____
Date

State of: _____County of _____

Subscribed and sworn to before me this_____ day of _____. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

Notary Public: _____

My Commission Expires: _____

CONTRACTOR'S FINAL WAIVER & RELEASE AFFIDAVIT
("AFFIDAVIT")

Project: Pickerington Public Library Main Library Project

In consideration for payment received from the Pickerington Public Library Board of Trustees (the "Owner") in the amount requested in Contractor's Final Application for Payment to the Owner, the receipt of which is hereby acknowledged, the undersigned Contractor hereby waives and releases any rights it has or may have to any and all types of claims relating to the Project, including without limitation claims of payment, Mechanic's Lien, stop notice, equitable lien, labor and material bond, breach of contract or unjust enrichment, or any other claim against the Owner, for any labor, materials, or equipment the undersigned may have delivered or provided to the Project, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form. The undersigned further certifies that this Affidavit covers claims by all contractors, subcontractors, and suppliers who may have provided any labor, material, or equipment to the Project through the undersigned or at the undersigned's request. The undersigned acknowledges that all such contractors, subcontractors, sub-subcontractors and suppliers have signed an affidavit in the form of this Affidavit releasing any and all claims against the Owner, except for any Claims the undersigned has made by properly and timely submitting a Statement of Claim form. The undersigned hereby represents and warrants that it has paid any and all welfare, pension, vacation or other contributions required to be paid on account of the employment by the undersigned of any laborers on the Project.

This Affidavit is for the benefit of, and may be relied upon by the Owner. The undersigned hereby agrees to indemnify, defend and hold harmless each of the foregoing, the Project, work of improvement, and real property from any and all claims, or liens that are or should have been released in accordance with this Affidavit.

_____
Company Name

_____
Authorized Signature (Company Officer)

_____
Title

_____
Date

State of: _____ County of _____

Subscribed and sworn to before me this_____ day of _____. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

Notary Public: _____

My Commission Expires: _____

SUBCONTRACTORS, SUPPLIERS
FINAL WAIVER & RELEASE AFFIDAVIT
("AFFIDAVIT")

Project: Pickerington Public Library Main Library Project

Upon receipt of payment in the amount of $_____ received from _____ ("Prime Contractor") the undersigned Subcontractor or Supplier waives and relinquishes all rights of lien or claim that it may have either in law or equity (including but not limited to rights under Ohio Mechanics' Lien Laws, O.R.C. 1311.01 *et seq*.) with respect to the construction project known as Main Library Project ("the Project"), for all labor, all equipment, and/or materials provided to or on behalf of the Project throughout its entirety, except for claims previously made pursuant to the agreement in place between Subcontractor or Supplier and Prime Contractor, and any lien previously perfected and remaining unreleased.

The undersigned Subcontractor or Supplier acknowledges and agrees that such payment represents final payment in full for all such labor, equipment and/or materials including retainage, if any, and that the Subcontractor or Supplier has completed its work on the Project. The undersigned Subcontractor or Supplier certifies that all amounts have been paid by the Subcontractor or Supplier for all work or materials furnished by others to the Subcontractor or Supplier for which the Subcontractor or Supplier has received previous payments from Prime Contractor, and Subcontractor or Supplier acknowledges that Prime Contractor is now making payment to the Subcontractor or Supplier in reliance upon such certification. The undersigned Subcontractor or Supplier further certifies that it will pay all amounts lawfully owing for all work or materials furnished by others to the Subcontractor or Supplier with the payment received from Contractor referenced herein.

This Affidavit is for the benefit of, and may be relied upon by, the Contractor, the Contractor's surety and the Owner. The undersigned hereby agrees to indemnify, defend and hold harmless each of the foregoing, the Project, its Work, and real property from any and all claims, or liens that are or should have been released in accordance with this Affidavit and from any liability, cost, or expense incurred as a result of any breach of this Affidavit by the undersigned.

IN WITNESS WHEREOF, the undersigned has caused this Affidavit to be executed by its authorized representative as of the date indicated below.

THE INDIVIDUAL SIGNING THIS AFFIDAVIT REPRESENTS THAT HE/SHE IS AUTHORIZED TO DO SO.

SUBCONTRACTOR OR SUPPLIER:

_____
Company Name

_____
Authorized Signature (Company Officer)

_____
Title

_____
Date

State of: _____County of _____

Subscribed and sworn to before me this_____ day of _____. The notarial act certified hereby is a jurat. An oath or affirmation was administered to the signer with regard to the notarial act certified to hereby.

Notary Public: _____

My Commission Expires: _____

PRE-BID SUBSTITUTION FORM

Note. Certain brands of material or apparatus are specified. Each bid will be based on these brands, which may be referred to in the Contract Documents as Standards. The use of another brand (referred to as a substitution or proposed equal in the Contract Documents, when a bidder or the contractor seeks to have a different brand of material or apparatus than that specified approved by the Owner for use in the Project) may be requested as provided in the Instructions to Bidders.

The detailed procedures for submitting substitutions are set forth in Paragraph J of the Instructions to Bidders.

Specification Section	Brand or Name Specified	Proposed Substitution

Prevailing Wage Determination Cover Letter

County: FAIRFIELD
Determination Date: 03/23/2023
Expiration Date: 06/23/2023

THE FOLLOWING PAGES ARE PREVAILING RATES OF WAGES ON PUBLIC IMPROVEMENTS FAIRLY ESTIMATED TO BE MORE THAN THE AMOUNT IN O.R.C. SEC. 4115.03 (b) (1) or (2), AS APPLICABLE.

Section 4115.05 provides, in part: "Where contracts are not awarded or construction undertaken within ninety days from the date of the establishment of the prevailing wages, there shall be a redetermination of the prevailing rate of wages before the contract is awarded." The expiration date of this wage schedule is listed above for your convenience only. This wage determination is not intended as a blanket determination to be used for all projects during this period without prior approval of this Department.

Section 4115.04, Ohio Revised Code provides, in part: "Such schedule of wages shall be attached to and made a part of the specifications for the work, and shall be printed on the bidding blanks where the work is done by contract..."

The contract between the letting authority and the successful bidder shall contain a statement requiring that mechanics and laborers be paid a prevailing rate of wage as required in Section 4115.06, Ohio Revised Code.

The contractor or subcontractor is required to file with the contracting public authority upon completion of the project and prior to final payment therefore an affidavit stating that he has fully complied with Chapter 4115 of the Ohio Revised Code.

The wage rates contained in this schedule are the "Prevailing Wages" as defined by Section 4115.03, Ohio Revised Code (the basic hourly rates plus certain fringe benefits). These rates and fringes shall be a minimum to be paid under a contract regulated by Chapter 4115 of the Ohio Revised Code by contractors and subcontractors. The prevailing wage rates contained in this schedule include the effective dates and wage rates currently on file. In cases where future effective dates are not included in this schedule, modifications to the wage schedule will be furnished to the Prevailing Wage Coordinator appointed by the public authority as soon as prevailing wage rates increases are received by this office.

"There shall be posted in a prominent and accessible place on the site of work a legible statement of the Schedule of Wage Rates specified in the contract to the various classifications of laborers, workmen, and mechanics employed, said statement to remain posted during the life of such contract." Section 4115.07, Ohio Revised Code.

Apprentices will be permitted to work only under a bona fide apprenticeship program if such program exists and if such program is registered with the Ohio Apprenticeship Council.

Section 4115.071 provides that no later than ten days before the first payment of wages is due to any employee of any contractor or subcontractor working on a contract regulated by Chapter 4115, Ohio Revised Code, the contracting public authority shall appoint one of his own employees to act as the prevailing wage coordinator for said contract. The duties of the prevailing wage coordinator are outlined in Section 4115.071 of the Ohio Revised Code.

Section 4115.05 provides for an escalator in the prevailing wage rate. Each time a new rate is established, that rate is required to be paid on all ongoing public improvement projects.

A further requirement of Section 4115.05 of the Ohio Revised Code is: "On the occasion of the first pay date under a contract, the contractor shall furnish each employee not covered by a collective bargaining agreement or understanding between employers and bona fide organizations of Labor with individual written notification of the job classification to which the employee is assigned, the prevailing wage determined to be applicable to that classification, separated into the hourly rate of pay and the fringe payments, and the identity of the prevailing wage Coordinator appointed by the public authority. The contractor or subcontractor shall furnish the same notification to each affected employee every time the job classification of the employee is changed."

Work performed in connection with the installation of modular furniture may be subject to prevailing wage.

THIS PACKET IS NOT TO BE SEPARATED BUT IS TO REMAIN COMPLETE AS IT IS SUBMITTED TO YOU. (Reference guidelines and forms are included in this packet to be helpful in the compliance of the Prevailing Wage law.)
wh1500

Prevailing Wage Rate
Skilled Crafts

Name of Union: Asbestos Local 207 OH

Change # : LCN01-2018fbLoc207OH

Craft : Asbestos Worker Effective Date : 08/23/2018 Last Posted : 08/23/2018

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Asbestos Abatement	$25.50	$7.25	$6.45	$0.65	$0.00	$0.00	$0.07	$0.00	$0.00	$39.92	$52.67
Trainee	$16.50	$7.25	$1.50	$0.65	$0.00	$0.00	$0.07	$0.00	$0.00	$25.97	$34.22

Special Calculation Note :

Ratio :

3 Journeymen to 1 Trainee

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ASHLAND, ASHTABULA*, ATHENS, AUGLAIZE, BROWN, BUTLER*, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, CUYAHOGA, DARKE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GEAUGA, GREENE, GUERNSEY, HAMILTON, HARDIN, HARRISON, HIGHLAND, HOCKING, HOLMES, HURON, KNOX, LAKE, LICKING, LOGAN, LORAIN, MADISON, MAHONING, MARION, MEDINA, MIAMI, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PORTAGE, PREBLE, RICHLAND, ROSS, SHELBY, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, UNION, VINTON, WARREN*, WAYNE

Special Jurisdictional Note : Butler County:(townships of Fairfield,Hanover,Liberty,Milford,Morgan,Oxford,Ripley,Ross,StClair,Union & Wayne.) (Lemon & Madison) Warren County: (townships of: Deerfield, Hamilton, Harlan, Salem, Union & Washington). (Clear Creek, Franklin, Mossie, Turtle Creek & Wayney). Ashtabula County: (post offices & townships of Ashtabula, Austinburg, Geneva, Harperfield, Jefferson, Plymouth & Saybrook) (townships of Andover, Cherry Valley, Colbrook, Canneaut, Denmark, Dorset, East Orwell, Hartsgrove, Kingville, Lenox, Monroe,Morgan,New Lyme,North Kingsville, Orwell, Pierpoint, Richmond Rock Creek, Rome, Shefield, Trumbull, Wayne, Williamsfield & Windsor) Erie County:(post offices & townships of Berlin, Berlin Heights,Birmingham,Florence ,Huron, Milan, Shinrock & Vermilion)

Details :

Asbestos & lead paint abatement including,but not limited to the removal or encapsulation of asbestos & lead paint,all work in conjunction with the preparation of the removal of same & all work in conjunction with the

clean up after said removal.The removal of all insulation materials, whether they contain asbestos or not, from mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) is recognized as being the exclusive work of the Asbestos Abatement Workers.

On all mechanical systems (pipes, boilers, ducts, flues, breaching, etc.) that are going to be demolished, the removal of all insulating materials whether they contain asbestos or not shall be the exclusive work of the Laborers.
An Abatement Journeyman is anyone who has more than 300 hours in the Asbestos Abatement field.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Asbestos Local 50 Zone 1

Change # : LCN01-2023ibAsbLoc50Zone1

Craft : Asbestos Worker Effective Date : 03/01/2023 Last Posted : 03/01/2023

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Asbestos Insulation Mechanic	$35.11		$8.45	$8.10	$0.50	$0.00	$3.25	$0.10	$0.00	$0.00	$55.51	$73.06
Firestop Technician	$35.11		$8.45	$8.10	$0.50	$0.00	$3.25	$0.10	$0.00	$0.00	$55.51	$73.06
Apprentice	**Percent**											
1st year	54.14	$19.01	$8.21	$0.00	$0.44	$0.00	$0.35	$0.10	$0.00	$0.00	$28.11	$37.61
2nd year	65.62	$23.04	$8.45	$0.95	$0.44	$0.00	$0.65	$0.10	$0.00	$0.00	$33.63	$45.15
3rd year	76.27	$26.78	$8.45	$2.38	$0.44	$0.00	$1.00	$0.10	$0.00	$0.00	$39.15	$52.54
4th year	84.13	$29.54	$8.45	$2.38	$0.44	$0.00	$1.00	$0.10	$0.00	$0.00	$41.91	$56.68

Special Calculation Note : *other is Labor Mgt Training Fund

Ratio :

1 Journeymen to 1 Apprentice
4 Journeymen to 1 Apprentice thereafter

Jurisdiction (* denotes special jurisdictional note) :

ATHENS, AUGLAIZE, BUTLER*, CLINTON, CRAWFORD, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GUERNSEY, HARDIN, HOCKING, KNOX, LICKING, LOGAN, MADISON, MARION, MORGAN, MORROW, MUSKINGUM, NOBLE, PERRY, PICKAWAY, ROSS, SHELBY, UNION, VINTON, WARREN*

Special Jurisdictional Note : Township of Butler County-Townships of Lemon and Madison. Warren County-Township of Cleer Creek, Franklin, Massie, Turtle Creek and Wayne

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Bricklayer Local 44

Change # : LCN01-2022sksLoc44

Craft : Bricklayer Effective Date : 06/01/2022 Last Posted : 06/01/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Bricklayer	$30.49		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$48.12	$63.36
Block Layer Stone Mason	$30.49		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$48.12	$63.36
Refractory Specialist	$31.37		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$49.00	$64.68
Gunnite Nozzleman	$31.37		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$49.00	$64.68
Cement Mason	$30.49		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$48.12	$63.36
Pointer Caulker Cleaner	$30.49		$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$48.12	$63.36
Mason Trainee												
1-90 Days	$15.25		$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$15.25	$22.87
91-365 Days	$15.25		$9.27	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$24.52	$32.14
366 Plus Days	$18.29		$9.27	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$27.56	$36.71
Apprentice	Percent											
1st 6 months	60.00	$18.29	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$35.92	$45.07
2nd 6 months	65.00	$19.82	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$37.45	$47.36
3rd 6 months	70.00	$21.34	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$38.97	$49.64
4th 6 months	75.00	$22.87	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$40.50	$51.93
5th 6 months	80.00	$24.39	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$42.02	$54.22
6th 6 months	85.00	$25.92	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$43.55	$56.50

7th 6 months	90.00	$27.44	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$45.07	$58.79
8th 6 months	95.00	$28.97	$9.27	$6.93	$0.68	$0.00	$0.75	$0.00	$0.00	$0.00	$46.60	$61.08

Special Calculation Note :

Ratio :

1-2 Journeyman to 1 Apprentice
3-4 Journeyman to 2 Apprentice
5-6 Journeyman to 2 Apprentice
7-10 Journeyman to 3 Apprentice

Mason Trainee Ratio

1 Apprentice permits 1 Mason Trainee
2 Apprentice permits 1 Mason Trainee
3 Apprentice permits 2 Mason Trainee
4 Apprentice permits 2 Mason Trainee

Jurisdiction (* denotes special jurisdictional note) :
COSHOCTON, FAIRFIELD, GUERNSEY, HOCKING, KNOX, LICKING, MORGAN, MUSKINGUM, NOBLE*, PERRY

Special Jurisdictional Note : In Noble County the following townships are included: (Beaver, Buffalo, Wayne and Seneca)

Details :
BAT registered apprentice must be employed prior to hiring mason trainee (s). A mason trainee MAY NOT work on a jobsite unless a registered apprentice is on the job.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Carpenter Millwright Local 1090 Columbus

Change # : LCN01-2022sksLoc1241

Craft : Carpenter Effective Date : 05/11/2022 Last Posted : 05/11/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Carpenter Millwright	$31.58		$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$56.99	$72.78
Apprentice	Percent											
1st 6 months	60.00	$18.95	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$44.36	$53.83
2nd 6 months	65.00	$20.53	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$45.94	$56.20
3rd 6 months	70.00	$22.11	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$47.52	$58.57
4th 6 months	75.00	$23.68	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$49.10	$60.94
5th 6 months	80.00	$25.26	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$50.67	$63.31
6th 6 months	85.00	$26.84	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$52.25	$65.67
7th 6 months	90.00	$28.42	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$53.83	$68.04
8th 6 months	95.00	$30.00	$7.50	$10.99	$0.50	$0.00	$6.28	$0.14	$0.00	$0.00	$55.41	$70.41

Special Calculation Note : Other is for UBC National Fund.

Ratio :

3 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FRANKLIN, GUERNSEY, LICKING, MADISON, MARION, MORGAN, MUSKINGUM, NOBLE, PERRY, PICKAWAY, UNION

Special Jurisdictional Note :

Details :

The term "Millwright and Machine Erectors"' jurisdiction shall mean the unloading, hoisting, rigging, skidding, moving, dismantling, aligning, erecting, assembling, repairing, maintenance and adjusting of all structures, processing areas either under cover, underground or elsewhere, required to process material, handle, manufacture or service, be it powered or receiving power manually, by steam, gas, electricity, gasoline, diesel,

nuclear, solar, water, air or chemically, and in industries such as and including, which are identified for the purpose of description, but not limited to, the following: woodworking plants; canning industries; steel mills; coffee roasting plants; paper and pulp; cellophane; stone crushing; gravel and sand washing and handling; refineries; grain storage and handling; asphalt plants; sewage disposal; water plants; laundries; bakeries; mixing plants; can, bottle and bag packing plants; textile mills; paint mills; breweries; milk processing plants; power plants; aluminum processing or manufacturing plants; and amusement and entertainment fields. The installation of mechanical equipment in atomic energy plants; installation of reactors in power plants; installation of control rods and equipment in reactors; and installation of mechanical equipment in rocket missile bases, launchers, launching gantry, floating bases, hydraulic escape doors and any and all component parts thereto, either assembled, semi-assembled or disassembled. The installation of, but not limited to, the following: setting-up of all engines, motors, generators, air compressors, fans, pumps, scales, hoppers, conveyors of all types, sizes and their supports; escalators; man lifts; moving sidewalks; hosts; dumb waiters; all types of feeding machinery; amusement devices; mechanical pin setters and spotters in bowling alleys; refrigeration equipment; and the installation of all types of equipment necessary and required to process material either in the manufacturing or servicing. The handling and installation of pulleys, gears, sheaves, fly wheels, air and vacuum drives, worm drives and gear drivers directly or indirectly coupled to motors, belts, chains, screws, legs, boots, guards, booth tanks, all bin valves, turn heads and indicators, shafting, bearings, cable sprockets cutting all key seats in new and old work, troughs, chippers, filters, calendars, rolls, winders, rewinders, slitters, cutters, wrapping machines, blowers, forging machines, rams, hydraulic or otherwise, planning, extruder, ball, dust collectors, equipment in meat packing plants, splicing or ropes and cables. The laying-out, fabrication and installation of protection equipment including machinery guards, making and setting of templates for machinery, fabrication of bolts, nuts, pans, dripping of holes for any equipment which the Millwrights install regardless of materials; all welding and burning regardless of type, fabrication of all lines, hose or tubing used in lubricating machinery installed by Millwrights; grinding, cleaning, servicing and any machine work necessary for any part of any equipment installed by the Millwrights; and the break-in and trail run of any equipment or machinery installed by the Millwrights. It is agreed the Millwrights shall use the layout tools and optic equipment necessary to perform their work.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 683 Inside

Change # : LCN01-2023ibLoc683In

Craft : Electrical Effective Date : 01/18/2023 Last Posted : 01/18/2023

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Electrician	$36.50	$10.70	$8.12	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$59.62	$77.87
Welding	$37.50	$10.70	$8.15	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$60.65	$79.40
Mdium Voltage Splicing	$37.50	$10.70	$8.15	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$60.65	$79.40
Over 100 feet	$54.75	$10.70	$8.67	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$78.42	$105.79
Level 1 CW 0 to 2000 hours	$13.13	$6.51	$0.39	$0.76	$0.00	$0.39	$0.10	$0.00	$0.00	$21.28	$27.85
Level 2 CW 2001 to 4000 hours	$14.00	$6.51	$0.42	$0.76	$0.00	$0.42	$0.10	$0.00	$0.00	$22.21	$29.21
Level 3 CW 4001 to 6000 hours	$14.88	$6.51	$0.45	$0.76	$0.00	$0.45	$0.10	$0.00	$0.00	$23.15	$30.59
Level 4 CW 6001 to 8000 hours	$16.63	$6.51	$0.50	$0.76	$0.00	$0.50	$0.10	$0.00	$0.00	$25.00	$33.32
Level 1 CE 8001 to 10000 hours	$18.38	$6.51	$0.55	$0.76	$0.00	$0.55	$0.10	$0.00	$0.00	$26.85	$36.04
Level 2 CE 10,001 to 12,000 hours	$20.13	$6.51	$0.60	$0.76	$0.00	$0.60	$0.10	$0.00	$0.00	$28.70	$38.77
Level 3 CE 12,001 to14,000 hours	$25.38	$6.51	$0.76	$0.76	$0.00	$0.76	$0.10	$0.00	$0.00	$34.27	$46.96
Apprentice	Percent										

0-1000 hrs 1st Period	40.00	$14.60	$10.70	$3.25	$0.80	$0.00	$1.40	$0.00	$0.00	$0.00	$30.75	$38.05
1001-2000 hrs 2nd Period	45.02	$16.43	$10.70	$3.65	$0.80	$0.00	$1.58	$0.00	$0.00	$0.00	$33.16	$41.38
2001-3500 hrs 3rd Period	55.00	$20.08	$10.70	$4.46	$0.80	$0.00	$1.93	$0.00	$0.00	$0.00	$37.96	$48.00
3501-5000 hrs 4th Period	65.00	$23.73	$10.70	$5.27	$0.80	$0.00	$2.28	$0.00	$0.00	$0.00	$42.77	$54.64
5001-6500 hrs 5th Period	70.00	$25.55	$10.70	$5.68	$0.80	$0.00	$2.45	$0.00	$0.00	$0.00	$45.18	$57.95
6501-8000 hrs 6th Period	80.00	$29.20	$10.70	$6.50	$0.80	$0.00	$2.80	$0.00	$0.00	$0.00	$50.00	$64.60

Special Calculation Note : Other is Administrative Fee

Ratio :

1 to 3 Journeyman to 2 Apprentices
4 to 6 Journeyman to 4 Apprentices

Ratio
Construction Wireman and Construction Electrician
1 Journeyman to 2 Apprentices to 2 CW/CE
With a MAXIMUM of 6 CW/CE an on any jobsite

Construction Wireman and Construction Electricians may work on residential projects without working under the supervision of a Journeyman Wireman. On ALL other job sites, Construction Wireman and Construction Electricians CAN only be employed after an APPRENTICE IS EMPLOYED on the job site.

Jurisdiction (* denotes special jurisdictional note) :

CHAMPAIGN, CLARK, DELAWARE, FAIRFIELD, FRANKLIN, MADISON, PICKAWAY*, UNION

Special Jurisdictional Note : In Pickaway County the following townships: Circleville,Darby,Harrison,Jackson,Madison,Monroe,Muhlenberg,Scioto,Walnut,Washington.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Electrical Local 683 Inside Lt Commercial South West

Change # : LCN01-2023ibLoc683In

Craft : Electrical Effective Date : 01/18/2023 Last Posted : 01/18/2023

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Electrician	$36.50		$10.70	$8.12	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$59.62	$77.87
Welding	$37.50		$10.70	$8.15	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$60.65	$79.40
Medium Voltage Splicing	$37.50		$10.70	$8.15	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$60.65	$79.40
Over 100 feet	$54.75		$10.70	$8.67	$0.80	$0.00	$3.50	$0.00	$0.00	$0.00	$78.42	$105.79
CE-3 12,001-14,000 Hrs	$25.38		$6.51	$0.76	$0.76	$0.00	$0.76	$0.10	$0.00	$0.00	$34.27	$46.96
CE-2 10,001-12,000 Hrs	$20.13		$6.51	$0.60	$0.76	$0.00	$0.60	$0.10	$0.00	$0.00	$28.70	$38.77
CE-1 8,001-10,000 Hrs	$18.38		$6.51	$0.55	$0.76	$0.00	$0.55	$0.10	$0.00	$0.00	$26.85	$36.04
CW-4 6,001-8,000 Hrs	$16.63		$6.51	$0.50	$0.76	$0.00	$0.50	$0.10	$0.00	$0.00	$25.00	$33.32
CW-3 4,001-6,000 Hrs	$14.88		$6.51	$0.45	$0.76	$0.00	$0.45	$0.10	$0.00	$0.00	$23.15	$30.59
CW-2 2,001-4,000 Hrs	$14.00		$6.51	$0.42	$0.76	$0.00	$0.42	$0.10	$0.00	$0.00	$22.21	$29.21
CW-1 0-2,000 Hrs	$13.13		$6.51	$0.39	$0.76	$0.00	$0.39	$0.10	$0.00	$0.00	$21.28	$27.85
Apprentice	**Percent**											
0-1000 hrs 1st Period	40.00	$14.60	$10.70	$3.25	$0.80	$0.00	$1.40	$0.00	$0.00	$0.00	$30.75	$38.05
1001-2000 hrs 2nd Period	45.02	$16.43	$10.70	$3.65	$0.80	$0.00	$1.58	$0.00	$0.00	$0.00	$33.16	$41.38
2001-3500 hrs 3rd	55.00	$20.08	$10.70	$4.46	$0.80	$0.00	$1.93	$0.00	$0.00	$0.00	$37.96	$48.00

Period												
3501-5000 hrs 4th Period	65.00	$23.73	$10.70	$5.27	$0.80	$0.00	$2.28	$0.00	$0.00	$0.00	$42.77	$54.64
5001-6500 hrs 5th Period	70.00	$25.55	$10.70	$5.68	$0.80	$0.00	$2.45	$0.00	$0.00	$0.00	$45.18	$57.95
6501-8000 hrs 6th Period	80.00	$29.20	$10.70	$6.50	$0.80	$0.00	$2.80	$0.00	$0.00	$0.00	$50.00	$64.60

Special Calculation Note : Other is administrative fee

Ratio :

2 Apprentices for every 3 Journeyman Wireman or fraction thereof;
1 to 3 Journeyman to 2 Apprentices
4 to 6 Journeyman to 4 Apprentices

Construction Electrician and Construction Wireman Ratio
There shall be a minimum ratio of one inside Journeyman to every (4) employees of different classification per jobsite. An inside Journeyman Wireman is required on the project as the fifth (5th) worker or when apprentices are used.

Jurisdiction (* denotes special jurisdictional note) :
CHAMPAIGN, CLARK, DELAWARE, FAIRFIELD, FRANKLIN, MADISON, PICKAWAY*, UNION

Special Jurisdictional Note : In Pickaway County the following townships: Circleville,Darby,Harrison,Jackson,Madison,Monroe,Muhlenberg,Scioto,Walnut,Washington.

The scope of work for the light commercial agreement shall apply to the following facilities not to exceed 200,000 square feet; office buildings, shopping centers, auto sales agencies and garages, churches, funeral homes, nursing homes, hotels, retail and wholesale facilities, small stand-alone manufacturing facilities when free standing and not part of a larger facility (not to exceed 50,000 square fee), solar projects (500 panels or less) unless otherwise covered under the agreement, lighting retrofits (when not associated with remodels involving branch re-circuiting) lighting retrofits shall be defined as the changing of lamps and ballasts in existing light fixtures and shall also include the one for one replacement of existing fixtures, warehouses, gas stations, food service centers, restaurants, entertainment facilities, hospitals, clinics, motels, residential buildings.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Glazier Local 372

Change # : LCN02-2020fbLoc372

Craft : Glazier Effective Date : 11/01/2020 Last Posted : 10/28/2020

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Glazier	$26.78		$5.74	$10.14	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$43.07	$56.46
Apprentice	Percent											
1-750 hrs	50.00	$13.39	$5.74	$2.84	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$22.38	$29.08
751-1500 hrs	60.00	$16.07	$5.74	$2.84	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$25.06	$33.09
1501-2250 hrs	65.00	$17.41	$5.74	$2.84	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$26.40	$35.10
2251-3000 hrs	70.00	$18.75	$5.74	$2.84	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$27.74	$37.11
3001-3750 hrs	75.00	$20.08	$5.74	$6.55	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$32.78	$42.83
3751-4500 hrs	80.00	$21.42	$5.74	$6.55	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$34.12	$44.84
4501-5250 hrs	85.00	$22.76	$5.74	$6.55	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$35.46	$46.84
5251-6000 hrs	90.00	$24.10	$5.74	$6.55	$0.41	$0.00	$0.00	$0.00	$0.00	$0.00	$36.80	$48.85

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FAYETTE*, FRANKLIN, HOCKING, JACKSON, KNOX, LICKING, MADISON, MARION, MORROW, MUSKINGUM, PERRY, PICKAWAY, PIKE, ROSS, UNION, VINTON

Special Jurisdictional Note : Fayette County except the eastern portion with Route #141 being the dividing line.

Details :

A premium of one dollar ($1.00) per hour above regular hourly rate of pay shall be paid for each hour worked by every employee from any mechanical lift or scaffold,either suspended or supported including the Hex type

scaffolding.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Ironworker Local 172

Change # : LCN01-2022sksLoc172

Craft : Ironworker Effective Date : 06/01/2022 Last Posted : 06/01/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Ironworker	$33.27		$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$55.18	$71.81
Rigger Welder Reinforcing Sheeter Fence Erector Machinery Mover	$33.27		$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$55.18	$71.81
Apprentice	**Percent**											
1st YEAR 0 - 6 Months	60.02	$19.97	$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$41.88	$51.86
2nd YEAR 13 - 18 Months	70.00	$23.29	$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$45.20	$56.84
3rd YEAR 25 - 30 Months	80.00	$26.62	$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$48.53	$61.83
4th YEAR 37 - 42 Months	90.02	$29.95	$8.70	$9.50	$0.71	$0.00	$3.00	$0.00	$0.00	$0.00	$51.86	$66.83

Special Calculation Note :

Ratio :

Rod Work
3 Journeymen to 1 Apprentice

Structural Work
3 Journeymen to 1 Apprentice

Finishing, Steel Sash, Stairway and Ornamental
1 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

CHAMPAIGN*, CLARK, CRAWFORD*, DELAWARE, FAIRFIELD, FAYETTE*, FRANKLIN, HARDIN*, HIGHLAND*, HOCKING, JACKSON*, KNOX, LICKING, LOGAN*, MADISON*, MARION, MORROW, PERRY, PICKAWAY, PIKE, ROSS, UNION, VINTON, WYANDOT*

Sheet Gang
1 Apprentice for every sheeting gang per project

Special Jurisdictional Note : Champaign County Twps included: Wayne, Rush, Goshen. Crawford County Twps included: Bucyrus, Dallas, Jefferson, Jackson, Whetstone, Polk, Sandusky. Fayette County Twps included: Paint, Marion, Perry, Madison, Wayne, Union. Hardin County Twps included: McDonald, Taylorcreek, Hale, Dudley, Pleasant, Goshen, Blanchard, Lynn, Jackson, Buck, Cessna, Marion, Washington. Highland County Twps included: Madison. Jackson County Twps included: Liberty, Washington, Milton, Jackson, Coal, Wilkesville. Logan County Twps included: Monroe, Zane, Jefferson, Perry, Rush Creek, Bokes Creek. Madison County Twps included: Range, Paint, Fairfield, Sommerford, Jefferson, Pike, Canaan, Pleasant, Oak Run, Union, Deer Creek, Monroe, Darby. Pike County Twps included: Perry, Benton, Mifflin, Sunfish, Newton, Prebble, Pee Pee, Seal, Beaver, Jackson. Wyandot County Twps included: Jackson, Marseilles, Mifflin, Pitt, Antrim. Muskingum County includes:Jackson,Licking,Hope Well, Newton, Clay, Cass, Muskingum falls,Springfield,Madison,Washington,Wayne,Brush Creek.

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Labor Local 423

Change # : LCN01-2022sksLoc423

Craft : Laborer Effective Date : 06/29/2022 Last Posted : 06/29/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Laborer Group 1	$29.68		$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$41.83	$56.67
Group 2	$29.99		$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$42.14	$57.14
Group 3	$30.30		$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$42.45	$57.60
Group 4	$30.61		$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$42.76	$58.07
Apprentice	**Percent**											
0-1000 hrs	60.00	$17.81	$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$29.96	$38.86
1001-2000 hrs	70.00	$20.78	$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$32.93	$43.31
2001-3000 hrs	80.00	$23.74	$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$35.89	$47.77
3001-4000 hrs	90.00	$26.71	$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$38.86	$52.22
More than 4000 hrs	100.00	$29.68	$7.70	$3.95	$0.40	$0.00	$0.00	$0.00	$0.10	$0.00	$41.83	$56.67

Special Calculation Note : No special calculations for this skilled craft wage rate are required at this time.

Ratio :

1 Journeymen to 1 Apprentice
4 Journeymen to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

FAIRFIELD, FAYETTE, FRANKLIN, HOCKING, LICKING, MADISON, PICKAWAY, UNION

Special Jurisdictional Note :

Details :

Group 1:
General Laborers, Carpenter Tender, Cathodic Protection, Cleaning Debris, Cleaning of all Material, General Clean-up including Vacuum Cleaning, Scraping and Cleaning of Walls and Floors, Landscape, Installation and Removal of Fencing, Sod Layers, All Portable Heaters, Flagman, Loading and Unloading of all Trucks, Handling and conveying all Materials, Washing of all Windows, Conveyer Belt, All Water Pumps up to and including three (3) inch intake, Watchman, Water Boy and Tool Room Attendant.
Group 1- Swimming Pools, Pool Decks, Surrounding Sidewalk and Parking Garages.

Group 2:
Skid Steer, Concrete Specialists, Brick Tender, Stone Mason Tender, Plaster Tender, Mortar Mixer and Operator, Cement Mason Tender, Construction Specialist, All Scaffold Builders (Swinging Scaffolds), Lagging, Bush Hammering,Jack Hammer Operator, Air or Electric Pneumatic Tool Operator, Power Driven Tools, Power Buggy Operators, Pouring and Placement of all concrete, Fork Lift Operators, Power Wheelbarrow Operators, Asphalt and Blacktop Rakers, Wrecker/Demolition, Sand Blasting and Chipping, Welders on Demolition, Grade Checkers, a person on a bucket pouring concrete, Gunite Nozzle man, Wagon and Churn Drill Operator, Concrete Saw Operator, Brush Feeders on pulverizers, Pipe Layers, Bottom Man, Laser Gun, Burners, Sand Blasting of concrete, Vibrator Man, Steward, Signal Man, Caisson, Caisson Bottom Man, Piledrivers, Asbestos and Lead Abatement Laborers.

Hazardous Waste (Level B): Any work requiring the following protective equipment must be paid at Group 2 rate,
A protective suit and an Air Purifying Respirator (APR) with the appropriate filter canisters. The ensemble is used when contaminants are reliably known not to be hazardous to the skin and not IDLH (Immediately Dangerous To Life or Health) and correct filter protection is available. This ensemble offers adequate protection for many jobs. Heat stress may be a problem due to inherent restrictions to breathing in an APR. Also, normal job related injury risk will be nearly as high as for Level C Equipment.

Group 3 Hazardous (Level C:) Any work requiring the following protective equipment must be paid at Group 3 rate,
A chemically resistant splash suit and a (SCBA) or Airline Respirator. This ensemble is required when the situation is very hazardous, such as oxygen deficient atmospheres, IDLH atmospheres, or confined space entries, but the risk of skin exposure is not as great as in Level D situations. Then Level C ensemble gives the second highest level of protection, but also puts physical stress on the worker; primarily heat stress, reduced vision,dexterity and mobility directly attributable to wearing of the protective equipment. Therefore, in addition to the hazardous material, the hazard of the normal job related injuries is greatly increased.

Group 4 Hazardous Waste (Level D) requiring the following protective equipment must be paid at Group 4 rate, Protective equipment is required when the area has been known to contain extremely toxic contaminants or contaminants unknown but may be expected to be extremely toxic and /or Immediately Dangerous to Life and Health (IDLH). This ensemble includes fully encapsulated chemical suit (moon suit), Self Contained Breathing Apparatus (SCBA), or Airline Fed Respirator, and various types and numbers of boots and gloves, cool vests and voice activated radios are optional equipment sometimes worn. Level D ensembles provide the highest level of protection from contaminants but places the greatest physical and mental stress on the worker. The claustrophobic environment of the moon suit causes anxiety in most people, which greatly increases the already inherent heat stress problems. Also, this ensemble reduces vision, mobility, dexterity, and communication capacity, all of which increases the risk of normal job related injuries, ie., slips ,falls, caught between, etc
.
Hazardous Pay of $0.25 per hour shall be paid in addition to classifications shown above
Swing Scaffolds (suspended by rope or pulley), and swing scaffolds for grain storage tank or grain elevators, when the work is performed at a height of fifty (50) feet or more above the foundations or grade level, whichever is higher. Caisson work and tunnel work (depth being 15 feet or deeper)

Hazardous Waste Removal & Lead Abatement Workers: Exclusive or "Hot" area with toxic or hazardous materials, when one of the following personal protective equipment ensembles will be required for necessary protection against toxic contaminants. All of the ensembles increase the risks of certain types of worker-related injuries. When Laborers complement another craft receiving premium rate of pay Laborers will also receive premium pay for this "HOT" type of work.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Operating Engineers - Building Local 18 - Zone III

Change # : LCN01-2022sksLoc18zone3

Craft : Operating Engineer Effective Date : 05/25/2022 Last Posted : 05/25/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Operator Group A	$40.19		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$56.44	$76.53
Operator Group B	$40.07		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$56.32	$76.35
Operator Group C	$39.03		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$55.28	$74.79
Operator Group D	$37.85		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$54.10	$73.03
Operator Group E	$32.39		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$48.64	$64.83
Master Mechanic	$40.44		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$56.69	$76.91
Cranes & Mobile Concrete Pumps 150'-180'	$40.69		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$56.94	$77.28
Cranes & Mobile Concrete Pumps 180'-249'	$41.19		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$57.44	$78.03
Cranes & Mobile Concrete Pumps 249' and over	$41.44		$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$57.69	$78.41
Apprentice	Percent											
1st Year	50.00	$20.09	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$36.35	$46.39
2nd Year	60.00	$24.11	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$40.36	$52.42
3rd Year	70.00	$28.13	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$44.38	$58.45
4th Year	80.00	$32.15	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$48.40	$64.48
Field Mechanic Trainee												

1st Year	50.00	$20.09	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$36.35	$46.39
2nd Year	60.00	$24.11	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$40.36	$52.42
3rd Year	70.00	$28.13	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$44.38	$58.45
4th Year	80.00	$32.15	$9.01	$6.25	$0.85	$0.00	$0.00	$0.09	$0.00	$0.05	$48.40	$64.48

Special Calculation Note : Other: Education & Safety $0.09; *Misc is National Training

Ratio :

For every (3) Operating Engineer Journeymen employed by the company there may be employed (1) Registered Apprentice or trainee Engineer through the referral when they are available. An apprenice, while employed as part of a crew per Article VIII, paragraph 78, will not be subject to the apprenticeship ratios in this collective bargaining agreement

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, MADISON, MARION, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, TUSCARAWAS, UNION, VAN WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WYANDOT

Special Jurisdictional Note :

Details :

Note: There will be a 10% increase for the apprentices on top of the percentages listed above provided they are operating mobile equipment. Mechanic Trainees will receive 10% increase if required to have CDL

Group A- Barrier Moving Machines; Boiler Operators or Compressor Operators, when compressor or boiler is mounted on crane (Piggyback Operation); Boom Trucks (all types); Cableways Cherry Pickers; Combination - Concrete Mixers & Towers; All Concrete Pumps with Booms; Cranes (all types); Compact Cranes, track or rubber over 4,000 pounds capacity; Cranes self-erecting, stationary, track or truck (all configurations); Derricks (all types); Draglines; Dredges (dipper, clam or suction) 3-man crew; Elevating Graders or Euclid Loaders; Floating Equipment; Forklift (rough terrain with winch/hoist); Gradalls; Helicopter Operators, hoisting building materials; Helicopter Winch Operators, Hoisting building materials; Hoes (All types); Hoists (with two or more drums in use); Horizonal Directional Drill; Hydraulic Gantry (lift system); Laser Finishing Machines; Laser Screed and like equipment; Lift Slab or Panel Jack Operators; Locomotives (all types); Maintenance Operator/Technician(Mechanic Operator/Technician and/or Welder); Mixers, paving (multiple drum); Mobile Concrete Pumps, with booms; Panelboards, (all types on site); Pile Drivers; Power Shovels; Prentice Loader; Rail Tamper (with automatic lifting and aligning device); Rotary Drills (all), used on caissons for foundations and sub-structure; Side Booms; Slip Form Pavers; Straddle Carriers (Building Construction on site); Trench Machines (over 24" wide); Tug Boats.

Group B - Articulating/end dumps (minus $4.00/hour from Group B rate); Asphalt Pavers; Bobcat-type and/or skid steer loader with hoe attachment greater than 7000 lbs.; Bulldozers; CMI type Equipment; Concrete Saw, Vermeer-type; Endloaders; Hydro Milling Machine; Kolman-type Loaders (Dirt Loading); Lead Greasemen; Mucking Machines; Pettibone-Rail Equipment; Power Graders; Power Scoops; Power Scrapers; Push Cats;, Rotomills (all), grinders and planers of all types.

Group C - A-Frames; Air Compressors, Pressurizing Shafts or Tunnels; All Asphalt Rollers; Bobcat-type and/or Skid Steer Loader with or without attachments; Boilers (15 lbs. pressure and over); All Concrete Pumps (without booms with 5 inch system); Fork Lifts (except masonry); Highway Drills - all types (with integral power); Hoists (with one drum); House Elevators (except those automatic call button controlled), Buck Hoists, Transport Platforms, Construction Elevators; Hydro Vac/Excavator (when a second person is needed, the rate of pay will be "Class E"); Man Lifts; Material hoist/elevators; Mud Jacks; Pressure Grouting; Pump Operators (installing or operating Well Points or other types of Dewatering Systems); Pumps (4 inches and over discharge); Railroad Tie (Inserter/Remover); Rotovator (Lime-Soil Stabilizer); Submersible Pumps (4"and over discharge); Switch & Tie Tampers (without lifting and aligning device); Trench Machines (24" and under); Utility Operators.

Group D - Backfillers and Tampers; Ballast Re-locator; Batch Plant Operators; Bar and Joint Installing Machines; Bull Floats; Burlap and Curing Machines; Clefplanes; Compressors, on building construction; Concrete Mixers, more than one bag capacity; Concrete Mixers, one bag capacity (side loaders); All Concrete Pumps (without boom with 4" or smaller system); Concrete Spreader; Conveyors, used for handling building materials; Crushers; Deckhands; Drum Fireman (in asphalt plants); Farm type tractors pulling attachments; Finishing Machines; Form Trenchers; Generators: Gunite Machines; Hydro-seeders; Pavement Breakers (hydraulic or cable); Post Drivers; Post Hole Diggers; Pressure Pumps (over 1/2") discharge); Road Widening Trenchers; Rollers (except asphalt); Self-propelled sub-graders; Shotcrete Machines; Tire Repairmen; Tractors, pulling sheepsfoot post roller or grader; VAC/ALLS; Vibratory Compactors, with integral power; Welders.

Group E – Allen Screed Paver (concrete); Boilers (less than 15 lbs. pressure); Cranes-Compact, track or rubber (under 4,000 pounds capacity); Directional Drill "Locator"; Fueling and greasing +$3.00; Inboard/outboard Motor Boat Launches; Light Plant Operators; Masonry Fork Lifts; Oilers/Helpers; Power Driven Heaters (oil fired); Power Scrubbers; Power Sweepers; Pumps (under 4 inch discharge); Signalperson, Submersible Pumps (under 4" discharge).

Master Mechanics - Master Mechanic

Cranes 150' – 180' - Boom & Jib 150 - 180 feet

Cranes 180' – 249' - Boom & Jib 180 - 249 feet

Cranes 250' and over - Boom & Jib 250-feet or over

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 1275

Change # : LCN01-2022sksLoc1275

Craft : Painter Effective Date : 06/01/2022 Last Posted : 06/01/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Painter Brush Roll	$27.36		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.06	$55.74
Wall Washer	$27.36		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.06	$55.74
Spray	$27.86		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.56	$56.49
Structural Steel Swing Stage	$27.66		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.36	$56.19
Sandblast, Steam Clean, Water Blasting (3500 PSI and Over) and Hazardous	$28.06		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.76	$56.79
Vinyl Hanging	$27.86		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.56	$56.49
Apprentice	**Percent**											
0-1500 hrs	80.00	$21.89	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$29.05	$39.99
1501-3000 hrs	85.00	$23.26	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$30.42	$42.04
3001-4500 hrs	90.00	$24.62	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$31.78	$44.10
4501-6000 hrs	95.00	$25.99	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$33.15	$46.15

Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, KNOX, LICKING, MADISON, MUSKINGUM, PERRY, PICKAWAY, ROSS, UNION

Special Jurisdictional Note :

Details :

Heavy Highway Class 1 are qualified painters,blasters,riggers.
Class 2 Equipment Tenders /or containment Builders are hired to tend employers equipment also engage in the building & moving of containment systems.
Class 3 support personnel will perform Quality control duties,clean abrasive blast materials, load and unload trucks, handle all materials, man safety boats, & handle traffic control.
All Tanks 50,000 gallon capacity or more will be at the tank stated rate.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 1275 HevHwy

Change # : LCN01-2022sksLoc1275

Craft : Painter Effective Date : 06/01/2022 Last Posted : 06/01/2022

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Painter Bridge Class 1	$37.42	$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$52.12	$70.83
Painter Bridges Class 2 Rigger, Containment Builder, Spot Blaster	$34.42	$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$49.12	$66.33
Painter Bridges Class 3 Equipment Operator/Field Mechanic, Grit Reclamation, Paint Mix, Traffic Control, Boat Person, Driver (0-5 Years Exp.)	$27.42	$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$42.12	$55.83
Painter Bridges Class 3 Equipment Operator/Field Mechanic, Grit Reclamation, Paint Mix, Traffic Control, Boat Person, Driver (plus 5 Years Exp.)	$30.42	$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$45.12	$60.33
Painter Bridges Class 4 Concrete Sealing, Concrete	$26.42	$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$41.12	$54.33

Blasting Power Washing												
Painter Bridges Class 5 Quality Control, Quality Assurance, Traffic Safety Competent Person	$30.42		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$45.12	$60.33
Apprentice	**Percent**											
1st 0-1500 hrs	77.77	$29.10	$5.84	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$36.16	$50.71
2nd 1501-3000 hrs	82.59	$30.91	$5.84	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$37.97	$53.42
3rd 3001-4500 hrs	87.47	$32.73	$5.84	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$39.79	$56.16
4th 4501-6000 hrs	92.33	$34.55	$5.84	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$41.61	$58.88

Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, KNOX, LICKING, MADISON, MUSKINGUM, PERRY, PICKAWAY, ROSS, UNION

Special Jurisdictional Note :

Details :

Heavy Highway Class 1 are qualified painters,blasters,riggers. Class 2 Equipment Tenders /or containment Builders are hired to tend employers equipment also engage in the building & moving of containment systems. Class 3 support personnel will perform Quality control duties,clean abrasive blast materials, load and unload trucks, handle all materials, man safety boats, & handle traffic control.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 1275 Industrial

Change # : LCN01-2022sksLoc1275

Craft : Painter Effective Date : 06/01/2022 Last Posted : 06/01/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Painter Brush Roll	$28.81		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$43.51	$57.92
Power Tool Cleaningr	$29.81		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$44.51	$59.42
Spray Painting	$29.31		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$44.01	$58.67
Sand Blast, Steam Clean & Pressure Washing Above 3500 PSI	$29.51		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$44.21	$58.97
Stacks and towers	$31.62		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$46.32	$62.13
Tanks - All Tanks 50,000 gallon capacity or more	$31.62		$5.94	$8.31	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$46.32	$62.13
Apprentice	Percent											
0-1500 hrs	80.00	$23.05	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$30.21	$41.73
1501-3000 hrs	85.00	$24.49	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$31.65	$43.89
3001-4500 hrs	90.00	$25.93	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$33.09	$46.05
4501-6000 hrs	95.00	$27.37	$5.94	$0.77	$0.45	$0.00	$0.00	$0.00	$0.00	$0.00	$34.53	$48.21

Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, KNOX, LICKING, MADISON, MUSKINGUM,

PERRY, PICKAWAY, ROSS, UNION

Special Jurisdictional Note :

Details :

Definition of Industrial Classification:

Industrial Facilities to be included in the Industrial Classification shall include; Water Treatment, Waste Water Treatment, Natural Gas and related facilities, refineries, transmission pipe lines, electrical transmission towers and or switching /sub stations and Power Plants.

Exclusions from the industrial classification are Power Plants that generate power to a single customer; such as an emergency power supplier or a Hospital, Information Technology Facility, Sporting/Event or Arena/Stadium type facility. This exclusion would also be given to any commercial office space located within the facilities property. The excluded spaces shall be done under the Commercial Wage rates.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 639

Change # : LCNO1-2015fbLoc639

Craft : Painter Effective Date : 06/10/2015 Last Posted : 06/10/2015

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Painter Metal Finisher/Helpers											
Top Helper Class A	$19.09	$3.65	$0.00	$0.00	$0.66	$0.00	$0.00	$0.00	$0.00	$23.40	$32.94
Top Helper Class B	$19.09	$3.65	$0.65	$0.00	$1.03	$0.00	$0.37	$0.00	$0.00	$24.79	$34.33
Top Helper Class C	$19.09	$3.65	$1.00	$0.00	$1.76	$0.00	$0.37	$0.00	$0.00	$25.87	$35.41
Helper Class A	$14.69	$3.65	$0.00	$0.00	$0.51	$0.00	$0.00	$0.00	$0.00	$18.85	$26.19
Helper Class B	$14.69	$3.65	$0.65	$0.00	$0.79	$0.00	$0.28	$0.00	$0.00	$20.06	$27.40
Helper Class C	$14.69	$3.65	$1.00	$0.00	$1.64	$0.00	$0.28	$0.00	$0.00	$21.26	$28.60
New Hire 90 Days	$11.00	$3.65	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$14.65	$20.15

Special Calculation Note : Other is Sick and Personal Time

Ratio :

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, CUYAHOGA, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GEAUGA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAKE, LAWRENCE, LICKING, LOGAN, LORAIN, LUCAS, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW, MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY,

SCIOTO, SENECA, SHELBY, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, UNION, VAN WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

Top Helper: Shall perform the responsibilities of a Helper and be responsible for the setup, break down, safety and quality of the company's product.
Helper : Shall be responsible for performing tasks in refinishing, compliance with safety procedures, setting up and breaking down job sites, scaffolding and swing stages and preparing surfaces for refinishing including but not limited to, masking and stripping and cleaning, oxidizing, polishing and scratch removal on various surfaces .
Class A Workers: Less than 1 Year of Service.
Class B Workers: More than 1 and less than 8 Years of Service.
Class C Workers: More than 8 Years of Service.

Metal Polisher Scope of Work: Polishing, buffing, stripping, coloring, lacquering, spraying, cleaning and maintenance of ornamental and architectural metals, iron, bronze, nickel, aluminum and stainless steel and in mental specialty work, various stone finishes, stone specialty work and any other work pertaining to the finishing of metal, stones, woods, and any window washing/cleaning done in conjunction with this work, using chemicals, solvents, coatings and hand applied lacquer thinner, removing scratches from mirrow finished metals, burnishing of bronze, statuary finishes on exterior and interior surfaces and the use of all tools required to perform such work, including but not limited to polishes, spray equipment and scaffolding.

Swing State Rate: All work on scaffold 4 sections or higher, including any boom lifts and swing stage scaffolds including the rigging and derigging of hanging/suspended swing stage systems and rappelling/bolson chair work, ADD $1.50 per hour.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Painter Local 639 Zone 2 Sign

Change # : LCN01-2023ibLoc639

Craft : Painter Effective Date : 03/22/2023 Last Posted : 03/22/2023

	BHR	Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
		H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification											
Painter Sign Journeyman Tech/Team Leader Class A	$25.28	$1.70	$0.21	$0.00	$0.00	$0.00	$0.68	$0.00	$0.00	$27.87	$40.51
Painter Sign Journeyman Tech/Team Leader Class B	$25.28	$1.70	$0.21	$0.00	$0.49	$0.00	$0.68	$0.00	$0.00	$28.36	$41.00
Painter Sign Journeyman Tech/Team Leader Class C	$25.28	$1.70	$0.21	$0.00	$0.97	$0.00	$0.68	$0.00	$0.00	$28.84	$41.48
Painter Sign Journeyman Tech/Team Leader Class D	$25.28	$1.70	$0.21	$0.00	$1.46	$0.00	$0.68	$0.00	$0.00	$29.33	$41.97
Sign Journeyman Class A	$25.00	$1.70	$0.21	$0.00	$0.00	$0.00	$0.67	$0.00	$0.00	$27.58	$40.08
Sign Journeyman Class B	$25.00	$1.70	$0.21	$0.00	$0.48	$0.00	$0.67	$0.00	$0.00	$28.06	$40.56
Sign Journeyman Class C	$25.00	$1.70	$0.21	$0.00	$0.96	$0.00	$0.67	$0.00	$0.00	$28.54	$41.04
Sign Journeyman Class D	$25.00	$1.70	$0.21	$0.00	$1.44	$0.00	$0.67	$0.00	$0.00	$29.02	$41.52
Tech Sign Fabrication/ Erector Class A	$19.67	$1.70	$0.21	$0.00	$0.00	$0.00	$0.53	$0.00	$0.00	$22.11	$31.95

Tech Sign Fabrication/ Erector Class B	$19.67	$1.70	$0.21	$0.00	$0.38	$0.00	$0.53	$0.00	$0.00	$22.49	$32.33
Tech Sign Fabrication/ Erector Class C	$19.67	$1.70	$0.21	$0.00	$0.76	$0.00	$0.53	$0.00	$0.00	$22.87	$32.71
Tech Sign Fabrication/ Erector Class D	$19.67	$1.70	$0.21	$0.00	$1.13	$0.00	$0.53	$0.00	$0.00	$23.24	$33.08

Special Calculation Note : Other is for paid holidays.

Ratio :

Jurisdiction (* denotes special jurisdictional note) :
ADAMS, ALLEN, AUGLAIZE, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GREENE, HAMILTON, HANCOCK, HARDIN, HENRY, HIGHLAND, HOLMES, HURON, JACKSON, KNOX, LICKING, LOGAN, LORAIN, LUCAS, MADISON, MAHONING, MARION, MERCER, MIAMI, MONTGOMERY, MORROW, MUSKINGUM, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PREBLE, PUTNAM, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, TRUMBULL, TUSCARAWAS, UNION, VAN WERT, WARREN, WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :
Class A: less that 1 year.
Class B: 1-3 years.
Class C; 3-10 years.
Class D: More than 10 years.

Prevailing Wage Rate
Skilled Crafts

Name of Union: Plumber Pipefitter Local 189

Change # : LCN01-2022sksLoc189

Craft : Plumber Pipefitter Effective Date : 10/05/2022 Last Posted : 10/05/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Plumber Pipefitter	$43.25		$10.39	$7.49	$1.20	$0.00	$7.76	$0.10	$0.00	$0.00	$70.19	$91.81
Heating Piping Refrigeration, Temperature Control, Air Conditioning Welder	$43.25		$10.39	$7.49	$1.20	$0.00	$7.76	$0.10	$0.00	$0.00	$70.19	$91.81
pprentice	**Percent**											
Apprentice												
1st Year	45.00	$19.46	$5.00	$0.00	$1.20	$0.00	$0.00	$0.10	$0.00	$0.00	$25.76	$35.49
2nd Year	50.02	$21.63	$10.39	$5.60	$1.20	$0.00	$0.00	$0.10	$0.00	$0.00	$38.92	$49.74
3rd Year	55.00	$23.79	$10.39	$5.60	$1.20	$0.00	$0.00	$0.10	$0.00	$0.00	$41.08	$52.97
4th Year	65.00	$28.11	$10.39	$5.60	$1.20	$0.00	$5.76	$0.10	$0.00	$0.00	$51.16	$65.22
5th Year	80.00	$34.60	$10.39	$5.60	$1.20	$0.00	$7.76	$0.10	$0.00	$0.00	$59.65	$76.95

Special Calculation Note : *Other is International Training

Ratio :

Employees-------Journeyman to Apprentice per Job
1) 1-0
2) 1-1
3) 2-1
4) 2-2
5) 3-2
6) 4-2
7) 4-3
8) 5-3
9) 6-3
10) 6-4
11) 7-4
12) 8-4
13) 8-5

Jurisdiction (* denotes special jurisdictional note) :

DELAWARE, FAIRFIELD, FRANKLIN, HOCKING, LICKING, MADISON, MARION, PERRY, PICKAWAY, ROSS, UNION

14) 9-5
15) 10-5
16) 10-6
17) 11-6
18) 12-6
19) 12-7
20) 13-7
21) 14-7
22) 14-8
23) 15-8
24) 16-8
25) 16-9

Heating Piping refrigeration,Temperature Control,Air Conditioning Ratio
(1) Additional Apprentice to (3) Journeymen thereafter
Employees Journeyman to Apprentice
per Job

1) Employee 1-0
2) Employees 1-1
3) Employees 2-1
4) Employees 2-2
5)Employees 3-2
6) Employees 4-2
7) Employees 5-2
8) Employees 5-3
9) Employees 6-3
10)Employees 7-3
11)Employees 8-3
12)Employees 8-4
13)Employees 9-4
14)Employees 10-4
15)Employees 11-4
16) Employees 11-5
17) Employees 12-5
18) Employees 13-5
19) Employees 14-5
20)Employees 14-6
21)Employees 15-6
22)Employees 17-5
23)Employees 18-5
24)Employees 18-6
25)Employees 19-6
26)Employees 20-6
28)Employees 22-6
29)Employees 22-7
30) Employees 23-7
31)Employees 23-7
32) Employees 25-7
33)Employees 26-7
34)Employees 26-8

Special Jurisdictional Note :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Sheet Metal Local 24 Columbus

Change # : LCN01-2022sksLoc24Col

Craft : Sheet Metal Worker Effective Date : 08/12/2022 Last Posted : 08/12/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Sheet Metal Worker	$33.53		$9.55	$12.28	$1.06	$0.00	$3.82	$0.00	$0.00	$0.00	$60.24	$77.00
Apprentice	**Percent**											
1 st Year A	50.02	$16.77	$7.82	$1.88	$0.85	$0.00	$0.00	$0.00	$0.00	$0.00	$27.32	$35.71
1st Year B	55.00	$18.44	$7.82	$2.07	$0.85	$0.00	$0.00	$0.00	$0.00	$0.00	$29.18	$38.40
2nd Year A	60.00	$20.12	$8.89	$7.80	$0.85	$0.00	$0.00	$0.00	$0.00	$0.00	$37.66	$47.72
2nd Year B	65.02	$21.80	$8.95	$7.98	$0.85	$0.00	$0.00	$0.00	$0.00	$0.00	$39.58	$50.48
3rd Year A	70.00	$23.47	$9.10	$8.59	$1.06	$0.00	$2.67	$0.00	$0.00	$0.00	$44.89	$56.63
3rd Year B	75.00	$25.15	$9.17	$9.21	$1.06	$0.00	$2.87	$0.00	$0.00	$0.00	$47.46	$60.03
4th Year A	80.00	$26.82	$9.25	$9.83	$1.06	$0.00	$3.06	$0.00	$0.00	$0.00	$50.02	$63.44
4th Year B	85.00	$28.50	$9.32	$10.44	$1.06	$0.00	$3.25	$0.00	$0.00	$0.00	$52.57	$66.82

Special Calculation Note : No special calculations for this skilled craft wage rate required at this time.

Ratio :

1 Journeyman to 1 Apprentice
2-8 Journeymen to 2 Apprentices
9-11 Journeymen to 3 Apprentices
12-14 Journeymen to 4 Apprentices
15-17 Journeymen to 5 Apprentices
18-20 Journeymen to 6 Apprentices
21-23 Journeyman to 7 Apprentices
24-26 Journeyman to 8 Apprentices
27-29 Journeymen to 9 Apprentices
30-32 Journeymen to 10 Apprentices
33-35 Journeymen to 11 Apprentices
36-38 Journeymen to 12 Apprentices
39-41 Journeymen to 13 Apprentices
42-44 Journeymen to 14 Apprentices
45-47 Journeymen to 15 Apprentices
48-50 Journeymen to 16 Apprentices
and so on

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ATHENS, DELAWARE, FAIRFIELD, FAYETTE, FRANKLIN, GALLIA, GUERNSEY, HOCKING, JACKSON, KNOX, LAWRENCE, LICKING, MADISON, MARION, MEIGS, MORGAN, MORROW, MUSKINGUM, NOBLE, PERRY, PICKAWAY, PIKE, ROSS, SCIOTO, UNION, VINTON

Special Jurisdictional Note :

Details :

Prevailing Wage Rate
Skilled Crafts

Name of Union: Sprinkler Fitter Local 669

Change # : LCN01-2022sksLoc669

Craft : Sprinkler Fitter Effective Date : 04/06/2022 Last Posted : 04/06/2022

	BHR		Fringe Benefit Payments						Irrevocable Fund		Total PWR	Overtime Rate
			H&W	Pension	App Tr.	Vac.	Annuity	Other	LECET (*)	MISC (*)		
Classification												
Sprinkler Fitter	$43.75		$10.99	$7.10	$0.52	$0.00	$5.12	$0.00	$0.00	$0.00	$67.48	$89.35
Apprentice Indentured after April 1, 2013	Percent											
CILASS 1	45.00	$19.69	$7.85	$0.00	$0.52	$0.00	$0.00	$0.00	$0.00	$0.00	$28.06	$37.90
CLASS 2	50.02	$21.88	$7.85	$0.00	$0.52	$0.00	$0.00	$0.00	$0.00	$0.00	$30.25	$41.20
CLASS 3	54.43	$23.81	$10.99	$7.10	$0.52	$0.00	$1.15	$0.00	$0.00	$0.00	$43.57	$55.48
CLASS 4	59.43	$26.00	$10.99	$7.10	$0.52	$0.00	$1.15	$0.00	$0.00	$0.00	$45.76	$58.76
CLASS 5	64.43	$28.19	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$48.20	$62.29
CLASS 6	69.43	$30.38	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$50.39	$65.57
CLASS 7	74.43	$32.56	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$52.57	$68.85
CLASS 8	79.42	$34.75	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$54.76	$72.13
CLASS 9	84.43	$36.94	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$56.95	$75.42
CLASS 10	89.44	$39.13	$10.99	$7.10	$0.52	$0.00	$1.40	$0.00	$0.00	$0.00	$59.14	$78.70

Special Calculation Note :

Ratio :

1 Journeyman to 1 Apprentice

Jurisdiction (* denotes special jurisdictional note) :

ADAMS, ALLEN, ASHLAND, ASHTABULA, ATHENS, AUGLAIZE, BELMONT, BROWN, BUTLER, CARROLL, CHAMPAIGN, CLARK, CLERMONT, CLINTON, COLUMBIANA, COSHOCTON, CRAWFORD, DARKE, DEFIANCE, DELAWARE, ERIE, FAIRFIELD, FAYETTE, FRANKLIN, FULTON, GALLIA, GREENE, GUERNSEY, HAMILTON, HANCOCK, HARDIN, HARRISON, HENRY, HIGHLAND, HOCKING, HOLMES, HURON, JACKSON, JEFFERSON, KNOX, LAWRENCE, LICKING, LOGAN, LUCAS, MADISON, MAHONING, MARION, MEDINA, MEIGS, MERCER, MIAMI, MONROE, MONTGOMERY, MORGAN, MORROW,

MUSKINGUM, NOBLE, OTTAWA, PAULDING, PERRY, PICKAWAY, PIKE, PORTAGE, PREBLE, PUTNAM, RICHLAND, ROSS, SANDUSKY, SCIOTO, SENECA, SHELBY, STARK, SUMMIT, TRUMBULL, TUSCARAWAS, UNION, VAN WERT, VINTON, WARREN, WASHINGTON, WAYNE, WILLIAMS, WOOD, WYANDOT

Special Jurisdictional Note :

Details :

Sprinkler Fitter work shall consist of the installation,dismantling,maintenance,repairs,adjustments,and corrections of all fire protection and fire control systems including the unloading,handling by hand,power equipment and installation of all piping or tubing,appurtenances and equipment pertaining thereto,including both overhead and underground water mains,fire hydrants and hydrant mains,standpipes and hose connections to sprinkler systems used in connection with sprinkler and alarm systems. Also all tanks and pumps connected thereto,also included shall be CO-2 and Cardox Systems, Dry Chemical Systems,Foam Systems and all other fire protection systems.

PREVAILING WAGE THRESHOLD LEVELS
IMPORTANT NOTICE

Before advertising for bids, contracting, or undertaking construction with its own forces, to construct a public improvement, the Public Authority shall have the Ohio Department of Commerce-Division of Industrial Compliance, Bureau of Wage and Hour Administration determine the prevailing rates of wages for workers employed on the public improvement. The wage determination must be included in the project specifications and printed on the bidding blanks where work is done by contract.

"New" construction threshold for *Building* Construction:	**$250,000**
"Reconstruction, enlargement, alteration, repair, remodeling, renovation, or painting" threshold level for *Building* Construction:	**$75,000**

As of January 1, 2022:

"New" construction that involves *roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction* threshold level has been adjusted to:	**$96,091**
"Reconstruction, enlargement, alteration, repair, remodeling, renovation, or painting" that involves *roads, streets, alleys, sewers, ditches and other works connected to road or bridge construction* threshold level has been adjusted to:	**$28,789**

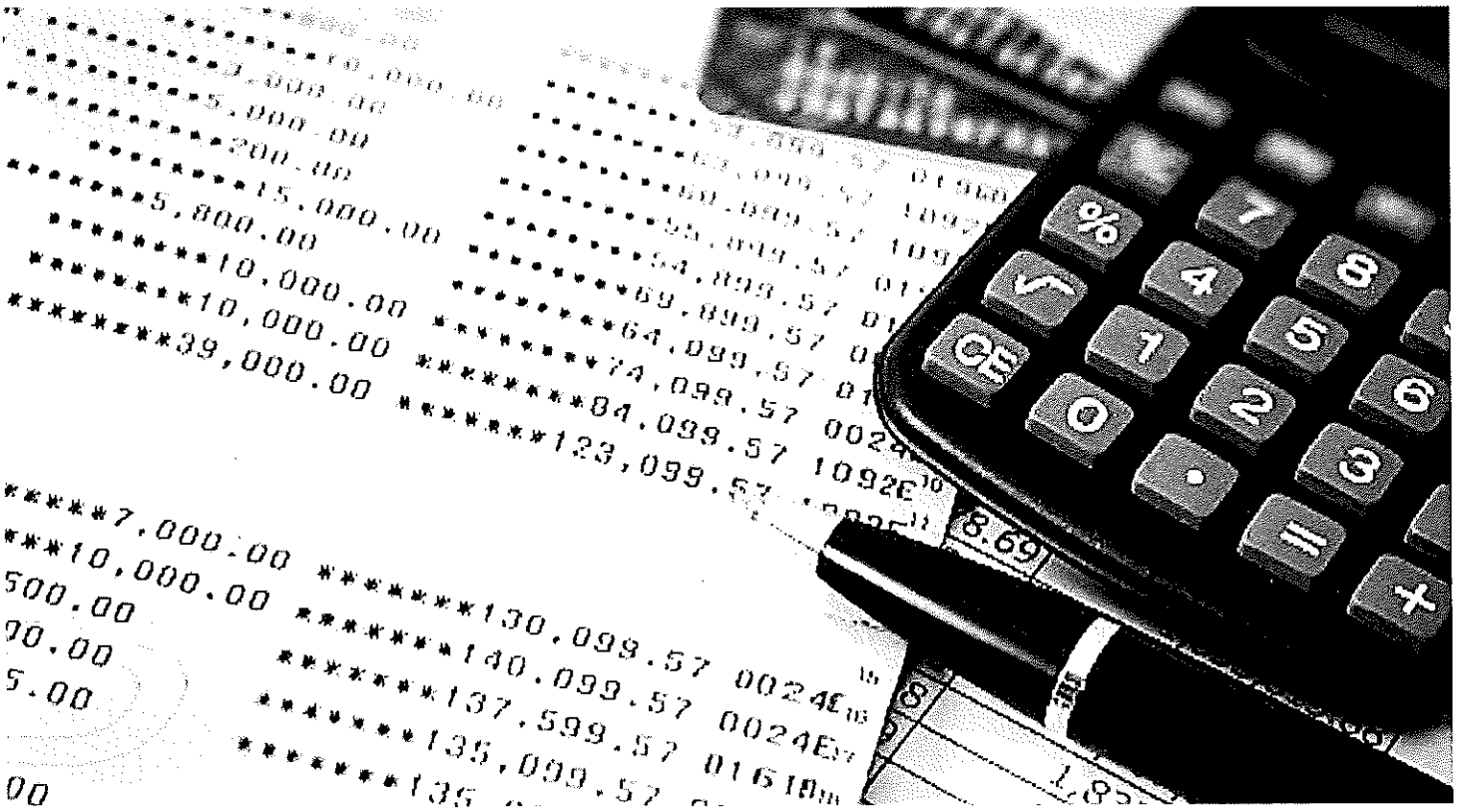
A) Thresholds are to be adjusted biennially by the Director of the Ohio Department of Commerce.
B) Biennial adjustments to threshold levels are made according to the Building Cost for Skilled Labor Index published by McGraw-Hill's Engineering News-Record, but may not increase or decrease more than 3% for any year.

If there are questions concerning this notification, please contact:

Ohio Department of Commerce
Division of Industrial Compliance
Bureau of Wage and Hour Administration
6606 Tussing Road, PO Box 4009
Reynoldsburg, Ohio 43068-9009
Phone: 614-644-2239
Fax: 614-728-8639
www.com.ohio.gov

Ohio.gov | Department of Commerce

Preparing Certified Payroll Reports



Expand All Sections

General

Contractors and subcontractors are required by law to submit certified payroll reports for work on projects covered by Ohio's Prevailing Wage Law. This form meets the reporting requirements established by Ohio Revised Code Chapter 4115.

Note: The use of this particular form is not mandatory, employers may submit their own forms that are approved by the public authority contracting for the project, provided that all of the required information is included.

Certified Payroll Heading

- **Employer name and address:** Company's full name and address. Indicate if the company is a subcontractor, if so list the name of the General or Prime.
- **Project:** Name and location of the project, including county.
- **Contracting Public Authority:** Name and address of the contracting public authority.
- **Week Ending:** Month, day, and year for last day of reporting period.
- **Payroll # :** Indicates first, second, third, etc. payroll filed by the company for the project.
- **Page indicator:** number of pages included in the report.
- **Project Number:** Determined by the public authority. If there is no number leave blank.

Information by Column

1. **Employee Name, Address and Social Security number:** This information must be provided for all employees that perform physical labor on the project. Corporate officers, partners, and salaried employees are considered employees and must be paid the prevailing rate. Individual sole proprietors do not have to pay themselves prevailing rate but must report their hours on the project.
2. **Work Class:** List classification of work actually performed by employee. If unsure of work classification, consult the Ohio department of Commerce, Wage and Hour Bureau. Employees working more than one classification should have separate line entries for each classification. Indicate what year/level for Apprentices. Be specific when using laborer and operator classifications; for example, Backhoe Operator or Asphalt Laborer.
3. **Hours Worked, Day & Date:** In the first row of column 3 enter days of pay period example; M T W TH F S S. The second row is for the date that corresponds with each day for the pay period. In the employee information section enter the number of hours worked on the prevailing wage project and which day the hours were worked. Separate rows are labeled for (ST) straight time hours and (OT) overtime hours. All hours worked after 40, must be paid at the appropriate overtime rate.
4. **Project Total Hours:** Total the hours entered for pay period.
5. **Base Rate:** Enter actual rate per hour paid to the employee. The overtime hourly rate is time and one-half the base rate listed in the prevailing wage schedule plus fringe benefits at straight time rate. The prevailing wage schedule lists the base rate plus fringe benefit amounts. These

amounts added together equal the total prevailing wage rate. Employers must pay this total amount in one of three ways.

- Total rate may be paid in entirety in the base rate to the employee; in which case, the cash designation will be checked for fringe benefits.
- Total rate may be paid as listed in prevailing wage rate schedule with total fringe amounts paid approved plans.
- Total rate may be paid with a combination of base rate and fringe payments to approved plans in amounts other than those listed in schedule.

6. **Project Gross:** Enter total gross wages earned on the project for straight time and overtime. Project hours X base rate should equal project gross.

7. **Fringes:** If fringe benefits are paid in the hourly base rate, indicate this by marking the cash space. If fringe benefits are paid to approved plans as listed in the prevailing wage rate schedule, mark the space Approved Plans. If fringe benefits are paid partially in the base rate and partially to approved plans, mark the space Cash & Approved plans. List the hourly amount paid to approved plans for each fringe. If payments are not made on a per hour basis, calculate the hourly fringe credit by dividing the yearly employer contribution by the lesser of: hours actually worked in the year (these must be documented) or 2080. Fringe benefits include: Employer\\'s share of health insurance, life insurance, retirement plan, bonus/profit sharing, sick pay, holiday pay, personal leave, vacation, and education/training programs.

8. **Total Hours All Jobs:** Total all hours worked during the pay period including non-prevailing wage jobs.

9. **Total Gross All Jobs:** Gross amount earned in the pay period for all hours worked.

10. Self explanatory.

11. Self explanatory.

12. Self explanatory.

Certified Payroll Report

Report for:

Company:[1] _____

Address: _____

City, State, Zip _____

Phone No: _____

☐ Check if Subcontractor[1]

If Sub, GC/Prime Contractor Name: _____

Public Authority (Owner): _____

Contract No: _____

Project Name & Location: _____

Payroll No: _____

Week Ending: _____

Sheet:[2] _____ of _____

1. Employee Name, Address, & SS# (Last 4 digits if permitted)	2.Work Class[3]	3.Prevailing Wage Project Hours Worked - Day & Date							4.Total Hours	5.Base Rate	6.Project Gross	7. Fringes: ☐ Cash ☐ Approved Plans ☐ Cash & Approved Plans						Weekly Payroll Amount			
												Fringe Rate Your Company Pays Per Hour						8.Total Hrs for all Jobs	9. Total Gross on All Jobs	10. Total Deductions	11. Net Pay on All Jobs
												H&W	Pens	Vac	Hol	Other	Total				
		OT																			
		ST																			
		OT																			
		ST																			
		OT																			
		ST																			
		OT																			
		ST																			
		OT																			
		ST																			

1) By signing below, I certify 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 permissable deductions as defined in ORC Chapter 4115; and (5) apprentices are registered with the U.S. Dept. 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 or criminal prosecution.

Type or Print Name and Title _____ Signature _____ Date _____

11/14 jc

[2]Attach additional sheets as necessary. [3]Type in continuous line, text will wrap.

Ohio | Department of Commerce

Division of Industrial Compliance

Affidavit of Compliance

Prevailing Wages

I, _____
(Name of person signing affidavit) (Title)

do hereby certify that the wages paid to all employees of

_____
(Company Name)

for all hours worked on the

_____
(Project name and location)

project, during the period from _____ to _____ are in
(Project Dates)

compliance with prevailing wage requirements of Chapter 4115 of the Ohio Revised Code. I further certify that no rebates or deductions have been or will be made, directly or indirectly, from any wages paid in connection with this project, other than those provided by law.

_____
(Signature of Officer or Agent)

Sworn to and subscribed in my presence this _____ day of _____, 20_____.

_____ (Notary Public)

The above affidavit must be executed and sworn to by the officer or agent of the contractor or subcontractor who supervises the payment of employees. This affidavit must be submitted to the owner (public authority) before the surety is released or final payment due under the terms of the contract is made.

Bureau of Wage and Hour Administration
6606 Tussing Road
Reynoldsburg, OH 43068-9009
LAW1003
3/2019

614-644-2239
Fax 614-728-8639
TTY/TDD 800-750-0750
com.ohio.gov

SECTION 01 11 00 — SUMMARY OF WORK

PART 1 - GENERAL

1.1 PROJECT DESCRIPTION

A. The Work consists of the construction of a minor interior renovation to the existing library building. Interior renovations of the existing building are required as part of the Work.

1. The Work includes architectural woodwork, aluminum doors and frame, wood door and frame, hardware, glazing, interior finishes and furnishings including vertical blinds, fire protection, heating-ventilating-air conditioning, electrical systems, lighting, and communication-alarm-signal systems.

1.2 BREAKDOWN OF CONTRACTS

A. The Work is to be broken down under separate prime contracts as indicated on the Form of Proposal and as follows:

1. General Contract.
2. Fire Protection Contract.
3. HVAC Contract.
4. Electrical Contract.
5. Air Balancing Contract.

B. The Work is to be performed as a single Contract, including General, Plumbing, Fire Protection, Heating, Ventilating, Air Conditioning, and Electrical.

1.3 OWNER FURNISHED ITEMS

A. The Owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractor's Construction Schedule and will inspect deliveries for damage.

1. If Owner furnished items are damaged, defective, or missing, the Owner will arrange for replacement.
2. Contractor is responsible for designating delivery dates of Owner furnished items in the Construction Schedule. All Contractors are responsible for protecting Owner furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations.
3. Owner is responsible for receiving, unloading, and handling Owner furnished products at the site.

B. Contractor shall disconnect, relocate, reinstall, and reconnect the Owner’s existing equipment as designated in the Contract Documents.

1.4 WORK SEQUENCE

A. The work will be conducted in phases to provide the orderly execution of the work, to provide the least possible interference to the Owner's operations and to permit an orderly transfer of personnel and equipment to the remodeled space.

B. The Contractor shall develop, in close coordination with the Owner, a detailed phasing plan for execution of the work. The plan shall address the sequence of work and any time constraints regarding the time of day when work can be accomplished.

C. Upon Owner’s approval, the Contractor shall distribute and coordinate the plan with all subcontractors and keep them informed of any subsequent modifications.

D. If, in the Owner's judgment, it becomes necessary to accelerate or delay construction in specific areas of work, he shall relay this to the Contractor. The Contractor shall inform subcontractors of the phasing change and transfer workmen to such point as directed and execute portions of the work as required to accelerate completion.

1.5 CONTRACTOR USE OF PREMISES

A. General: Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.
   1. Confine operations to areas within Contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.
   2. Coordinate with the Owner access routes to work areas for construction personnel and materials.
   3. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.
   4. Do not dispose of organic and hazardous material on site, either by burial or by burning.
   5. Keep driveways and entrances serving the premises clear and available to the Owner and Owner's employees at all times. Do not use these areas for parking or storage of materials. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on site.

B. Notification: Notify Owner at least 48 hours before starting extensive work in occupied parts of the building, or when access to occupied buildings is required.

C. Each Contractor shall provide adequate protection for public, employees, and building occupants.
   1. The existing building will be occupied at all times and noise limitations, odor limitations, and extreme safety precautions will be required. Exercise caution in the execution of the work to create the least possible amount of disturbance to the public, employees, and occupants of the building. Use products and construction methods which comply with VOC requirements and create the least offensive odor.
   2. Use extreme care in providing adequate fire protection of existing building and equipment. When welding is being done, two 15 lb. extinguishers shall be readily available for protection.
      a. The use of flammable or explosive materials, solvents, and equipment within occupied areas is prohibited without previous notice of intent to Owner's representative. Each Contractor shall familiarize himself with building fire procedures and alarm box locations.
   3. The use of explosive fasteners is prohibited.
   4. Existing building exits shall be kept unobstructed at all times to permit emergency egress from building. At no time shall any required exit from the building be blocked or rendered inoperative without provisions made to provide suitable temporary alternate exits.

D. Take precautions necessary to protect building and its occupants during construction period. Repair damage caused by construction operations.
   1. Contractor's use of existing toilet rooms, telephones, and other building services is not permitted.
   2. Access to any building area in which there is no contract work is not permitted.
   3. Workmen shall not loiter or congregate in any part of the existing occupied building. When work is required to be performed in occupied portions of the building, workmen shall proceed to that part of the building by the most direct means without interfering with routine procedures in the building.

E. Coordinate access to the site for vehicles, equipment and material storage areas with Owner's representative.

1. Provide protected access on construction site for trucks, automobiles, and pedestrian traffic to adjacent existing occupied buildings.

F. Pickerington Library is a smoke free facility. No smoking will be permitted within the existing building or the new addition.

1.6 INTERRUPTION OF EXISTING SERVICES

A. Interruption of existing services: Interruption, disconnection, reduction, or curtailment of any critical services, including those listed below shall not be undertaken without maximum prior notice (48 hours minimum) and cooperation with Owner:
   1. Gas.
   2. Electricity.
   3. Water.
   4. Telephone.
   5. Fire Protection.
   6. Sewer.

B. Before severance of any critical service to any portion of Owner's buildings, Contractor shall submit to Architect and Owner a written plan stating the purpose and duration of the proposed interruption. Contractor shall not, under any circumstances, proceed with work of any type which may interfere with the Owner's everyday activities without the Owner's authorization. Downtime shall be performed at other than normal working hours. Overtime shall be included in the Base Bid Contract for these periods.

1.7 SALVAGED MATERIALS

A. Carefully remove, protect, and place in Owner’s storage all items designed by the construction documents for salvage or for relocation.

B. The Owner shall remove from the building those other items it wishes to salvage prior to the Contractor starting work in a given area.

C. Material and equipment remaining in place and not designated for salvage for relocation shall become the property of the Contractor and shall be removed from the site and legally disposed of by the Contractor.

1.8 OWNER OCCUPANCY

A. The Owner will occupy the site and existing building during the entire construction period. Cooperate with Owner during construction operations to minimize conflicts and facilitate Owner use of premises. Perform the work in a manner to not conflict with Owner's operations.

B. Partial Owner Occupancy: Owner reserves the right to occupy and to place and install equipment in completed areas of the building, before Substantial Completion provided occupancy does not interfere with completion of the Work. Placing of equipment and partial occupancy shall not constitute acceptance of the total Work.
   1. A Certificate of Substantial Completion will be executed for each specific portion of the Work to be occupied before Owner occupancy.
   2. Obtain a Certificate of Occupancy from local building officials prior to Owner occupancy.
   3. Before partial Owner occupancy, mechanical and electrical systems shall be fully operational. Required inspections and tests shall have been successfully completed. Refer to Section 01 50 00.

PART 2 - PRODUCTS

2.1 REFERENCE STANDARDS

A. Reference Standards: When references are made to various Association's industry standards, the edition in force at the date specifications are published shall apply unless specifically indicated otherwise.

PART 3 - EXECUTION

3.1 QUALITY OF WORK

A. All work performed under this contract shall be completed in compliance with good workmanship and acceptable standards of the applicable industry, as determined by Architect. Any installation not meeting these requirements will be corrected to Architect's satisfaction at the expense of the applicable Contractor. No extension of time will be granted for additional time required to replace or correct unacceptable work.

END OF SECTION 01 11 00

SECTION 01 21 00 — ALLOWANCES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements governing handling and processing allowances.

B. Selected materials, equipment, and in some cases, their installation are shown and specified in the Contract Documents by an allowance. Additional requirements will be issued by Change Order.

C. The Contractor shall include in his proposal the cash allowances stated in the Specifications. These allowances represent the net cost estimate of the materials delivered, unloaded at the site, applicable taxes, and Contractor's handling costs on the site. Overhead, profit and other expenses related to the cash allowance material shall be included in the Contract Sum. If the actual cost of the materials delivered, unloaded at the site, and all applicable taxes is more or less than the cash allowance estimates, the Contract Sum will be adjusted accordingly by Change Order.

1.2 SELECTION AND PURCHASE

A. At the earliest feasible date after Contract award, advise Architect of the date when final selection and purchase of each product or system described by an allowance must be completed in order to avoid delay in performance of the Work.

1.3 SUBMITTALS

A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

B. Submit invoices or delivery slips to indicate actual quantities of materials delivered to the site for use in fulfillment of each allowance.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Inspect products covered by an allowance promptly upon delivery for damage or defects.

3.2 PREPARATION

A. Coordinate materials and their installation for each allowance with related materials and installations to ensure each allowance item is completely integrated and interfaced with related construction activities.

3.3 ALLOWANCE SCHEDULE

A. Allowance No. 1: Provide a lump sum allowance of $5,000 to remove existing wood base and provide new wood base stained to match existing.

END OF SECTION 01 21 00

SECTION 01 25 00 — SUBSTITUTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. Bids shall be based on materials, equipment and systems required by the Contract Documents without exception.

B. The products specified in the Contract Documents establish a standard of required function, dimension, appearance, and quality.

C. Contractors wishing to obtain approval to bid non-specified products shall submit written requests to the Architect on the Product Approval Request Form included as an attachment to this Section a minimum of 10 work days before the bid date and hour.

1. Each Product Approval Request Form shall include the name of the specified manufacturer and product and a complete description of the proposed product including manufacturer's name and model number or system proposed, drawings, product literature, performance and test data, color selections or limitations, and any other information necessary for evaluation. Include a statement indicating any changes in other materials, equipment, or other work that would be required if the proposed product is incorporated in the work. The burden of proof of the merit of the proposed product is on the proposer. The Architect's decision of approval of a proposed product will be final.
2. The following will be cause for rejection of a Product Approval Request Form:
   a. Requests submitted by suppliers and individuals other than prime contractors.
   b. Requests submitted without adequate documentation.
   c. Requests submitted without the specified Product Approval Request Form.
   d. Requests received after the specified cut-off date.
3. When the Architect approves a product submission before receipt of bids, the approval will be included in an Addendum and bidders may include the pricing of this product in their proposal. Bidders shall not rely on approvals made in any other manner.

D. Specifications are generally written using the following methods:

1. Performance: Where products are identified only by standard performance criteria and reference standards such as Federal Specifications or ASTM numbers, Contractor may bid any item conforming to the material, performance, and specification criteria indicated.
2. Manufacturer Listing: Where specifications specify more than one manufacturer for a product or material, the first manufacturer listed indicates the product or material used as the basis for project design. Using one of the other specified manufacturers or products does not relieve the Contractor of the responsibility of the product or material meeting specified requirements. If one of the other listed manufacturers is selected for use by the Contractor for the project, the Contractor shall certify the product meets specified requirements, and its performance, operation, size, finish, warranty, accessories, and other specified qualities are equivalent or superior to the specified product, as determined by the Architect.
3. Proprietary: Where specifications specify only one particular manufacturer's product, that product is the basis of the contract without exception.

E. Related Sections:

1. Subcontractor’s and supplier’s list – Ref: 01 33 00.
2. Contract closeout submittals- Ref: Section 01 70 00.

1.2 DEFINITIONS

A. Products: The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

B. Substitutions: Changes in materials, equipment, and systems from those required by the Contract Documents and proposed by subcontractor.

1.3 SUBMITTALS

A. Substitution Requests: Submit three copies of each request for consideration.
   1. Substitution Request Form: Use Product Approval Request Form provided at end of Section.
   2. Documentation: Show compliance with requirements for substitutions.

PART 2 - PRODUCTS

2.1 PRODUCT SUBSTITUTIONS

A. Timing: No substitutions will be considered after the Contract award.

B. Conditions: Architect will consider subcontractor'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 offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
   2. Requested substitution does not require extensive revisions to the Contract Documents.
   3. Requested substitution is consistent with the Contract Documents, meets specified requirements, and will produce indicated results.
   4. Substitution request is fully documented and properly submitted.
   5. Requested substitution will not adversely affect Contractor's Construction Schedule.
   6. Requested substitution has received necessary approvals of authorities having jurisdiction.
   7. Requested substitution is compatible with other portions of the Work.
   8. Requested substitution has been coordinated with other portions of the Work.
   9. Requested substitution provides specified warranty.
   10. If requested substitution involves more than one subcontractor, 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 subcontractors involved.

PART 3 - EXECUTION (NOT USED)

END OF SECTION 01 25 00

DESIGNGROUP

PRODUCT APPROVAL REQUEST FORM

TO: Nikki Wildman, Project Architect

Design Group Inc.
515 East Main Street
Columbus, OH 43215

PROJECT: Pickerington Public Library Barn/Youth Services Renovation

Comm. No.: 22030.00
Date: _____

Product Approval Request Philosophy: To provide appropriate materials, products, and systems that, in the best interest of the Owner, are compatible with the design philosophy and budget established for the project.

Requirements and guidelines for standards/substitutions are indicated in Section 01 25 00.

THE FOLLOWING REQUEST FORM SHALL BE FILLED OUT COMPLETELY, CLEARLY, AND CONCISELY OR IT WILL NOT BE REVIEWED.

SPECIFIED MANUFACTURER AND PRODUCT ITEM:_____
_____ Section _____ Page _____ Paragraph _____

The undersigned requests consideration of the following manufacturer and product. Clearly indicate model number or system proposed:

PROPOSED MANUFACTURER AND PRODUCT ITEM: _____
_____.

REASON FOR REQUEST: _____
_____.

The attached technical data includes product description, specifications, and drawings with applicable portions of the data identified for evaluation of the product approval request. Include, when appropriate or when requested by Architect, samples, photographs, and performance and test data, to fully describe proposed product. Attached data also includes a description of changes to the Contract Documents required for the proper installation of the proposed product. **If technical data is not attached, the proposed manufacturer and product will be rejected due to insufficient information available for evaluation**.

In order to expedite comparison and evaluation, the submitter shall compare the proposed product on a line-by-line basis to the specified requirements. Reference section article numbers and paragraphs.

Submitter shall respond to the following questions. Provide appropriate substantiating data for evaluation.

YES	NO	ATTACHMENT	
☐	☐	☐	Is product represented locally? Supplier/Representative: _____
☐	☐	☐	Is an approved installer required?
☐	☐	☐	Are approved installer(s) available locally? Approved Installer(s):_____
		☐	Provide an attachment that lists a minimum of three similar projects completed by each installer. Include Owner's contact name and telephone number.
☐	☐	☐	Is the submitted product equivalent to the specified item?
☐	☐	☐	Does it have the same dimensions? (Thickness, gage, etc.)(Include attachment documenting compliance.)
☐	☐	☐	Does it have the same appearance?

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PRODUCT APPROVAL REQUEST FORM

☐	☐	☐	Does it comply with the same quality standards listed? (LEED, ANSI, ASME, etc.) (Include attachment documenting compliance).
☐	☐	☐	Does it have similar color selections available as specified product? (Include attachment showing complete range of colors available. Identify costs and lead time related to standard, custom, and premium colors).
☐	☐	☐	Where has the proposed product been used locally? Location: _____
☐	☐	☐	Does the proposed product affect construction details?
☐	☐	☐	Is construction time affected?
☐	☐	☐	Is proposed product warranty equal to specified warranty? (Include attachment documenting warranty).
☐	☐	☐	Does proposed product manufacturer have a record of standing behind its product and warranty? (Include attachment documenting examples.)

The undersigned certifies the following statements are correct, unless specifically noted on the attachments:

1. The proposed product does not affect dimensions shown on the Drawings.
2. The undersigned will pay for changes to the building design, including architectural and engineering design, detailing, and construction costs caused by the proposed product.
3. The proposed product meets specified requirements.
4. The proposed product will have no adverse effect on other trades, the construction schedule, or specified warranty requirements.
5. Maintenance and service parts will be locally available for the proposed product.

The undersigned further states that the function, appearance, and quality of the proposed product are equivalent or superior to the specified item.

Submitted by: _____

Signature: _____

Typed Name: _____

Firm: _____

Address: _____

_____

Telephone: _____

Attachments (List): _____

_____

_____

END OF DOCUMENT

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SECTION 01 31 19 — PROJECT MEETINGS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for project meetings including but not limited to:
   1. Pre-Construction Meeting.
   2. Pre-Installation Conferences.
   3. Progress Meetings.

B. Related Sections:
   1. Construction Schedule - Ref: Section 01 31 19.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 PRE-CONSTRUCTION MEETING

A. General Contractor: Schedule a pre-construction conference and organizational meeting at the Project Site or other convenient location no later than 15 days after execution of the Agreement and before start of construction activities. Conduct the meeting to review responsibilities and personnel assignments. Coordinate scheduling of pre-construction meeting with Owner and Architect.

B. Attendees: Owner, Architect and their consultants, Prime Contractors and their superintendents, major subcontractors, manufacturers, suppliers and other concerned parties shall each be represented at the meeting by persons familiar with and authorized to conclude matters relating to the Work.

C. Agenda: Discuss items of significance that could affect progress including such topics as:
   1. Tentative construction schedule.
   2. Critical work sequencing.
   3. Designation of responsible personnel.
   4. Procedures for processing field decisions and Change Orders.
   5. Procedures for processing Applications for Payment.
   6. Distribution of Contract Documents.
   7. Submittal of Shop Drawings, Product Data and Samples.
   8. Preparation of record documents.
   9. Use of the premises.
   10. Office, Work and storage areas.
   11. Equipment deliveries and priorities.
   12. Safety procedures.
   13. First aid.
   14. Security.
   15. Housekeeping.
   16. Working hours.

D. General Contractor: Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from the meeting.

3.2 PRE-INSTALLATION CONFERENCES

A. General Contractor: Conduct a pre-installation conference at the site before each construction activity that requires coordination with other construction. The 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 of scheduled meeting dates.

1. Review the progress of other construction activities and preparations for the particular activity under consideration at each pre-installation conference, including requirements for:
   a. Contract Documents.
   b. Options.
   c. Related Change Orders.
   d. Purchases
   e. Deliveries.
   f. Shop Drawings, Product Data and quality control Samples.
   g. Possible conflicts.
   h. Compatibility problems.
   i. Time schedules.
   j. Manufacturer's recommendations.
   k. Compatibility of materials.
   l. Acceptability of substrates.
   m. Space and access limitations.
   n. Governing regulations.
   o. Safety.
   p. Inspection and testing requirements.
   q. Required performance results.
   r. Recording requirements.
   s. Protection.
2. General Contractor: Record significant discussions and agreements and disagreements of each conference, along with the approved schedule. Promptly distribute meeting records to everyone concerned, including the Owner and Architect.
3. Do not proceed if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of Work and reconvene the conference at the earliest feasible date.

3.3 PROGRESS MEETINGS

A. General Contractor: Conduct weekly progress meetings at the Project site. Confirm scheduled meeting dates with Owner and Architect.

B. Attendees: In addition to representatives of Owner and Architect; each Prime Contractor, subcontractor, supplier or other entity concerned with current progress or involved in planning, coordination or performance of future activities shall be represented at these meetings by persons familiar with the Project and authorized to conclude matters relating to progress.

C. Agenda: Review and correct or approve minutes of the previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to the current status of the Project.

1. Contractor's Construction Schedule: Review progress since the last meeting. Determine where each activity is in relation to Contractor's Construction Schedule, whether on time or ahead or behind 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 current and subsequent activities will be completed within Contract Time.
2. Review the present and future needs of each entity present, including such items as:

a. Interface requirements.
b. Time.
c. Sequences.
d. Deliveries.
e. Off-site fabrication problems.
f. Access.
g. Site utilization.
h. Temporary facilities and services.
i. Hours of work.
j. Hazards and risks.
k. Housekeeping.
l. Quality and work standards.
m. Change Orders.
n. Documentation of information for payment requests.

D. General Contractor: No later than 5 days after each progress meeting date, distribute copies of minutes of the meeting to each party present and to other parties who should have been present.

1. Schedule Updating: Revise construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting, but not less than once a month.

E. Contractors may also conduct additional coordination meetings as necessary. Owner and Architect are not required to be present at these meetings.

END OF SECTION 01 31 19

SECTION 01 33 00 — SUBMITTALS

PART 1 - GENERAL

1.1 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. Manufacturer’s Safety Data Sheets (MSDS).
4. Shop Drawings.
5. Product Data.
6. Samples.
7. Color Schedule.
8. Quality Assurance.
9. Construction photographs.
10. List of subcontractors and suppliers.
11. Schedule of Values.
12. Daily construction reports.
13. Submittal procedure.
14. Architect's action on submittal review.
15. Notice of Furnishings.

B. Administrative Submittals: Refer to other Division 1 Sections and other Contract Documents for requirements for administrative submittals. Such submittals include, but are not limited to:

1. Permits.
2. Applications for payment.
3. Performance and payment bonds.
4. Release of Liens.
5. Insurance certificates.

C. Related Sections:

1. Project meeting notes - Ref: Section 01 31 19.
2. Quality control inspection and test reports - Ref: Section 01 45 00.
3. Project closeout record drawings, operating and maintenance manuals, and warranties - Ref: Section 01 70 00.

D. Drawings in Electronic Format: Drawing sheets will be issued in electronic format at the Contractor’s request for the sole purpose of coordination of work on this project and shall not be used for any other purpose without specific written approval by the Architect. The supplying of drawings in electronic format shall not change or alter the requirements of the Contract Documents or the responsibilities or liabilities of the Contractor.

1. Drawings in electronic format will be transmitted to the Contractor after Architect’s receipt of the signed agreement. Allow sufficient time for processing the request. Claims for delay due to insufficient processing time will not be considered.
2. Requests for drawings in electronic format from the Architect’s Consultants shall be directed to the Architect for processing.

3. The release of liability and indemnity agreement is available from the Architect upon request.

1.2 QUALITY ASSURANCE

A. Perform no Work requiring submittal and review of Shop Drawings, Product Data, Samples or similar submittals or order products or materials until the Shop Drawings, Product Data, Samples or similar submittals have been submitted to and approved by the Architect. Any Work started or products or materials ordered by the Contractor before final approval of the Shop Drawings, Product Data, Samples or other similar submittal by the Architect shall be performed or ordered by the Contractor under risk that no payment will be made for non-approved Work or product or material and the non-approved Work or product or material will be rejected.

PART 2 - PRODUCTS

2.1 CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: General Contractor shall prepare a fully developed, horizontal bar-chart type construction schedule. Each Prime Contractor shall submit scheduling information to the General Contractor within 14 days of award of Contract and before first Application for Payment to allow General Contractor time to fully develop Schedule.

1. Each Contractor shall be responsible for organizing, expediting, and scheduling his construction operations to provide sufficient and adequate labor, materials, and equipment necessary to execute his work and abide by the coordinated construction schedule to meet the contract completion date.

B. Distribution: Following response to initial submittal, General Contractor shall print and distribute copies to the Architect, Owner, each Prime Contractor, subcontractors, and other parties required to comply with scheduled dates. A copy shall be posted in the Project meeting room and temporary field office.

1. When revisions are made, distribution shall be made to the same parties and posted in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.
2. Submit three copies of the current Construction Schedule (revised monthly) with each Application for Payment. Failure to submit an updated, realistic, and accurate progress schedule will be sufficient cause for the Architect to decline the issuance of a Certificate for Payment.

2.2 SUBMITTAL SCHEDULE

A. Prime Contractors shall prepare and submit to Architect before first Application for Payment a proposed submittal schedule, including shop and setting drawings. The submittal schedule shall indicate anticipated dates submittals will be submitted for review and be coordinated with the Construction Schedule to permit a minimum two week time period for review and approval of each submittal by Architect and Project Engineers while allowing sufficient time for fabrication and shipment to maintain the Construction Schedule.

1. Prepare the schedule in chronological order. Provide the following information:
   a. Scheduled date for the first submittal.
   b. Related Section number.
   c. Submittal category.
   d. Name of subcontractor.
   e. Description of the part of the Work covered.
   f. Scheduled date for resubmittal, if anticipated.
   g. Scheduled date of Architect's final release or approval.

B. Schedule Updating: Revise schedule where revisions have been recognized or made. Issue the updated schedule information to Architect.

C. Large sets of shop drawings requiring more than two weeks for review must be specifically provided for in schedule. Avoid simultaneous submittals of multiple sets of shop drawings and other voluminous submittals. The submittal schedule is subject to review and approval of Architect and Project Engineers.

2.3 MANUFACTURER'S SAFETY DATA SHEETS (MSDS)

A. Manufacturer's Safety Data Sheets (MSDS) for all hazardous substances, materials, or products will be required to be on file before the items are brought onto the construction site. The Contractor is responsible for providing MSDS at least three working days before the material is brought on site and maintaining them at the construction site for use and reference by workers, government officials, and Owner's personnel. MSDS information is not considered a shop drawing or product submittal and will not be reviewed or stamped by the Architect for approval.

2.4 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. Include the following information:
   1. Dimensions.
   2. Identification of products and materials included.
   3. Compliance with specified standards.
   4. Notation of coordination requirements.
   5. Notation of dimensions established by field measurement.
   6. Submittal: Submit one original and one copy of all shop drawings on sheets at least 8-1/2 inches x 11 inches but no larger than 24 inches x 36 inches to the Architect.
      a. The Architect will mark up shop drawings electronically or scan copies of reviewed sheets and distribute an electronic copy to the Contractor and Project Engineer via email.
      b. The Contractor and Project Engineer are responsible for printing their own copy of the reviewed shop drawings.
   7. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.
      a. Do not proceed with installation until an approved copy of the shop drawings is in the installer's possession.
      b. Unmarked copies of shop drawings are prohibited.

2.5 PRODUCT DATA

A. Submit Product Data as required in various specification sections. Product Data submittals are comparable to Shop Drawings but are further defined as follows.

B. 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".

1. 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:
   a. Manufacturer's printed recommendations.
   b. Compliance with recognized trade association standards.
   c. Compliance with recognized testing agency standards.
   d. Application of testing agency labels and seals.
   e. Notation of dimension verified by field measurement.
   f. Notation of coordination requirements.
2. Do not submit Product Data until compliance with Contract Document requirements has been confirmed.
3. Submittal: Submit one original and one copy of all product data on sheets at least 8-1/2 inches x 11 inches but no larger than 24 inches x 36 inches to the Architect.
   a. The Architect will mark up shop drawings electronically or scan copies of reviewed sheets and distribute an electronic copy to the Contractor and Project Engineer via email.
   b. The Contractor and Project Engineer are responsible for printing their own copy of the reviewed product data.
4. Distribution: Furnish copies of final submittal to installers, subcontractors, suppliers, manufacturers, fabricators, and others required for performance of construction activities.
   a. Do not proceed with installation until an approved copy of the product data is in the installer’s possession.
   b. Unmarked copies of product data are prohibited.

2.6 SAMPLES

A. Submit Samples as required in various specification sections. Samples submittals are comparable to Shop Drawings but are further defined as follows.

B. 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 materials, color range sets, and swatches showing color, texture and pattern.
   1. 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:
      a. Generic description of the Sample.
      b. Sample source.
      c. Product name or name of manufacturer.
      d. Compliance with recognized standards.
      e. Availability and delivery time.
      f. Where variation in color, pattern, texture or other characteristics are inherent in the material or product represented, submit multiple units (not less than 3), that show approximate limits of the variations.
      g. Refer to other Specification Sections for Sample requirements illustrating workmanship, fabrication techniques, details or assembly, connections, operation and similar construction characteristics.

C. Submittals: Except for Samples illustrating assembly details, workmanship, fabrication techniques, connections, operation, and similar characteristics, submit 3 sets; one will be returned marked with the action taken.
   1. Maintain sets of Samples, as returned, at the Project site, for quality comparisons throughout the course of construction.

D. Distribution of Samples: Prepare and distribute additional sets to subcontractors, manufacturers, fabricators, suppliers, installers, and others as required for performance of the Work.

1. Field samples specified in individual Sections are special types of Samples. Field Samples are full-size examples erected on site to illustrate finishes, coatings, or finish materials and to establish the standard by which the Work will be judged.
    a. Comply with submittal requirements to the fullest extent possible. Process transmittal forms to provide a record of activity.

2.7 COLOR SCHEDULE

A. Colors identified in the Contract Documents are for bidding purposes only. Do not order products or start fabrication of any material based on identified colors until the Architect has reviewed and accepted Contractor assembled color, material and finish samples.

B. Contractor shall assemble colors, materials, and finish samples in one package and submit to Architect at one time. Architect will review submitted materials for completeness and compliance with the project's design intent.
    1. Coordinate procurement of colors, materials, and finish samples to ensure complete and timely delivery of submittal.
    2. Allow sufficient review time so purchasing, delivery, and installation of products and materials will not be delayed as a result of the time required to review the submitted samples.
        a. Allow a minimum of three weeks for review by the Architect and Owner. Additional review time will be required if processing is delayed because of an incomplete submittal.
        b. Contract Time will not be extended due to Contractor's failure to transmit color materials to the Architect in enough time to permit processing as specified.

2.8 QUALITY ASSURANCE SUBMITTALS

A. Submit quality control submittals, including design data, certifications, manufacturer's instructions, manufacturer's field reports, and other quality control submittals as required under other Sections of the Specifications.

B. Certifications: Where other Sections of the Specifications require certification that a product, material, or installation complies with specified requirements, submit a notarized certification from the manufacturer certifying compliance with specified requirements.
    1. Signature: Certification shall be signed by an officer of the manufacturer or other individual authorized to sign documents on behalf of the company.

C. Inspection and Test Reports: Requirements for submittal of inspection and test reports from independent testing agencies are specified in Section 01 45 00, Quality Control Services.

2.9 CONSTRUCTION PHOTOGRAPHS

A. Construction Photographs: Starting with the first day of construction and once a month until project is complete, construction photographs are required to demonstrate construction progress and to serve as a communication device when describing a given condition to others at a remote location.
    1. Photographs shall provide a factual representation of construction extent and existing conditions at the time the image is taken. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion using a normal lens.
    2. Submit photographs with Application and Certificate for Payment. Application and Certificate for Payment will not be processed without updated construction progress photographs.
    3. In addition to periodic recurring views, take photos of each of the following events:
        a. Completion of site clearing.
        b. Excavations in progress.
        c. Foundations in progress and upon completion.

d. Structural framing in progress and upon completion.
e. Enclosure of building, upon completion.
f. Final completion, minimum of 12 photographs.

B. Digital Photographs: Take a minimum of 12 images of site and construction using a digital camera with a minimum sensor resolution of 2 megapixels and provide images in JPEG file format of not less than 1600 x 1200 pixels.

1. Transmit digital photographs to Architect by email, CD-ROM or posting to a project web site.
2. JPEG files shall be dated indicating the date and time the image was taken. Brief, but descriptive, file names shall be given to the images. If the image requires additional description, the file's "Image Description" metadata tag shall be used for this purpose or provide a written description in a separate text document.

C. Contractor may take additional photographs or videotapes as desired to document existing conditions.

2.10 LIST OF SUPPLIERS AND SUBCONTRACTORS

A. Each Contractor selected for Contract Work shall submit a complete list of Subcontractors and Suppliers of major materials and equipment before first Application For Payment for Architect approval. Use of these materials and equipment will be binding on Contractor. List only one unless more than one occurs under heading, in which case specify, (example: Josam and American Standard, NOT Josam or American Standard). List specification section, item, manufacturer, and supplier or subcontractor. Forms are available from Architect.

2.11 SCHEDULE OF VALUES

A. Submit the Schedule of Values to the Architect for approval at the earliest possible date, but not less than 10 days before submittal of the first Application for Payment. Provide sub-schedules for the Schedule of Values to show values separately correlated to site, renovation of the existing building, and new construction.

1. When requested, submit additional data to substantiate submitted values.
2. Format of Schedule: Typewritten, submitted on AIA Document G702 Application and Certificate for Payment and AIA Document G703 Continuation Sheet.
   a. Use Table of Contents from the Project Manual as a basis for listing costs of work for Divisions 02 through 49 sections. Sections containing several different products or requiring different types of work shall be further subdivided to identify each major item. Indicate quantities of designated materials.
   b. Identify each line item with number and title as listed in Table of Contents.
3. Itemize separate line item costs for each of the following general cost items:
   a. General Conditions requirements, including bonds and insurance.
   b. Field supervision and layout.
   c. Temporary facilities and controls.
   d. Testing laboratory services.
4. Itemize separate line item costs for work required by each Section of the Project Manual.
5. Break down installed costs into:
   a. Delivered cost of product.
   b. Cost of labor for product installation.
6. Sum of total costs of all items listed in Schedule shall equal the total of the contract.

B. After review by Architect, revise and resubmit the Schedule of Values as required.

PART 3 - EXECUTION

3.1 SUBMITTAL PROCEDURES

A. 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.
    a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
3. Processing: Allow sufficient review time so installation will not be delayed as a result of the time required to process submittals, including time for resubmittals.
    a. Allow two weeks by the Architect and Project Engineers for initial review. Allow additional time if processing must be delayed to permit coordination with subsequent submittals. The Architect or Project Engineer will promptly advise the Contractor when a submittal being processed must be delayed for coordination.
    b. Allow two weeks for reprocessing each submittal.
    c. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect or Project Engineer sufficiently in advance of the Work to permit processing as specified.

B. 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. Include the following information on the label for processing and recording action taken.
    a. Project name.
    b. Architect's Project reference number.
    c. Date.
    d. Name and address of Architect.
    e. Name and address of Contractor.
    f. Name and address of subcontractor.
    g. Name and address of supplier.
    h. Name of manufacturer.
    i. Number and title of appropriate Specification Section.
    j. Drawing number and detail references, as appropriate.

C. Contractor shall indicate review and approval of shop drawings, product data, samples, and similar submittals by means of a stamp having signature and date lines.

1. Provide a space approximately 3 inches x 8-1/2 inches on each submittal for the review stamps of the Contractor, Architect, and Project Engineers to indicate review and approval markings and the action taken.
2. An imprint of the Contractor’s stamp, initialed and dated by the Contractor, shall be made in above space of the submitted shop drawings, on product data in a location which will not obscure the information, or on a tag used to identify samples and similar submittals.
3. Submittals which do not bear the imprint of the stamp, signed and dated by the Contractor, or which do not comply with the Contract Documents shall be returned to the Contractor, shipping charges collect, without the Architect's review.

D. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from Prime Contractor to Architect or Project Engineer. Submittals received from sources other than the Prime 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. Include Contractor's certification that information complies with Contract Document requirements.

E. Submittal Transmittals to Engineers: After initial review, the Contractors shall send submittals to Architect's Consultants directly as indicated below. Send copy of all submittal transmittals to Architect. Upon approval, Shop Drawings shall be forwarded to Architect's office by respective engineer, for forwarding to Contractor.

1. Send all other transmittals direct to Architect.

F. All submittals, including shop drawings, product data, certifications, samples, and other items specifically required in the specification Section, shall be submitted at one time for a unit of work.

3.2 ARCHITECT AND PROJECT ENGINEER'S ACTION

A. Action Stamp: Architect or Project Engineer will stamp each submittal with a uniform, self-explanatory action stamp. Stamp will be appropriately marked, as follows, to indicate the action taken:

1. "**Approved**": Where submittals are marked "Approved," that part of the Work covered by the submittal may proceed provided it complies with requirements of the Contract Documents; final acceptance will depend upon that compliance.
2. "**Approved as Noted**": When submittals are marked "Approved as Noted," that part of the Work covered by the submittal may proceed provided it complies with notations or corrections on the submittal and requirements of the Contract Documents; final acceptance will depend on that compliance.
3. "**Resubmit**": When submittal is marked "Resubmit," do not proceed with that part of the Work covered by the submittal, including purchasing, fabrication, delivery, or other activity. Revise or prepare a new submittal in accordance with the notations; resubmit without delay. Repeat if necessary to obtain a different action mark.
   a. Do not permit submittals marked "Resubmit" to be used at the Project site, or elsewhere where Work is in progress.

B. **Submittals requested by the Contract Documents for action and return** will be reviewed by the Architect or Project Engineer, marked to indicate the action taken, and returned promptly.

1. Compliance with specified characteristics is the Contractor's responsibility as indicated in Agreement Form.
2. Approval by Architect or Project Engineer does not relieve the Contractor of responsibility to comply with Contract requirements.

C. **Submittals requested primarily for information or record purposes**, special processing or other activity not requiring review by the Architect or Project Engineer will be retained by the Architect.

1. Compliance with specified characteristics is the Contractor's responsibility as indicated in Agreement Form.
2. Acceptance of information or record submittals by the Architect or Project Engineer does not relieve the Contractor of responsibility to comply with Contract requirements.

D. **Submittals made by the Contractor, which have not been requested by the Contract Documents**, will be returned to the Contractor without review by the Architect or Project Engineer and without notation on the submittals.

3.3 NOTICE OF FURNISHINGS

A. Submit a Notice of Furnishings as required by the lien laws of the State of Ohio.

END OF SECTION 01 33 00

DESIGNGROUP

ELECTRONIC FILE AGREEMENT
FILE LIST

Project: Pickerington Public Library Barn / Youth Services Renovation

Project No. 22030.00

This agreement by and between DesignGroup and the undersigned Contractor, Subcontractor, or Vendor ("Contractor") shall be effective after the review and signing of the following agreement:

1) DesignGroup is providing the electronic files listed on the following page(s).
2) The data contained on these electronic files are part of DesignGroup's Instruments of Service. DesignGroup is deemed the author of the drawings and data and shall retain all common law, statutory law, and other rights, including copyrights. The electronic files are being furnished solely for the Contractor's convenience in the Contractor's preparation of shop drawings for the referenced project and shall not be used by the Contractor or anyone else for any other purpose. Any other use will be at the Contractor's sole risk and without liability or legal exposure to DesignGroup.
3) These electronic files, as defined below, are not contract documents. Differences may exist between the electronic files and the hard-copy Contract Documents. DesignGroup makes no representation regarding the accuracy or completeness of these electronic files nor their compatibility with the Contractor's hardware or software.
   a) Computer Aided Drafting and Design (CAD) is the use of 2D vector based objects such as lines, arcs, circles, and text to draft individual plan sections, elevations and details of a building.
   b) Building Information Modeling (BIM) is a 3D model-based technology that uses one database for all elements and processes relating to the design, construction, and use of a building. It is a digital representation of physical and functional characteristics of a facility. As such, it serves as a shared knowledge resource for information about a facility forming a reliable basis for decisions during its life cycle from inception onward.
4) It is the Contractor's responsibility to verify the accuracy and completeness of these electronic files, check, confirm and coordinate all dimensions and conditions and comply fully with all requirements of the Architect's sealed hard-copy construction documents which take precedence over these electronic files.
5) The data contained within these electronic files shall not in any manner change or alter the requirements of the Contract Documents or the responsibilities or liabilities of the Contractor.
6) The Contractor agrees to waive, to the fullest extent permitted by law, any claim or cause of action of any nature against DesignGroup, its officers, directors, employees and consultants that may arise out of or in connection with the Contractor's use these electronic files.
7) The Contractor agrees, to the fullest extent permitted by law, to indemnify and hold DesignGroup, its officers, directors, employees and consultants harmless against all damages, liabilities or costs, including attorneys' fees and defense costs, arising out of or resulting from the Contractor's use of these electronic files.
8) Under no circumstances shall delivery of the electronic files for use by the Contractor be deemed a sale by DesignGroup, and DesignGroup makes no warranty, either express or implied, of merchantability or fitness for any purpose.

DesignGroup	Contractor
_____	_____
Signature	Signature
_____	_____
Name	Name
_____	_____
Title	Title
_____	_____
Date	Date

SECTION 01 45 00 — QUALITY CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for quality control services.

1. The Owner will contract with and pay one or more independent testing agencies to perform testing, inspection of construction materials, conditions, and procedures for conformance with the Contract Documents and related actions, including reports.
2. Quality control services do not include contract enforcement activities performed by Architect or Owner.

B. Inspection and testing services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with Contract Document requirements.

1. Specific quality control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
2. Specified inspections, test and related actions are not intended to limit the Contractor's quality control procedures that facilitate compliance with Contract Document requirements.
3. Requirements for Contractor to provide quality control services required by the Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.

C. Related Sections:

1. Plumbing – Ref: Division 22
2. Fire Protection – Ref: Division 21
3. HVAC testing and inspections - Ref: Division 23.
4. Electrical testing and inspections - Ref: Division 26.

1.2 PERFORMANCE REQUIREMENTS

A. Preconstruction Testing: Testing agency shall perform preconstruction testing for compliance with specified requirements for performance and test methods.

B. Contractor responsibilities include the following:

1. Contractor's construction materials, procedures and work shall be subject to specified testing procedures and shall be in conformance with the Contract Documents as verified by Testing Agency.
2. Provide test specimens and assemblies representative of proposed materials and construction. Provide sizes and configurations of assemblies to adequately demonstrate capability of product to comply with performance requirements.
3. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
4. Fabricate and install test assemblies using installers who will perform the same tasks for the project.
5. Testing and inspecting requested by the Contractor and not required by the Contract Documents are the Contractor’s responsibility.

C. Retesting: Contractor is responsible for retesting where results of required inspections, tests or similar services prove unsatisfactory and do not indicate compliance with Contract Document requirements, regardless of whether the original test was the Contractor's responsibility.

1. The cost of retesting construction revised or replaced by the Contractor is the Contractor's responsibility, when tests were performed on original construction. The Contract Sum will be adjusted by Change Order.

D. Associated Services: Cooperate with agencies performing required inspections, tests and similar services and provide reasonable auxiliary services as requested. Notify agency a minimum of 48 hours in advance of operations to permit assignment of personnel. Auxiliary services required include but are not limited to:

1. Provide access to the Work and furnish incidental labor and facilities necessary to facilitate inspections and tests.
2. Take adequate quantities of representative samples of materials that require testing or assist the agency taking samples.
3. Provide facilities for storage and curing of test samples as directed by the Testing Agency.
4. Provide agency with a preliminary design mix proposed for use for materials mixes that require control by the Testing Agency.
5. Security and protection of samples and test equipment at the Project site.

E. Testing Agency Duties: The independent Testing Agency engaged to perform inspections, sampling and testing of materials and construction specified shall cooperate with Owner, Architect and Contractors in performance of its duties and shall provide qualified personnel to perform required inspections and tests.

1. The agency shall deliver samples to testing laboratories.
2. The agency shall submit a certified written report for each test, inspection, and similar quality assurance service to the Architect.
3. The agency shall interpret tests and inspections and state in each report whether the tested and inspected work complies with or deviates from the Contract Documents.
4. The agency shall notify Architect and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
5. The agency is not authorized to release, revoke, alter or enlarge requirements of the Contract Documents, or approve or accept any portion of the Work.
6. The agency shall not perform any duties of the Contractor.
7. The agency shall assign the same personnel to the site for duration of the project.

F. The Contractor and each agency engaged to perform inspections, tests and similar services shall coordinate the sequence of activities to accommodate required services with a minimum of delay and cost to Contractor and Owner. In addition, Contractor and each agency shall coordinate activities to avoid the necessity of removing and replacing construction to accommodate inspections and tests.

1. General Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities. Notify testing agency a minimum of 24 hours before time when Work requires testing or inspection performed.

1.3 SUBMITTALS

A. Submit a copy of report of laboratory facilities inspection made by Materials Reference Laboratory of National Bureau of Standards during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.

B. Schedule of Tests and Inspections: Prepare schedule in tabular form and include the following:

1. Specification Section number and title.
2. Description of test and inspection.
3. Identification of applicable standards.

4. Identification of test and inspection methods.
5. Number of tests and inspections required.
6. Time schedule or time span for tests and inspections.
7. Entity responsible for performing tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality control service.
10. Distribute schedule as indicated for report submittals.

C. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to:
1. Date of issue.
2. Project title and project number.
3. Name, address and telephone number of Testing Agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making the inspection or test.
6. Designation of the Work and test method.
7. Identification of product and Specification Section.
8. Complete inspection or test data.
9. Test results and an interpretations of test results.
10. Ambient conditions at the time of sample-taking and testing.
11. Comments or professional opinion as to whether inspected or tested Work complies with Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting.

1.4 QUALITY ASSURANCE

A. Qualification for Service Agencies: An agency with the experience and capability to conduct testing and inspecting indicated, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
1. Each independent inspection and Testing Agency engaged on the Project shall be authorized by authorities having jurisdiction to operate in the State in which the Project is located.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 REPORTS

A. Testing Agency shall prepare reports of all testing and inspections performed.

B. Submit reports no later than 7 days following the test.

3.2 REPAIR AND PROTECTION

A. General: Upon completion of inspection, testing, sample-taking and similar services, repair damaged construction. Restore patched areas and extend restoration of substrates and finishes to eliminate deficiencies, including deficiencies in visual qualities of exposed finishes.

B. Protect construction exposed by or for quality control service activities and protect repaired construction.

C. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing or similar services.

END OF SECTION 01 45 00

SECTION 01 50 00 — TEMPORARY FACILITIES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies requirements for temporary services and facilities, including temporary utilities, temporary construction and support facilities, and temporary security and protection.

1. Any Contractor requiring temporary service facilities before it can be provided as specified, or whose requirements with respect to a particular service differ from the service specified, shall provide service as required to meet his needs, at his own expense and in a manner satisfactory to Architect.
2. Provide “lock out” tags for equipment or services temporarily taken out of service.
3. Maintain temporary facilities and keep in good operating condition for the entire construction period. Provide maintenance personnel necessary to perform this work. Maintenance time will include normal working hours for all trades and start up and shut down overtime as required.
4. Permanent building equipment and devices used for provisions of temporary hoisting, heating, power, light, water and sanitation shall be put in new condition immediately before final acceptance by Owner. Unless stated otherwise, the warranty for all equipment and devices listed above shall be for a period of one year following date of Substantial Completion.

B. Temporary utilities required include but are not limited to:

1. Temporary electric service for power and light.
2. Temporary lighting.
3. Existing electrical service.
4. Temporary water.

C. Temporary construction and support facilities required include but are not limited to:

1. Field Offices and Storage sheds.
2. Temporary sanitary facilities, including drinking water.
3. Temporary construction barriers.
4. Waste disposal services.
5. Temporary parking.
6. Project identification signs.

D. Security and protection facilities required include but are not limited to:

1. Temporary fire protection.
2. Barricades, warning signs, lights.

E. Related Sections:

1. Interruption of existing services - Ref: Section 01 11 00.
2. Access to site and existing building - Ref: Section 01 11 00.
3. Protection for public, employees, and occupants - Ref: Section 01 11 00.
4. Cutting and patching - Ref: Section 01 73 29.

1.2 QUALITY ASSURANCE

A. Regulations: Comply with all U.S. Department of Labor OSHA requirements, industry standards and applicable laws and regulations of authorities having jurisdiction, including but not limited to:

1. Building Code requirements.
2. Health and safety regulations.
3. Utility company regulations.
4. Police, Fire Department and Rescue Squad rules.
5. Environmental protection regulations.

B. Standards: Comply with NFPA Code 241, "Building Construction and Demolition Operations", ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition", and NECA Electrical Design Library "Temporary Electrical Facilities."
   1. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service in compliance with National Electric Code (NFPA 70).

C. Inspections: If required by local code officials, arrange for authorities having jurisdiction to inspect and test each temporary utility before use. Obtain required certifications and permits.

1.3 PROJECT CONDITIONS

A. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Take necessary fire prevention measures. Do not overload facilities or permit them to interfere with progress. Do not allow hazardous, dangerous or unsanitary conditions, or public nuisances to develop or persist on the site.

B. Install temporary work in a manner to not interfere with permanent construction. If interferences do occur, it shall be the Contractor's responsibility to make required changes to overcome the interference.

C. General Contractor shall restore all damaged off-site and on-site paved areas used for storage and by construction vehicles to conditions equal to or better than original.

D. Coordinate and cooperate with Owner in scheduling work and using spaces, including parking spaces and driveways.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Provide new materials; if acceptable to Architect, undamaged previously used materials in serviceable condition may be used. Provide materials suitable for use intended.

B. Lumber and Plywood: Comply with requirements in Section 06 10 00, Rough Carpentry.
   1. For job-built temporary shops and sheds within the construction area, provide UL labeled, fire treated lumber and plywood for framing, sheathing and siding.

C. Water: Provide potable water approved by local health authorities.

2.2 EQUIPMENT

A. General: Provide new equipment; if acceptable to Architect, undamaged, previously used equipment in serviceable condition may be used. Provide equipment suitable for use intended.

B. First Aid Supplies: Comply with governing regulations.

C. Fire Extinguishers: Provide hand-carried, portable UL-rated, class "A" fire extinguishers for temporary offices and similar spaces. In other locations provide hand-carried, portable, UL-rated, class "ABC" dry chemical extinguishers, or a combination of extinguishers of NFPA recommended classes for the exposures.

1. Comply with NFPA 10 and 241 for classification, extinguishing agent and size required by location and class of fire exposure.

2.3 EXISTING ELECTRICAL SERVICE

A. Electrical Contractor: Before disconnecting existing electrical service to any portion of the building, submit a plan to Owner and Architect stating method and duration of proposed interruption. Do not proceed with work of any type which may interfere with Owner's everyday activities without Owner's written authorization. Electrical service downtime shall be performed at other than normal working hours. Overtime shall be figured for these periods.

B. Where temporary electric is required in remodeled areas of the existing building, Contractors may use local outlets or temporary extensions from panels. Owner will pay the cost of electric power consumed.

2.4 TEMPORARY WATER

A. Existing water sources within building may be used for construction purposes.

B. Cost of water reasonably used for construction purposes will be paid for by Owner.

2.5 TEMPORARY HEAT

A. Heating Contractor:
   1. Maintain recommended temperature range for length of time required after materials installation.
      a. At all times during normal working hours, provide sufficient heat to maintain a temperature of not less than 50 degrees F.
      b. Maintain minimum 65 degrees F. 10 days before application of paint and interior finishes, casework, millwork, etc. and until Substantial Completion of work and occupancy by Owner.

B. Use of Permanent Systems:
   1. Heating Contractor: Prepare and make permanent heating system available to supply temporary heat. Be responsible for mechanical system operation including greasing, oiling, and other on-going maintenance required for proper system upkeep. Maintain temporary filters in all equipment to prevent accumulation of dirt and dust in coils, air housing, and ductwork.
   2. Immediately preceding Substantial Completion, replace temporary filters with new clean filters. Thoroughly clean coils and other equipment of dirt and dust on completion of work and before final inspection and acceptance. Clean out traps and devices, adjust valves and replace defective or damaged materials with new materials.

C. Cost of fuel consumed for temporary heat during construction period will be paid by Owner.

2.6 FIELD OFFICES AND STORAGE SHEDS

A. Temporary Offices: Space within the building is available for Contractors' use. Coordinate location with Owner.

B. Each Contractor: Maintain a copy of all permits, contract drawings, and project manual marked up-to-date with all revisions, addenda, change orders, and as-built drawings on file at the field office, available for use at all times.

2.7 TEMPORARY SANITARY FACILITIES, INCLUDING DRINKING WATER

A. Designated existing toilet facilities are available for use by Contractors during project work. Coordinate approved existing facility for use with Owner. General Contractor shall maintain designated toilet facilities, including supply of toilet paper, in conditions acceptable to Architect and Board of Health. Before project acceptance, clean toilet area thoroughly and restore damaged finishes to original condition in a manner acceptable to Architect.

B. Each Contractor shall provide his own drinking water.

2.8 TEMPORARY CONSTRUCTION BARRIERS AND FENCES

A. General Contractor: Provide temporary construction barriers for protection of construction in progress and when completed, from other construction operations and similar activities. Construction barriers shall be constructed of sound materials, properly braced, and maintained in a safe condition, meeting applicable local, state, and federal requirements, labor laws, regulations.

B. Tarpaulins: Provide waterproof, fire-resistant, UL labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures provide translucent nylon reinforced laminated polyethylene or polyvinyl chloride fire retardant tarpaulins.

C. Dustproof Barriers: Erect and maintain dustproof temporary barriers as required, and at locations directed by the Owner, to prevent construction dirt from entering occupied portions of existing building. Barrier materials of Contractor's choice, with doors and locks required.

D. Provide and maintain temporary railings, guards, runways, and similar constructions required for proper execution of the work of all trades to protect and secure the site from the public, and to allow the public safe access around the site.
   1. Exterior staging shall be provided by each Contractor as required for their work.

2.9 WASTE DISPOSAL SERVICES

A. General Contractor: Responsible to keep the entire project site in a clean and sanitary condition during the entire progress of the Work and shall post and take precautions to keep the site clean.
   1. Provide a dumpster or other trash container of adequate size for use by all Contractors. Rental and dump fees shall be paid by the General Contractor. Coordinate location with Owner.

B. If Sub Contractors do not clean up and dispose of their waste materials in a reasonable length of time, General Contractor will do the required work when directed in writing by Architect. Cost of the work will be charged to responsible Contractor.

C. General Contractor shall remove any unidentifiable debris as it accumulates.

D. After each Sub Contractor has removed debris during construction as specified, General Contractor shall perform remaining site and building clean-up. Final cleaning is specified in Section 01 70 00.

2.10 TEMPORARY PARKING

A. Parking:
   1. On-site parking areas are available for Contractors' use. Coordinate location with Owner.

2.11 WEATHER PROTECTION

A. Each Contractor is responsible for protecting his work and existing or adjacent property against weather and maintaining his work, materials, apparatus, and fixtures free from injury or damage during the construction period. Cover or protect work at the end of each day's work. Remove work damaged by failure to provide protection and provide new work meeting project requirements at Contractor's expense.

B. Refer to “Temporary Construction Barriers” for requirements of tarpaulins.

2.12 SHORING AND BRACING

A. Each Contractor: Provide temporary shoring and bracing required for safety and execution of the work. Remove temporary shoring and bracing when work is completed and support materials are no longer needed.

2.13 TEMPORARY FIRE PROTECTION

A. Temporary Fire Protection: General Contractor shall install and maintain temporary fire protection facilities of the types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 10 "Standard for Portable Fire Extinguishers," and NFPA 241 "Standard for Safeguarding Construction, Alterations and Demolition Operations."

1. Locate fire extinguishers where convenient and effective for their intended purpose, but not less than one extinguisher.
2. Store combustible materials in containers in fire-safe locations.
3. Maintain unobstructed access to fire extinguishers, fire hydrants, temporary fire protection facilities, and other access routes for fighting fires. Prohibit smoking in hazardous fire exposure areas.
4. Provide supervision of welding operations, combustion type temporary heating units, and similar sources of fire ignition.

B. General Contractor: Ensure ready access to existing fire protection standpipes and hydrants in the project area.

2.14 BARRICADES, WARNING SIGNS, AND LIGHTS

A. Each Contractor shall provide, maintain, and remove all barricades, warning lights, and other safety devices required for the security, protection, and safety of his work and employees as well as the public.

B. Comply with standards and code requirements for erection of structurally adequate barricades. Paint with appropriate colors, graphics and warning signs to inform Contractor's and Owner's personnel and the general public of hazards being protected against.

1. Provide lighting, including flashing red or amber lights, when required at barricades, railings, obstructions in streets, drives, or sidewalks adjacent to public walks or roadways.

C. General Contractor: Maintain safety barricades through construction process and remove when directed.

D. Each Contractor: Plan and conduct work operations so two-way traffic is maintain at all times on adjacent and on-site streets and drives. Furnish lights, signs, barricades, and watchmen necessary for safe flow of traffic, 24 hours daily.

E. Each Contractor: Comply with the United States Department of Labor, Williams-Steiger Occupational Safety and Health Act of 1970.

2.15 WATCHMAN SERVICES

A. Watchman service is not required for the project. Job security is the responsibility of each Contractor. If any Contractor desires watchman service, they shall provide the service at their own cost.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use qualified personnel for installation of temporary facilities. Locate facilities where they will serve the Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required.

B. Provide each facility ready for use when needed to avoid delay. Maintain and modify as required. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITIES INSTALLATION

A. General: Employ appropriate local utility company to install temporary service or connect to existing service. Where company provides only part of the service, Contractor shall provide remaining work with matching, compatible materials and equipment complying with the company's recommendations.

1. Arrange with the company and existing users for a time when service can be interrupted, where necessary, to make connections for temporary services. If required, this work shall be performed after normal working hours with no additional cost to the Owner.
2. Provide adequate capacity at each stage of construction. Before temporary utility availability, provide trucked-in services.
3. Obtain easements to bring temporary utilities to the site, where Owner's easements cannot be used for that purpose.

3.3 TEMPORARY CONSTRUCTION AND SUPPORT FACILITIES INSTALLATION

A. Locate field offices, storage sheds, sanitary facilities and other temporary construction and support facilities for easy access.

1. Maintain temporary construction and support facilities until near Substantial Completion. Remove before Substantial Completion, unless otherwise accepted by the Owner. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to the Owner.

B. Provide incombustible construction for offices, shops and sheds located within the construction area, or within 30 feet of building lines. Comply with requirements of NFPA 241.

3.4 OPERATION, TERMINATION AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. Limit availability of temporary facilities to essential and intended uses to minimize waste and abuse.

B. Maintenance: Maintain facilities in good operating condition until removal. Protect from damage by freezing temperatures and similar elements.

1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation and similar facilities on a 24-hour day basis where required to achieve indicated results and to avoid possibility of damage.
2. Protection: Prevent water filled piping from freezing. Maintain markers for underground lines. Protect from damage during excavation operations.

C. General Contractor: Keep surrounding streets and properties clear of mud and construction debris.

D. Termination and Removal: Unless Architect requests that it be maintained longer, remove each temporary facility when the need has ended, or when replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with the temporary facility. Repair damaged Work, clean exposed surfaces and replace construction that cannot be satisfactorily repaired.

1. Materials and facilities that constitute temporary facilities are property of the Contractor.
2. At Substantial Completion, clean and renovate permanent facilities that have been used during the construction period, including but not limited to:
   a. Replace air filters and clean inside of ductwork and housings.
   b. Replace significantly worn parts and parts that have been subject to unusual operating conditions.
   c. Replace lamps that are burned out or noticeably dimmed by substantial hours of use.

END OF SECTION 01 50 00

SECTION 01 61 19 — OHIO VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes VOC restrictions for product categories listed below under “Definitions”. Products of each category that are installed in the project must comply with Ohio Revised Code requirements.

1.2 DEFINITIONS

A. VOC Restricted Products:
   1. Adhesives, including gunnable, trowelable, liquid applied and aerosol adhesives.
   2. Sealer coatings.
   3. Paints, primers, sealers, and other decorative coatings.
   4. Form release and curing compounds.
   5. Sealants, including gunnable, trowelable, and liquid applied.

1.3 SUBMITTALS

A. Submit product data for each VOC restricted product required for the project showing compliance, except when another type of evidence of compliance is required.

B. Submit certification from each installer that either 1) no adhesives, joint sealants, paints, coatings, or composite wood or agrifiber products have been used in the installation of his products or 2) that such products used comply with these requirements.

1.4 QUALITY ASSURANCE

A. Testing Agency Qualifications: An independent firm specializing in performing testing and inspections of the type specified in this Section.

PART 2 - PRODUCTS

2.1 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in the Ohio Building Code.
   1. Evidence of Compliance: Laboratory test report showing product complies with VOC requirements. The report must include the laboratory's statement that the product meets the specified criteria.

B. VOC Content Limits: Limits are expressed in grams of VOC per liter of coating, thinned to the manufacturer's maximum recommendations and excluding water, exempt compounds, or colorant added to tint bases:
   1. Bituminous Roof Coatings: 300.
   2. Bituminous Roof Primers: 350.
   3. Bond Breakers: 350.
   4. Concrete Curing Compounds: 350.
   5. Dry Fog Coatings: 400.
   6. Faux Finishing: 350.
   7. Fire Retardants:

a. Clear: 650.
b. Opaque: 350.

8. Fire Resistive: 350.
9. Flat Coatings: 100.
10. Floor Coatings: 250.
11. Form Release: 250.
12. Graphics Arts Coatings (sign paints): 500.
13. High Temperature Coatings: 420.
14. Industrial Maintenance Coatings: 340.
    a. Zinc Rich Industrial Maintenance Coatings: 500.
15. Magnesite Cement Coatings: 450.
16. Mastic Texture: 300.
17. Lacquers:
    a. Clear Brushing Lacquers: 680.
    b. Clear and Semi-Transparent: 550.
    c. Opaque: 550.
18. Metallic Pigmented Coatings: 500.
19. Multi-Color Coatings: 250.
20. Non-Flat Coatings: 150.
    a. High Gloss: 250.
    b. Quick Dry Enamels: 250.
21. Pre-Treatment Wash Primers: 420.
22. Primers and Undercoaters: 200.
23. Specialty Primers: 350.
    a. Quick Dry: 200.
24. Roof Coatings: 250.
25. Rust Preventative Coatings: 400.
26. Sealers: 200.
    a. Sanding Sealants: 350.
    b. Quick Dry: 200.
27. Shellacs:
    a. Clear: 730.
    b. Opaque: 550.
28. Stains: 250.
    a. Opaque: 250.
    b. Semi-Transparent: 250.
    c. Clear: 250.
    d. Interior: 250.
    e. Exterior: 250.
29. Swimming Pool Coatings: 340.
30. Traffic Marking Coatings: 150.
31. Varnishes; Clear and Semi-Transparent: 350.
32. Varnish; Conjugated Oil: 450.
33. Waterproofing Sealers and Treatments: 250.

a. Concrete Masonry: 400.

34. Wood Preservatives:
    a. Below Ground: 350.
    b. Clear and Semi-Transparent: 350.
    c. Opaque: 350.
35. Zone Marking Coatings: 150.
36. Low Solids Coatings: 120.

PART 3 - EXECUTION

3.1 FIELD QUALITY CONTROL

A. The Owner reserves the right to reject non-compliant products, whether installed or not, and to require their removal and replacement with compliant products at no extra cost to the Owner.

END OF SECTION 01 61 19

SECTION 01 70 00 — PROJECT CLOSEOUT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies administrative and procedural requirements for project closeout, including but not limited to:

1. Inspection procedures for Substantial Completion and Final Completion.
2. Project record document submittal.
3. Operating and maintenance manual submittal.
4. Submittal of warranties.
5. Final cleaning.
6. Closeout requirements for specific construction activities are included in the appropriate Sections in Divisions 02 through 49.

1.2 SUBSTANTIAL COMPLETION

A. Preliminary Procedures: Before requesting inspection for certification of Substantial Completion, complete the following. List exceptions in the request.

1. Advise Owner of pending insurance change-over requirements.
2. Obtain and submit releases enabling the Owner unrestricted use of the Work and access to services and utilities; include occupancy permits, operating certificates and similar releases.
3. Make final change-over of permanent locks and transmit keys to Owner. Advise Owner's personnel of change-over in security provisions.
4. Discontinue or change over and remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.
5. Complete final clean up requirements, including touch-up painting. Touch-up and otherwise repair and restore marred exposed finishes.

B. Inspection Procedures: On receipt of a request for inspection, Architect will either proceed with inspection or advise Contractor of unfilled requirements. Architect will prepare the Certificate of Substantial Completion following inspection or advise Contractor of work that must be completed or corrected before the certificate will be issued.

1. When Contractor believes the Work is Substantially Complete, he shall notify the Architect in writing and accompany the letter with his Punch List of items to be completed and corrected before final completion. Architect will verify this list and then schedule with Contractor for inspection.
2. Architect and Consulting Engineers will inspect Work, verify Substantial Completion has been reached, and verify Contractor's Punch List or amend it. Verified or amended Punch List will be attached to Certificate of Substantial Completion.
3. If, in Architect's judgment, project cannot be considered Substantially Complete, he shall notify Contractor of item or items to be completed or corrected before Certificate of Substantial Completion can be issued.
4. If Contractor's Punch List is inadequate and an excessive number of items remain to be completed or corrected, the Work will not be considered Substantially Complete and the inspection terminated.
    a. Architect and Consulting Engineers will make only two inspections to determine Substantial Completion. If the Work is not Substantially Complete, successive inspections required will be charged to Contractor at the Architect's and Consulting Engineer's current billing rate, including mileage and travel time.

b. Payment to Architect may be withheld from Contractor's remaining payment due to compensate for this cost.

5. Results of the completed inspection will form the basis of requirements for final acceptance.

1.3 FINAL ACCEPTANCE

A. Preliminary Procedures: Before requesting final inspection for certification of final acceptance and final payment, complete the following. List exceptions in the request.

1. Submit final payment request with releases and supporting documentation not previously submitted and accepted. Include certificates of insurance for products and completed operations where required.
2. Submit an updated final statement, accounting for final additional changes to the Contract Sum.
3. Submit a certified copy of Architect's final inspection list of items to be completed or corrected, stating each item has been completed or otherwise resolved for acceptance, and list has been endorsed and dated by Architect.
4. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar final record information.
5. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Substantial Completion, or when Owner took possession of and responsibility for corresponding elements of the Work.
6. Submit consent of surety to final payment.
7. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
8. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.
9. Deliver tools, spare parts, extra stock, and similar items. Provide listing of the materials turned over to Owner, indicating quantity and date of delivery.

B. Re-inspection Procedure: Architect will re-inspect the Work upon receipt of notice that the Work, including inspection list items from earlier inspections, has been completed, except items whose completion has been delayed because of circumstances acceptable to Architect.

1. Upon completion of re-inspection, Architect will prepare a certificate of final acceptance or advise Contractor of Work that is incomplete or of obligations that have not been fulfilled but are required for final acceptance.
2. Architect and Consulting Engineers will make only one inspection to determine final completion. If Work is not finally complete, successive inspections required shall be charged to Contractor at Architect's and Consulting Engineer's Current billing rate, including mileage and travel time.
   a. Payment to Architect may be withheld from Contractor's remaining payment due to compensate for this cost.

1.4 RECORD DOCUMENT SUBMITTALS

A. General: Do not use record documents for construction purposes; protect from deterioration and loss in a secure, fire-resistive location; provide access to record documents for the Architect's and Owner's reference during normal working hours.

B. Record Drawings: Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark set to show actual installation where installation varies substantially from the Work as originally shown. Mark whichever drawing is most capable of showing conditions fully and accurately; where Shop Drawings are used, record a cross-reference at the corresponding location on the Contract Drawings. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

1. Mark record sets with red erasable pencil; use other colors to distinguish between variations in separate categories of the Work.
2. Mark new information that is important to the Owner, but was not shown on Contract Drawings or Shop Drawings.
3. Note related Change Order numbers where applicable.
4. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover of each set.

C. Record Specifications: Maintain one complete copy of the Project Manual, including addenda, and one copy of other written construction documents such as Change Orders and modifications issued in printed form during construction. Mark these documents to show substantial variations in actual Work performed in comparison with specification text and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.
   1. Upon completion of the Work, submit Record Specifications to the Architect for transmittal to the Owner's records.

D. Maintenance Manuals: Organize operating and maintenance data into suitable sets of manageable size. Bind properly indexed data in individual heavy-duty 2 inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark appropriate identification on front and spine of each binder. Include the following types of information:
   1. Emergency instructions.
   2. Parts list for major equipment.
   3. Copies of warranties.
   4. Wiring diagrams.
   5. Recommended "turn around" cycles.
   6. Inspection procedures.
   7. Shop Drawings and Product Data.
   8. Fixture lamping schedule.

E. Warranty Manual: In a separate but similar binder to the Maintenance Manual, each Contractor shall include all required guarantees, warranties, and maintenance contracts for items as they exist. Statements of warranty shall be jointly signed by manufacturer, installer, and Contractor and shall identify the Project by name, commission number, and address. In addition, indicate duration and expiration of each warranty and guarantee.

F. Other Items:
   1. Include updated list of Suppliers and Subcontractors.
   2. Written confirmation submitted by Contractor submitted on company letterhead indicating intent to comply with warranty requirements indicated in following paragraph.

1.5 WARRANTY

A. For a period of one year from date of final acceptance by the Owner, each Contractor shall unconditionally warrant all materials, equipment, systems, and workmanship to be free from inherent defects, and warrants against any malfunction caused thereby. Each Contractor shall, at his own expense, cause defects discovered during the one year period to be removed, repaired, and replaced to the complete satisfaction of the Owner.

B. Owner shall notify Contractor in writing stating defects and repairs to be made and Contractor agrees to remedy defects and make repairs as directed by Owner and to start the work not more than 5 days from notification receipt. Owner may cause repairs to be made and charge the expense to Contractor.

C. The warranty shall not serve to reduce any longer guarantee or warranty periods under which any units or components are regularly sold, or which require longer warranties under specification requirements.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.1 CLOSEOUT PROCEDURES

A. Operating and Maintenance Instructions: Arrange for each installer of equipment that requires regular maintenance to meet with Owner's designated personnel to provide instruction in proper operation and maintenance. If installers are not experienced in procedures, provide instruction by manufacturer's representatives. Include a detailed review of the following items:

1. Maintenance manuals.
2. Record documents.
3. Spare parts and materials.
4. Tools.
5. Lubricants.
6. Fuels.
7. Identification systems.
8. Control sequences.
9. Hazards.
10. Cleaning.
11. Warranties and bonds.
12. Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

1. Start-up.
2. Shutdown.
3. Emergency operations.
4. Noise and vibration adjustments.
5. Safety procedures.
6. Economy and efficiency adjustments.
7. Effective energy utilization.

C. Complete start-up testing of systems, and instruction of Owner's operating and maintenance personnel.

1. Before final acceptance, perform equipment demonstrations for Owner's representatives as required under various Sections of the Specifications.
2. Prepare a Certificate of Demonstration for each system or item of equipment demonstrated. The Certificate shall indicate date and time of demonstration, system demonstrated, typewritten name and signature of demonstrator and other demonstration participants.
3. Arrange directly with Owner to determine date and time of demonstrations and name(s) of Owner's representatives who will attend.

3.2 FINAL CLEANING

A. General: General cleaning during construction is defined by the Construction Manager and included in the Construction Manager's written instructions.

B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Remove labels that are not permanent labels. Comply with manufacturer's instructions.

1. Complete the following cleaning operations before requesting inspection for Certification of Substantial Completion.
2. General Contractor:
   a. Clean transparent materials, including glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
   b. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Leave concrete floors broom clean. Vacuum carpeted surfaces. Mop resilient floor surfaces.
   c. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are not paved or planted, to a smooth even-textured surface.
3. Plumbing Contractor:
   a. Clean plumbing fixtures, including any fixtures used during construction for final cleaning.
4. Heating Contractor:
   a. Refer to requirements under temporary heat in Section 01 50 00, Temporary Facilities.
   b. Wipe surfaces of mechanical equipment. Remove excess lubrication and other substances.
5. Electrical Contractor:
   a. Replace bulbs used for temporary lighting during the construction period.
   b. Clean electrical devices and light fixtures, removing bugs, debris, stains, rust, and dirt for final inspection.

C. Remove temporary protection and facilities installed for protection of the Work during construction.

D. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

1. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

3.3 RELEASE OF LIENS

A. The lien laws of the State of Ohio shall govern all work and materials.

B. Before final payment is made the Contractor, shall furnish the Owner with a full Release of Lien signed by all Subcontractors and Materialmen associated in any way with the Work. Submittal shall include the following:

1. AIA Document G 706, "Contractor's Affidavit of Payment of Debts and Claims".
2. AIA Document G 706A, "Contractor's Affidavit of Release of Liens".
3. AIA Document G 707, "Consent of Surety Company to Final Payment".

C. If any subcontractor refuses a release or receipt in full, the Contractor shall furnish a bond satisfactory to the Owner to indemnify the Owner against any lien.

D. If any lien remains unsatisfied after all payments are made, the Contractor shall refund to the Owner all the monies that the latter may have been compelled to pay on discharging such liens including all costs and a reasonable attorney's fee.

END OF SECTION 01 70 00

SECTION 01 73 29 — CUTTING AND PATCHING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies general requirements for cutting, fitting, and patching of the Work required to:

1. Make the several parts fit properly.
2. Uncover work to provide for installing, inspecting, or both, of ill-timed work.
3. Remove and replace work not conforming to requirements of the Contract Documents.
4. Remove and replace defective work.
5. Repair existing work to remain.
6. Remove samples of work for testing.
7. Provide openings in elements of work for penetrations such as piping, conduit, and ductwork.
8. Uncover work for observation, at the direction of the Architect.
9. Repair damage.

B. Cutting and patching includes removing and replacing of paved areas, walks, curbs, sod, and other sitework, as may be required during excavation operations by any of the Prime Contractors.

C. Related Sections:

1. Selective Demolition - Ref: Section 02 41 00.
2. Additional requirements for cutting and patching for plumbing and mechanical Work - Ref: Divisions 22 and 23.
3. Additional requirements for cutting and patching for electrical Work - Ref: Division 26.

1.2 QUALITY ASSURANCE

A. Requirements for Structural Work: Do not cut and patch structural elements in a manner that would reduce their load-carrying capacity or load-deflection ratio.

B. Operational and Safety Limitations: Do not cut and patch operating elements or safety related components in a manner that would result in reducing their capacity to perform as intended, including energy performance, or result in increased maintenance, or decreased operational life or safety.

C. Visual Requirements: Do not cut and patch construction exposed on exterior or in occupied spaces, in a manner that would, in Architect's opinion, reduce building's aesthetic qualities, or result in visual evidence of cutting and patching. Remove and replace Work cut and patched in a visually unsatisfactory manner.

1. Quality of workmanship of patching of existing work shall be determined by comparison to existing work.
2. Quality of existing materials to be patched shall be determined by testing, if necessary.

1.3 PROJECT CONDITIONS

A. The existing building will be occupied during the period in which the Work will be conducted. Avoid interference with use of building or interruption of access to the various areas of the building. Do not impede emergency egress through exits at any time during construction.

1. The nature of the Project requires extensive restrictions upon noise, safety precautions, and sanitation.

B. Do not cut existing mechanical, and electrical services which are to remain in use until provisions have been made to relocate or reconnect them. Refer to Section 01 50 00.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Use materials identical to existing materials. If identical materials are not available or cannot be used where exposed surfaces are involved, use materials matching existing adjacent surfaces to the fullest extent possible with regard to visual effect and approved by the Architect. Use materials whose installed performance will equal or surpass that of existing materials.

1. Materials are not required to be identical in appearance for concealed patching.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before cutting existing surfaces, examine surfaces to be cut and patched and conditions under which cutting and patching is to be performed. Take corrective action before proceeding, if unsafe or unsatisfactory conditions are encountered.

1. Before proceeding, meet at the site with parties involved in cutting and patching, including mechanical and electrical trades. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

3.2 PREPARATION

A. Temporary Support: Provide temporary support of Work to be cut.

B. Protect existing construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of the Project that might be exposed during cutting and patching operations.

C. Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.

D. Take precautions necessary to avoid cutting existing pipe, conduit or ductwork serving the building, but scheduled to be removed or relocated until provisions have been made to bypass them.

3.3 CUTTING AND PATCHING

A. Each Contractor shall perform cutting and patching as required to complete his work, unless specifically noted otherwise.

B. Employ skilled workmen to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time and complete without delay.

1. Cut existing construction to provide for installation of other components or performance of other construction activities and the subsequent fitting and patching required to restore surfaces to their original condition.

C. Cutting, when necessary, shall be done with tools and methods to prevent unnecessary damage to surrounding areas or equipment. No cutting shall be done which will reduce the structural strength of the building. If cutting is necessary, consult Architect and do not proceed with cutting operations until written approval is given.

1. In general, where cutting is required use hand or small power tools designed for sawing or grinding, not hammering and chopping. Cut holes and slots neatly to size required with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. To avoid marring existing finished surfaces, cut or drill from the exposed or finished side into concealed surfaces.
3. Cut through concrete and masonry using a cutting machine such as a carborundum saw or diamond core drill.
4. Bypass utility services such as pipe or conduit, before cutting, where services are shown or required to be removed, relocated or abandoned. Cut-off pipe or conduit in walls or partitions to be removed. Cap, valve or plug and seal the remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after bypassing and cutting.

D. Patching: Patch with durable seams that are as invisible as possible. Comply with specified tolerances.

1. Inspect and test patched areas to demonstrate integrity of the installation.
2. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
3. Where removal of walls or partitions extends one finished area into another, patch and repair floor and wall surfaces in the new space to provide an even surface of uniform color and appearance. Remove existing floor and wall coverings and replace with new materials, if necessary to achieve uniform color and appearance.
   a. Where patching occurs in a smooth painted surface, extend final paint coat over entire unbroken containing the patch, after the patched area has received primer and second coat.
4. Patch, repair or re-hang existing ceilings as necessary to provide an even plane surface of uniform appearance.

E. The final appearance and integrity of the patched and refinished areas must meet the approval of the Architect. Wall, floor, and ceiling refinishing must extend to logical termination lines (entire ceiling of room, for example), if an acceptable appearance cannot be attained by finishing a partial area.

1. When, in the Architect's opinion, satisfactory results cannot or have not been achieved, defective surfaces shall be covered with approved finish materials, including metal and wood trim, adequately fastened and aligned.

3.4 CLEANING

A. Thoroughly clean areas and spaces where cutting and patching is performed or used as access.

END OF SECTION 01 73 29

SECTION 02 41 00 - DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

B. Removal and protection of existing fixtures, materials, and equipment items to be saved or reused.

C. Abandonment and removal of designated utilities and utility structures.

D. Shoring and support of existing structure to facilitate removals and installation of new work.

E. Removal of waste and debris.

1.2 DEFINITIONS

A. Demolition: Dismantle, raze, destroy or wreck any building or structure or any part thereof.

B. Remove: Detach or dismantle items from existing construction and dispose of them off site, unless items are indicated to be salvaged or reinstalled.

C. Remove and Salvage: Detach or dismantle items from existing construction in a manner to prevent damage. Clean, package, label and deliver salvaged items to Owner in ready-for-reuse condition.

D. Remove and Reinstall: Detach or dismantle items from existing construction in a manner to prevent damage. Clean and prepare for reuse and reinstall where indicated.

E. Existing to Remain: Designation for existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

1.3 SUBMITTALS

A. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities. Include coordination for shutoff, capping, and continuation of utility services and details for dust and noise control protection.

1. Indicate extent of demolition, removal sequencing, bracing and shoring, and location and construction of barricades and fences.

2. Demolition firm qualifications.

B. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.4 QUALITY ASSURANCE

A. Items within existing building designated to be removed shall be dismantled by the Contractor for that class of work. Example, Electrical Contractor shall dismantle or remove lights, wiring, conduit, and other electrical items; Plumbing Contractor shall dismantle or remove water closets, lavatories, piping, and other plumbing items; Mechanical Contractor shall remove

ductwork, registers, fans, and other mechanical items; and General Contractor shall dismantle or remove walls, room bases, and similar items.

B. Demolition Firm Qualifications: Company specializing in the type of work required.

C. Conduct selective demolition work in a manner to minimize the need for disruption to other building occupants. Provide a minimum of 72 hours advance notice to the Owner of demolition activities that will affect the building's normal operations.

1. Minimum of 10 years of documented experience.

2. Comply with demolition codes and local ordinances having jurisdiction.

3. Comply with applicable procedures when discovering hazardous or contaminated materials.

1.5 PROJECT CONDITIONS

A. The Owner will occupy portions of the building immediately adjacent to areas of selective demolition. Conduct work in a manner that minimizes the need for disruption of the Owner's normal operations. Provide a minimum of 72 hour advance notice to the Owner when demolition activities will affect the Owner's normal operations.

B. Establish benchmarks on existing construction. Monitor benchmarks daily and promptly notify Architect if changes in elevation or other damages occur.

C. Provide temporary barricades and other forms of protection to protect Owner's personnel and general public from injury due to selective demolition work.

1. Protect existing finish work that is to remain in place from damage during demolition operations.

2. Remove temporary protection at completion of the work.

D. Promptly repair damages to adjacent facilities caused by demolition work. Cost of repair at Contractor's expense.

PART 2 PRODUCTS -- NOT USED

PART 3 EXECUTION

3.1 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Comply with applicable requirements of NFPA 241.

3. Use of explosives is not permitted.

4. Take precautions to prevent catastrophic or uncontrolled collapse of components to be removed.

5. Provide, erect, and maintain shoring and bracing, support to prevent movement or collapse of areas to be demolished and adjacent facilities to remain, temporary barriers and security devices.

6. Stop demolition activities and notify Owner and Architect immediately if safety of structure appears to be endangered. Take precautions to support structure until a determination is made to continue operations.

7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

8. Cover and protect furniture, equipment, and fixtures from soiling and damage when demolition work is performed in areas where those items have not been removed.

9. Do not close or obstruct roadways or sidewalks without permits from authority having jurisdiction.

10. Conduct operations to minimize obstruction of public and private entrances and exits. Do not obstruct required exits at any time. Protect persons using entrances and exits from removal operations.

11. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon, or limit access to their property.

B. Do not begin removal until receipt of notification to proceed from Owner.

C. Do not begin removal until built elements to be salvaged or relocated have been removed.

D. Protect existing structures and other elements to remain in place and not removed.

1. Provide bracing and shoring.

2. Prevent movement or settlement of adjacent structures.

3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations.

F. Hazardous Materials:

1. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

G. Perform demolition in a manner that maximizes salvage and recycling of materials.

1. Dismantle existing construction and separate materials.

2. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.2 EXISTING UTILITIES

A. Coordinate work with utility companies. Notify utilities before starting work, comply with their requirements, and obtain required permits.

B. Protect existing utilities to remain from damage.

C. If unanticipated mechanical, electrical, or structural elements conflicting with intended function or design are encountered, investigate and measure both nature and extent of conflict and submit a detailed report to the Architect. Rearrange selective demolition schedule as necessary to continue overall job progress without undue delay.

D. Do not disrupt public utilities without permit from authority having jurisdiction.

E. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Owner.

F. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Owner.

G. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

H. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

I. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone. Identify and mark, in same manner as other utilities to remain, utilities to be reconnected.

3.3 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Existing construction and utilities indicated on drawings are based on casual field observation and existing record documents only.

1. Verify construction and utility arrangements are as indicated.

2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from areas that remain occupied.

1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 01 50 00 to prevent spread of dust or fumes to occupied portions of the building.

C. Remove existing work as indicated and required to accomplish new work.

1. Remove items indicated on drawings.

D. Services including, but not limited to, HVAC, Plumbing, Fire Protection, Electrical, and Telecommunications: Remove existing systems and equipment as indicated.

1. Maintain existing active systems to remain in operation, and maintain access to equipment and operational components.

2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.

3. Verify that abandoned services serve only abandoned facilities before removal.

4. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings. Remove back to source of supply where possible, otherwise cap stub and tag with identification.

E. Protect existing work to remain.

1. Prevent movement of structure. Provide shoring and bracing as required.

2. Perform cutting to accomplish removal work neatly and as specified for cutting new work.

3. Repair adjacent construction and finishes damaged during removal work.

4. Patch to match new work.

3.4 DEBRIS AND WASTE REMOVAL

A. Promptly remove debris, junk, and trash from site resulting from demolition operations. Do not throw debris from windows or roof areas. Conduct debris to the ground using chutes or other acceptable methods. Transport and legally dispose of debris off site.

1. Burning of debris and waste materials is not permitted on project site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

3.5 SALVAGED ITEMS

A. Where indicated on the drawings, carefully remove indicated items. Clean, store, and turn over to the Owner and obtain receipt.

B. Before start of the work, the Owner will salvage all items or designate such items that are to be retained. Items not indicated to be reused on the drawings or designated by the Owner for salvage, shall become the property of the Contractor and be removed from the structure as work progresses. Storage or sale of removed items on the site will not be permitted.

3.6 CLEANUP AND REPAIR

A. Upon completion of demolition work, remove tools, equipment, and demolished materials from site. Remove protection and leave interior areas broom clean.

1. Repair demolition performed in excess of that required. Return elements of construction and surfaces to remain to condition existing before start of operations. Repair adjacent construction or surfaces soiled or damaged by selective demolition work.

2. Remove temporary barricades and enclosures after work is completed, unless required during new construction operations.

END OF SECTION

SECTION 05 50 00 - METAL FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Shop fabricated steel items, including:

1. Miscellaneous framing and supports for applications where framing and supports are not specified in other sections.

2. Countertop support angles.

1.2 RELATED REQUIREMENTS

A. Section 09 90 00 - Painting and Coating.

1.3 SUBMITTALS

A. Product Data: Submit for products used in miscellaneous metal fabrications, including paint products and grout.

B. Samples: Submit representative samples of materials and finished products when requested by Architect.

C. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

D. Submit qualification data specified in "Quality Assurance". Include list of completed projects with project name, addresses, names of Architects and Owners, and other information specified.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in successfully producing metal fabrications similar to that indicated for this Project, with sufficient production capacity to produce required units without causing delay in the work.

B. Installer Qualifications: Arrange for installation of metal fabrications specified in this section by same firm that fabricated item.

C. Qualify welding processes and operators in accordance with AWS D1.1 "Structural Welding Code-Steel" and D1.3 "Structural Welding Code-Sheet Steel".

1.5 PROJECT CONDITIONS

A. Check actual locations of walls and other construction to which metal fabrications must fit, by accurate field measurements before fabrication; show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay of Work.

1. Where field measurements cannot be made without delaying the Work, guarantee dimensions and proceed with fabrication of products without field measurements. Coordinate construction to ensure that actual opening dimensions correspond to guaranteed dimensions. Allow for trimming and fitting.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

A. General: Provide materials exposed to view that are selected for their surface flatness, smoothness, and freedom from surface blemishes. Do not use materials whose exposed surfaces exhibit pitting, seam marks, roller marks, rolled trade names, roughness, and variations in flatness exceeding those permitted by reference standards.

B. Steel Sections: ASTM A 36/A 36M.

C. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

D. Plates: ASTM A283/A283M.

E. Pipe: ASTM A 53/A 53M Grade B Schedule 40, black finish.

F. Uncoated Steel Sheet:

1. Structural Quality: ASTM A 611, cold-rolled steel sheet, Grade A, unless otherwise indicated or required by design loading.

2. Commercial Quality: ASTM A 366, cold-rolled steel sheet.

G. Brackets, Flanges, and Anchors: Cast or formed metal of the same type material and finish as supported rails, unless otherwise indicated.

H. Bolts, Nuts, Washers, and Concrete Inserts: ASTM A 325 (ASTM A 325M), Type 1.

I. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

J. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

K. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 GROUT AND ANCHORING CEMENT

A. Non-shrink Non-metallic Grout: Premixed, factory-packaged, non-staining, non-corrosive, non-gaseous grout complying with ASTM C 1107, Grades A, B, or C. Provide grout specifically recommended by manufacturer for interior and exterior applications of type specified in this section.

B. Products: Subject to compliance with requirements, provide one of the following:

1. Euclid Chemical Co. "Euco N-S Grout"; Euclid Chemical Co.

2. L&M Construction Chemicals "Crystex".

3. Master Builders "Masterflow 713".

4. Sonneborn Building Products ChemRex "Sonogrout".

2.3 FASTENERS

A. General: Provide zinc-coated fasteners for exterior use or where built into exterior walls. Select fasteners for the type, grade, and class required.

B. Bolts and Nuts: Regular hexagon head type, ASTM A 307, Grade A.

C. Machine Screws: Cadmium plated steel, FS FF-S-92.

2.4 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.

C. Allow for thermal movement resulting from a maximum change (range) in ambient temperature of 100 degrees F. in the design, fabrication, and installation of installed metal assemblies to prevent buckling, opening up of joints, and overstressing of welds and fasteners. Base design calculations on actual surface temperatures of metals due to both solar heat gain and nighttime sky heat loss.

D. Continuously seal joined members by continuous welds to comply with AWS recommendations and the following:

1. Use materials and methods to minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.

4. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and contour of welded surface matches those adjacent.

E. Shear and punch metals cleanly and accurately.

F. Ease exposed edges to uniform radius approximately 1/32 inch, unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

G. Remove sharp or rough edges on exposed traffic surfaces.

H. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

I. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

J. Cut, reinforce, drill, and tap miscellaneous metal work as indicated to receive finish hardware, screws, and similar items.

K. Fabricate joints that will be exposed to weather in a manner to exclude water, or provide weep holes where water may accumulate.

2.5 FABRICATED ITEMS

A. Miscellaneous Framing and Supports:

1. General: Provide steel framing and supports for applications indicated or which are not part of structural steel framework, as required to complete work.

2. Fabricate units to sizes, shapes, and profiles indicated and required to receive adjacent other construction retained by framing and supports. Fabricate from structural steel shapes, plates, and steel bars of welded construction using mitered joints for field connection. Cut, drill, tap units to receive hardware, hangers, and similar items.

a. Except as otherwise indicated, space anchors 24 inches on center and provide minimum anchor units in the form of steel straps 1-1/4 inches wide x 1/4 inch x 8 inches long.

2.6 FINISHES - STEEL

A. Prime paint steel items.

1. Exceptions: Do not prime surfaces where field welding is required.

B. Prime Painting: One coat.

C. Finish metal fabrications after assembly.

2.7 FABRICATION TOLERANCES

A. Squareness: 1/8 inch maximum difference in diagonal measurements.

B. Maximum Offset Between Faces: 1/16 inch.

C. Maximum Misalignment of Adjacent Members: 1/16 inch.

D. Maximum Bow: 1/8 inch in 48 inches.

E. Maximum Deviation From Plane: 1/16 inch in 48 inches.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.3 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing miscellaneous metal fabrications to in-place construction; include threaded fasteners for concrete and masonry inserts, toggle bolts, through-bolts, lag bolts, wood screws, and other connectors as required.

C. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

D. Perform field welding in accordance with AWS D1.1/D1.1M.

E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints, but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade the surfaces of exterior units which have been hot-dip galvanized after fabrication, and are intended for bolted or screwed field connections.

F. Obtain approval prior to site cutting or making adjustments not scheduled.

G. After erection, prime welds, abrasions, and surfaces not shop primed .

1. Comply with SSPC-PA 1 requirements for touch-up of field painted surfaces.

2. Apply brush or spray to provide a minimum dry film thickness of 2.0 mils.

3.4 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fire retardant treated wood materials.

B. Concealed wood blocking, framing, and supports where required, including support of wall mounted millwork, equipment and fixtures.

C. Miscellaneous wood nailers, furring, and grounds.

1.2 RELATED REQUIREMENTS

A. Section 06 20 00 - Finish Carpentry.

B. Section 06 41 00 - Architectural Wood Casework.

C. Division 26 - Electrical.

1.3 SUBMITTALS

A. Product Data: Submit technical data on construction adhesives and fire-retardant materials.

1. Include chemical treatment manufacturer's instructions for handling, storing, installation, and finishing of treated wood.

a. For fire retardant treated wood products, include certification by treating plant that treated material complies with specified standard and other requirements and data related to bending strength, stiffness, and fastener holding capabilities of treated materials.

b. Material test reports from qualified independent testing laboratory indicating and interpreting test results related to compliance of pressure treated wood products with indicated requirements.

c. Chemical treatment manufacturer warranty for each type of treatment.

B. Manufacturer's Certificate: Certify that wood products supplied for rough carpentry meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Wood blocking shall be fire retardant treated.

B. Single Source Responsibility: Obtain each type of treated wood from one source for both formulation and treatment.

C. Lumber: Comply with PS 20 and approved grading rules and inspection agencies.

D. Exposed-to-View Rough Carpentry: Submit manufacturer's certificate that products meet or exceed specified requirements, in lieu of grade stamping.

E. Wood Treatment Plant: A company licensed by the wood treatment manufacturer who is experienced in performing the work of this section and has specialized in the treatment of wood products similar to that required for this project.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Cover rough carpentry products to protect against moisture, direct sunlight, surface contamination, corrosion, and construction traffic. Support stacked products to prevent deformation and place spacers between each bundle of lumber and plywood to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Lumber: Comply with PS 20 and requirements of inspection agencies certified by American Lumber Standards Committee (ALSC) Board of Review.

1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.

2. Grading Agencles: Inspection agencies and abbreviations used to reference them with lumber grades and species include the following:

a. SPIB - Southern Pine Inspection Bureau.

b. WCLIB - West Coast Lumber Inspection Bureau.

c. WWPA - Western Wood Products Association.

3. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency showing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing and mill.

4. Quality Mark: Treated wood members shall bear an end tag or permanent ink stamp indicating the following:

a. Wood treatment company name.

b. Treatment plant city and state.

c. Symbol of chemicals used.

d. Approved use.

e. Code report number.

B. Sizes: Nominal sizes as indicated on drawings, S4S.

C. Moisture Content: S-dry or MC19 at time of dressing and shipment for sizes 2 inches or less in nominal thickness.

2.2 MISCELLANEOUS LUMBER

A. General: Provide kiln dried lumber for support or attachment of other construction, including cant strips, nailers, blocking, furring, grounds, stripping, and similar members.

B. Fabricate miscellaneous lumber from dimension lumber of sizes indicated and into shapes shown.

C. Sizes: Nominal sizes as indicated on drawings, S4S.

D. Moisture Content: Kiln-dry or MC15 for lumber items not specified to receive wood preservative treatment.

E. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:

1. Lumber: S4S, No. 2 or Standard Grade.

2. Boards: Standard or No. 3.

2.3 CONSTRUCTION PANELS

A. Construction Panel Standards: Comply with PS 1 U.S. Product Standard for Construction and Industrial Plywood for plywood construction panels. For products not manufactured nder PS 1 provisions, comply with APA PRP-108.

1. Each construction panel shall be factory marked with APA trademark showing compliance with grade requirements.

2.4 ACCESSORIES

A. Fasteners and Anchors:

1. Nails, Wire Brads, and Staples: FS FF-N-105.

2. Power Driven Fasteners: National Evaluation Report NEF-272.

3. Wood Screws: ANSI B18.6.1.

4. Lag Bolts: ANSI B18.2.1.

5. Bolts: Steel bolts complying with ASTM A307, GradeA with ASTM A563 hex nuts and, where indicated, flat washers.

6. The use of powder actuated fasteners and anchors is prohibited. Powder driven fasteners and anchors are defined as fasteners and anchors driven by compressed air or have explosive caps used when striking the fastener or anchor into place.

2.5 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.

1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

B. Fire Retardant Treatment: Where fire retardant treated wood is indicated, pressure impregnate lumber and plywood with chemicals to comply with AWPA C20 and C27 respectively for treatment type indicated. Identify fire retardant treated wood with appropriate classification marking of Underwriters Laboratories, U.S. Testing, Timber Products Inspection, or other testing and inspecting agency acceptable to authorities having jurisdiction.

1. Interior lumber and plywood concealed from view in partitions, above ceilings, and at other designated locations shall be fire retardant treated and bear label certifying the fire-hazard classification is less than 25 for flame spread, fuel contributed, and smoke generation when tested in accordance with UL Test 723, ASTM E84 or NFPA Test 355.

2. Manufacturers:

a. Lonza Wood Protection, Inc.

b. Hoover Treated Wood Products, Inc.

c. Osmose, Inc.

3. Interior Type A: Lonza Wood Protection "Dricon" complying with AWPA U1, Use Category UCFA, Commodity Specification H, low temperature (low hygroscopic) type, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.

a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.

b. Treat rough carpentry items as indicated .

c. Do not use treated wood in applications exposed to weather or where the wood may become wet.

4. Fire retardant treated wood shall have the following properties:

a. No reduction in bending strength, stiffness, and fastener holding capacities below values published by the chemical formulation manufacturer that are based on tests by a qualified independent testing laboratory of treated wood products identical to those indicated for this project under elevated temperature and humidity conditions simulating installed conditions.

b. No other form of degradation will occur due to acid hydrolysis or other causes related to manufacture and treatment.

c. No corrosion of metal fasteners shall result from their contact with treated wood.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordinate installation of rough carpentry members specified in other sections.

3.2 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

D. Discard materials with defects that impair quality of rough carpentry construction and are too small to use in fabricating rough carpentry with minimum joints or optimum joint arrangement.

E. Set rough carpentry to required levels and lines with members plumb, true to line, and cut and fitted.

F. 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.

G. Securely attach rough carpentry work to substrates by anchoring and fastening as indicated.

H. Use common wire nails unless otherwise indicated. Use finishing nails for finish work. Select fasteners of size that will not penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting of wood, predrill as required.

3.3 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support door hardware, wall protection, finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code; other material acceptable to authorities having jurisdiction may be used in lieu of solid wood blocking.

C. In metal stud walls, provide continuous blocking around door and window openings for anchorage of frames, securely attached to stud framing.

D. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

E. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.4 INSTALLATION OF ACCESSORIES AND MISCELLANEOUS WOOD

A. Install wood grounds, nailers, blocking and sleepers where shown and as required to screeding or attachment of other work. Form to shapes shown and cut as required for true line and level of work to be attached.

1. Attach to substrates as required to support applied loading. Countersink bolts and nuts flush with surfaces. Building into masonry as masonry work progresses. Anchor to formwork before concrete placement.

3.5 TOLERANCES

A. Framing Members: 1/4 inch from true position, maximum.

B. Variation from Plane, Other than Floors: 1/4 inch in 10 feet maximum, and 1/4 inch in 30 feet maximum.

3.6 CLEANING

A. Waste Disposal:

1. Comply with applicable regulations.

2. Do not burn scrap on project site.

3. Do not burn scraps that have been pressure treated.

4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Standing and running wood trim

B. Wood door frames, glazed frames.

C. Plastic laminate shelving, adjustable shelving standards, and coat rods

D. Display cases.

E. Hardware and attachment accessories.

1.2 RELATED REQUIREMENTS

A. Section 01 61 19 - Ohio Volatile Organic Compound (VOC) Content Restrictions.

B. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

C. Section 06 41 00 - Architectural Wood Work: Shop fabricated custom cabinet work and cabinet hardware.

D. Section 08 14 16 - Flush Wood Doors.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

C. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.4 SUBMITTALS

A. Product Data:

1. Provide manufacturer's product data, storage, and handling instructions for factory-fabricated units.

2. Provide data on fire retardant treatment materials and application instructions.

3. Provide instructions for attachment hardware and finish hardware and other manufactured items incorporated into finish carpentry.

B. Shop Drawings: Indicate materials, component profiles and elevations, fastening methods, jointing details, accessories, and relationship to adjacent construction, to a minimum scale of 1-1/2 inch to 1 ft.

1. Indicate wood species and manufacturer's name for manufactured items.

2. Indicate locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other sections.

C. Color Charts: Submit plastic laminate manufacturer's color charts for color selection. Include full range of available colors, textures, and patterns.

D. Samples:

1. Submit one sample of lumber, 50 square inches, for each species, cut, and finish required. Finish sample on one side and one edge with specified finish.

2. Submit veneer leaves selected from flitches to be used for transparent finished millwork.

3. Submit two samples of wood trim 12 inches long.

E. Submit product certificates signed by fabricator certifying products comply with specified requirements.

F. Submit fabricator's and installer's qualifications, including a list of completed projects, complete project name, names and addresses of each project's Architect and Owner, and other required information.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with 2003 8th Edition AWI Architectural Woodwork Quality Standards Illustrated, Custom grade.

B. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.

C. Installer Qualifications: Company specializing in installing the work of this section with minimum three years documented experience in installing finish carpentry items similar in type and quality to the work required for the project.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver factory-fabricated units to project site in original packages, containers or bundles bearing brand name and identification.

B. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

C. Protect from moisture damage.

D. Handle materials and products to prevent damage to edges, ends, or surfaces.

1.7 PROJECT CONDITIONS

A. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

B. Comply with AWI Quality Standards Section 1700 requirements and finish carpentry fabricator and installer recommendations for optimum temperature and humidity conditions during storage and installation.

C. Before delivery and installation of finish carpentry work to the project site, the building environment shall be stabilized to provide conditions that will maintain a relative humidity of not less than 25 percent and not more than 50 percent. Do not install finish carpentry until those conditions are reached and stabilized so millwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

D. Field verify dimensions of other construction before fabricating finish carpentry components. Show recorded measurements on shop drawings.

1. When field verifying measurements will delay the work, guarantee dimensions and proceed with fabrication of finish carpentry items. Coordinate construction of adjacent surfaces and components to make sure actual dimensions match dimensions guaranteed without field verification.

E. Coordinate the work with installation of associated and adjacent components and construction progress to avoid delays in the work.

PART 2 PRODUCTS

2.1 FINISH CARPENTRY ITEMS

A. Finish carpentry materials shall be the best of their respective kinds. Materials used in finished work shall be clear, free of cracks, checks, knots, and other imperfections that may interfere with proper completion of the work. Warped or otherwise imperfect work shall be removed and replaced by responsible Contractor.

B. Surface Burning Characteristics: Provide materials having fire and smoke properties as required by applicable code.

2.2 LUMBER MATERIALS

A. General: Comply with AWI "Quality Standards" Section 100, Lumber.

B. Hardwood Lumber: Maximum moisture content of 6 percent; Grade complying with scheduled AWI Section requirements.

1. Grading: In accordance with NHLA G-101 Grading Rules; www.nhla.org.

C. Lumber used for Rough Framing, Sheathing, Grounds, Blocking and Similar Items: Kiln dried construction grade Hemlock or Douglas Fir.

1. Comply with American Wood Preservers Association Standard C20 for lumber and C27 for plywood for pressure impregnation to provide a flame spread, fuel contributed and

smoke developed, classification of 25 or less when tested by UL in accordance with surface burning characteristics test procedures ASTM E84, NFPA 255 and UL 723.

2.3 SHEET MATERIALS

A. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1 Front Face Grade AA Back Face Grade 1, glue type as recommended for application.

B. General: Comply with AWI "Quality Standards" Section 200, Panel Products.

C. Softwood Plywood: PS 1 Grade A-B; Lumber core.

1. Provide exterior grade plywood where indicated.

2. Panels used for concealed parts may be Grade C-D.

D. Panel Core Board Materials: Except as otherwise required, Contractor shall select either particle board or recycled content board and then consistently use it throughout the project.

1. Particle Board: ANSI A208.1, M-2 Industrial Grade.

2. Fire Retardant Particle Board: Timber Products "Encore FR", Class 1 flame retardant particle board manufactured from recycled wood fiber.

3. Recycled Content Board: Arauco "Vesta", complying with ANSI A208.1, M-2 requirements

4. Recycled Content Fire Rated Board: Arauco "Vesta FR", complying with ANSI A208.1, M-2 requirements and ASTM E84, Class A requirements.

E. Medium Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.

2.4 PLASTIC LAMINATE MATERIALS

A. Manufacturer: As indicated in the Finish Schedule. Comparable products are acceptable from Formica, Abet Laminati, Nevamar, Wilsonart, and Pionite.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:

1. Horizontal and High Use Exposure: Minimum 0.050 inch thick.

2. Vertical and Medium Use Exposure: Minimum 0.028 inch thick

3. Casework Interior Lining: 0.020 inch thick.

4. Balance Sheet: 0.020 inch thick.

C. Laminate Adhesive: Low VOC type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.5 FASTENINGS

A. Fasteners: Of size and type to suit each type of substrate and installation application; non-ferrous or hot-dip galvanized finish.

1. Screws: FS FF-S-111. Provide metal framing supports as recommended by metal framing manufacturer.

2. Nails: FS FF-N-105.

3. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

2.6 ACCESSORIES

A. Adhesive: Low VOC type.

B. Wood Filler: Low VOC type base, tinted to match surface finish color.

C. Adjustable Shelf Standards and Brackets: Knape & Vogt Mfg. Co. KV #87 standards with #182 double hook brackets, bright nickel finish.

1. Provide with necessary clips to secure shelves to brackets.

D. Coat Rods: Knape & Vogt Mfg. Co. KV #770-1 heavy duty steel tubing, 1-1/16 inch outside diameter with KV #734CHR wall brackets and #760 adjustable center hangers at 48 inches on center for lengths over 60 inches.

E. Hardware: See Section 06 41 00 - Architectural Wood Casework.

2.7 WOOD TREATMENT

A. Fire Retardant Treatment (FR-S Type): Lonza Wood Protection "Dricon", chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

B. Provide identification on fire retardant treated material.

C. Deliver fire retardant treated materials cut to required sizes. Minimize field cutting.

D. Kiln dry wood after pressure treatment to maximum 19 percent moisture content.

2.8 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

1. Ease edges to radius indicated for the following:

a. Corners and Edges of Solid Wood Members less than 1 inch thickness: 1/16 inch.

b. Edges of Rails and Similar Members larger than 1 inch thickness: 1/8 inch.

2. Conceal end grain as much as possible. Finish exposed plywood edges the same as finished sides.

3. Machine sand exposed surfaces to an even, smooth surface ready for finishing. Treat nail holes, cuts, cracks, and other defects for an unnoticeable appearance.

B. Wood Moisture Content: Comply with AWI standards for moisture content of lumber and relative humidity conditions during time of fabrication and before, during, and after installation.

C. Fit exposed sheet material edges with 3/8 inch matching hardwood edging. Use one piece for full length only.

D. Cap exposed plastic laminate finish edges with material of same finish and pattern, unless otherwise indicated.

E. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

F. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet from sink cut-outs.

1. Apply laminate backing sheet to reverse face of plastic laminate finished surfaces.

2.9 FACTORY FINISHING

A. Apply wood filler in exposed nail and screw indentations.

B. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

C. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:

1. Transparent: Stain and sheen as selected by the Architect.

D. Seal surfaces in contact with cementitious materials or concealed after installation.

PART 3 EXECUTION

3.1 EXAMINATION

A. Field verify measurements and examine adjoining surfaces. Contractor is responsible for proper fit of all items provided under this Section.

B. Verify adequacy of backing and support framing.

C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

D. See Section 06 10 00 - Rough Carpentry for installation of recessed wood blocking.

3.2 PREPARATION

A. Condition finish carpentry work to average prevailing humidity conditions in installation areas before start of installation.

B. Deliver inserts and similar anchoring devices to be built into substrates before substrates are built.

C. Examine shop fabricated work for completion. Complete finish carpentry work as required, including back priming and removal of packing before start of installation.

D. Seal wood surfaces set against masonry and concealed after installation with a heavy coat of low VOC type sealer.

3.3 INSTALLATION

A. General: Comply with AWI "Quality Standards" Section 1700 installation standards and recommendations unless more stringent requirements are otherwise indicated. Comply with Premium Grade standards when Premium Grade is specified and Custom Grade standards when Custom Grade is specified.

1. Contractor is responsible for restoring and refinishing cabinet work damaged during installation to create a final installation meeting Architect's approval.

B. Set and secure materials and components in place, plumb and level with no distortions.

1. Provide concealed shims as required.

2. Install to a tolerance of 1/8 inch in 8 feet for plumb and level, with no variation in flushness of adjoining surfaces.

3. Install with minimum number of joints possible, using full length pieces. Stagger joints in adjacent and related members. Provide tight fitting joints with full surface contact throughout length of joint.

C. Provide cutouts required for installation of all items, including electrical outlets and lights. Coordinate location with plumbing, heating, and electrical trades.

D. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

E. Install stand and running trim with minimum number of joints possible, using full length pieces from maximum length of lumber available to greatest extent possible. Do not use pieces less than 60 inches long, except where shorter single length pieces are necessary.

1. Fill gaps between standing and running trim and wall with wood filler, sand smooth, and finish same as wood.

F. Install display cases without distortion. Complete installation of hardware and accessory items as indicated.

G. Install hardware in accordance with manufacturer's instructions and adjust to center doors and drawers in openings and provide unencumbered operation.

3.4 SITE TOLERANCES

A. Maximum Variation from True Position: 1/16 inch.

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch.

3.5 CLEANING

A. Clean, lubricate, and adjust hardware.

B. Clean finish carpentry components on exposed and semi-epoxed surfaces. Touch up factory applied finishes to restore damaged or soiled areas.

C. Repair damaged and defective finish carpentry components where possible to eliminate functional and visual defects. Provide new finish carpentry components when repair is not possible or will not be satisfactory.

3.6 SCHEDULE

A. Standing and Running Wood Trim: AWI Section 300, Custom Grade, transparent stained finish. Use pieces made of solid lumber stock. Finger joints are not acceptable.

1. Species: Plain Sliced, veneer to be selected, manufactured from selected First Grade lumber (NHLA).

B. Wood Door Frames and Jambs: AWI Section 900, Custom Grade, transparent stained finish.

1. Species: Plain Sliced, veneer to be selected, manufactured from selected First Grade lumber (NHLA). Use pieces made of solid lumber stock. Finger joints are not acceptable.

2. Frame and Jamb Profile: Rabbetted.

C. Shelving: AWI Section 600, high pressure decorative laminate, Custom grade, veneer core.

1. Color: Selected by Architect from manufacturer's full color range

2. Edge Treatment: As indicated on the drawings

3. Thickness: 3/4 inch shelving up to 30 inches wide, 1 inch shelving 30 inches wide and over.

D. Wood Display Cases: AWI Section 400, Premium Grade, transparent stained finish.

END OF SECTION

SECTION 06 41 00 - ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Custom fabricated cabinet units.

B. Hardware.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 06 20 00 - Finish Carpentry.

1.3 DEFINITIONS

A. Exposed Surfaces: Casework surfaces visible after installation with doors and drawers closed. Other locations considered to be exposed include wall hung cabinet bottoms more than 40 inches above the floor and visible members in open cases or behind clear glass doors.

B. Semi-Exposed Surfaces: Casework members behind opaque doors, including shelves, divisions, interior faces of ends, case backs, drawer sides, backs and bottoms and back face of doors. Tops of cases 6'-6" or more above the floor shall be considered semi-exposed.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Preinstallation Meeting: Convene a preinstallation meeting not less than one week before starting work of this section; require attendance by all affected installers.

1.5 SUBMITTALS

A. Product Data:

1. Provide instructions for attachment hardware, finish hardware, and other manufactured items incorporated into finish carpentry.

B. Shop Drawings: Indicate materials, component profiles and elevations, assembly methods, joint details, fastening methods, accessory listings, hardware location and schedule of finishes.

1. Indicate wood species and manufacturer's name for manufactured items.

2. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcing specified in other Sections.

3. Show locations and sizes of cutouts and holes for items installed in custom cabinet work.

C. Color Samples: Submit plastic laminate manufacturer's color samples for color verification. Include full range of available colors, textures, and patterns.

D. Samples:

1. Submit one sample of laminate clad components, 8-1/2 inches x 11 inches, showing each type, color, pattern, and surface finish required. Include separate samples of unfaced panel product used for the core.

2. Submit one cabinet corner piece showing cabinet front frame joints between stiles and rail and exposed end pieces, 18 inches high x 18 inches wide x 6 inches deep.

3. Submit one sample of each hardware type and finish.

4. Submit 6 inch lengths of each type of cabinet door and drawer front edging and countertop edging.

E. Samples: Submit actual sample items of proposed pulls and hinges, demonstrating hardware design, quality, and finish.

F. Submit fabricator's and installer's qualifications, including a list of completed projects, complete project name, names and addresses of each project's Architect and Owner, and other required information.

1.6 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.

1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

B. Perform work in accordance with 2003 8th Edition AWI/AWMAC Architectural Woodwork Quality Standards Illustrated, Custom quality, unless other quality is indicated for specific items.

C. Installer Qualifications: Company specializing in installing the work of this section with minimum three years documented experience in installing custom cabinet items similar in type and quality to the work required for the project.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage, soiling, and other forms of deterioration.

B. Do not deliver custom cabinets until building is enclosed, painting and similar operations have been completed, and HVAC system is operating and will maintain temperature and relative humidity in installation areas at occupancy levels during the remainder of construction. If custom cabinets must be stored in other than installation areas, store only in areas whose environmental conditions meet requirements specified in "Project Conditions".

1.8 PROJECT CONDITIONS

A. Comply with AWI Quality Standards Section 1700 requirements and custom cabinet fabricator and installer recommendations for optimum temperature and humidity conditions during storage and installation.

B. Before delivery and installation of custom cabinet work to the project site, the building environment shall be stabilized to provide conditions that will maintain a relative humidity of not less than 25 percent and not more than 50 percent. Do not install millwork until those conditions are reached and stabilized so millwork is within plus or minus 1.0 percent of optimum moisture content from date of installation through remainder of construction period.

C. Field verify dimensions of other construction before fabricating custom cabinet components. Show recorded measurements on shop drawings.

1. When field verifying measurements will delay the work, guarantee dimensions and proceed with fabrication of custom cabinet work. Coordinate construction of adjacent surfaces and components to make sure actual dimensions match dimensions guaranteed without field verification.

D. Coordinate the work with plumbing rough-in, electrical rough-in, installation of associated and adjacent components, and construction progress to avoid delays in the work.

E. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure custom cabinets can be supported and installed as indicated.

PART 2 PRODUCTS

2.1 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Custom cabinet materials shall be the best of their respective kinds. Materials used in finished work shall be clear, free of cracks, checks, knots, and other imperfections that may interfere with proper completion of the work. Warped or otherwise imperfect work shall be removed and replaced by responsible Contractor.

C. Plastic Laminate Faced Cabinets: Custom grade.

2.2 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Hardwood Edgebanding: Use solid hardwood edgebanding matching species, color, grain, and grade for exposed portions of cabinetry.

2.3 LUMBER MATERIALS

A. General: Comply with AWI "Quality Standards" Section 100, Lumber.

1. Lumber for Transparent Finish: Use pieces made of solid lumber stock.

B. Lumber used for Rough Framing, Sheathing, Grounds, Blocking and Similar Items: Kiln dried construction grade Hemlock or Douglas Fir.

1. Comply with American Wood Preservers Association Standard C20 for lumber and C27 for plywood for pressure impregnation to provide a flame spread, fuel contributed and smoke developed, classification of 25 or less when tested by UL in accordance with surface burning characteristics test procedures ASTM E84, NFPA 255 and UL 723.

2.4 PANEL MATERIALS

A. General: Comply with AWI "Quality Standards" Section 200, Panel Products.

B. Softwood Plywood: PS 1 Grade A-B; Lumber core.

1. Provide exterior grade plywood where indicated.

2. Panels used for concealed parts may be Grade C-D.

C. Panel Core Board Materials: Except as otherwise required, Contractor shall select either particle board or recycled content board and then consistently use it throughout the project.

1. Particle Board: ANSI A208.1, M-2 Industrial Grade.

2. Fire Retardant Particle Board: Timber Products "Encore FR", Class 1 flame retardant particle board manufactured from recycled wood fiber.

3. Recycled Content Board: Arauco"Vesta", complying with ANSI A208.1, M-2 requirements.

4. Recycled Content Fire Rated Board: Arauco"Vesta FR", complying with ANSI A208.1, M-2 requirements and ASTM E84, Class A requirements.

D. Medium Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.

2.5 PLASTIC LAMINATE MATERIALS

A. Manufacturer: As indicated in the Finish Schedule.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications and as follows:

1. Horizontal Surfaces: HGS, 0.048 inch nominal thickness, colors as indicated, finish as indicated.

2. Vertical Surfaces: VGS, 0.028 inch nominal thickness, colors as indicated, finish as indicated.

3. Cabinet Liner: CLS, 0.020 inch nominal thickness, colors as indicated, finish as indicated.

4. Laminate Backer: BKL, 0.020 inch nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

C. Laminate Adhesive: Low VOC type recommended by laminate manufacturer to suit application; not containing formaldehyde or other volatile organic compounds.

2.6 COUNTERTOPS

A. Plastic Laminate Countertops: Sizes and configurations on the drawings.

2.7 FASTENINGS

A. Fasteners: Size and type to suit application, non-ferrous or hot-dip galvanized finish.

1. Screws: FS FF-S-111. Provide metal framing supports as recommended by metal framing manufacturer.

2. Nails: FS FF-N-105.

3. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations

4. Concealed Joint Fasteners: Threaded steel.

B. Joint Fasteners: Knape & Vogt Model KV 516ZC "Tite Joint" dog bone type joint fasteners at all countertop field joints.

C. Anchors: Type, size and finish required by each substrate for secure anchorage.

1. Provide non-ferrous metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and where required for corrosion resistance.

2. Provide toothed steel or lead expansion bolt devices for drilled in place anchors.

3. Furnish inserts and anchors to be set into concrete or masonry work for subsequent casework anchorage.

2.8 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Plastic Edge Banding: Extruded PVC, convex shaped; smooth finish; self locking serrated tongue; of width to match component thickness.

1. Color: As selected by Architect from manufacturer's full color range.

2. Thickness:

a. Doors and Drawers: Unless otherwise indicated, 3 mm, machine profiled to 1/8 inch radius.

b. Casework Face: 1 mm.

C. Wood Cleats: Hardwood, used with wall supported shelves and countertops.

2.9 HARDWARE

A. Hardware Finish: US32D, satin finish stainless steel unless otherwise indicated.

B. Shelf Pins: Knape & Vogt Mfg. Co. Model 346 ANO anochrome shelf support. Screw shelf to pin.

C. Drawer and Door Pulls: Wire pulls 4 inch projecting type..

D. Cabinet Locks: Keyed cylinder, two keys per lock, master keyed, brass body with dull chrome faces and matching trim for doors and drawers.. Lock locations determined by Architect.

E. Catches: Magnetic. Provide 30 lb. double catches for double doors and full height case doors and 12 lb. single catches for single doors of base and wall hung cabinets. Provide extruded aluminum deadbolt on left-hand door for locked double doors.

F. Work Station Brackets: A & M Hardware or FastCap "Speed Brace" work station brackets, 1/8 inch steel with textured powder coating. Color selected from manufacturer's standard color range.

G. Drawer Slides: Steel, 2-section type with nylon, ball bearing rollers for standard drawers and 3-section full extension drawer slides with ball bearings and nylon rollers for file drawers. Slide lengths and ratings shall suit particular applications.

H. File Hang Rail: Aluminum, 1/2 inch x 1/2 inch x 1/8 inch, anchored to drawer side panels with three screws per side. Sized per full cabinet depth. Brushed finish.

I. Concealed Hinges: Concealed (fully mortised) self-closing type, 170 degree swing, steel with satin finish.

1. Manufacturers:

a. Grass America Inc.

b. Mepla.

c. Hettich America, LP.

d. Julius Blum, Inc.

e. Hafele America.

2.10 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

1. Ease edges to radius indicated for the following:

a. Corners and Edges of Solid Wood Members less than 1 inch thickness: 1/16 inch.

b. Edges of Rails and Similar Members larger than 1 inch thickness: 1/8 inch.

2. Conceal end grain as much as possible. Finish exposed plywood edges the same as finished sides.

3. Machine sand exposed surfaces to an even, smooth surface ready for finishing. Treat nail holes, cuts, cracks, and other defects for an unnoticeable appearance.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Apply edges first and faces or tops second. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises.

E. Provide cutouts for outlet boxes. Verify locations of cutouts from on-site dimensions. Seal cut edges.

PART 3 EXECUTION

3.1 EXAMINATION

A. Field verify measurements and examine adjoining surfaces. Contractor is responsible for proper fit of all items provided under this Section.

B. Verify adequacy of backing and support framing.

C. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

D. See Section 06 10 00 - Rough Carpentry for installation of recessed wood blocking.

3.2 PREPARATION

A. Condition custom cabinet work to average prevailing humidity conditions in installation areas before start of installation.

B. Deliver inserts and similar anchoring devices to be built into substrates before substrates are built.

C. Examine shop fabricated work for completion. Complete custom cabinet work as required, including back priming and removal of packing before start of installation.

3.3 INSTALLATION

A. General: Comply with AWI "Quality Standards" Section 1700 installation standards and recommendations unless more stringent requirements are otherwise indicated. Comply with Premium Grade standards when Premium Grade is specified and Custom Grade standards when Custom Grade is specified.

1. Contractor is responsible for restoring and refinishing cabinet work damaged during installation to create a final installation meeting Architect's approval.

B. Set and secure custom cabinets, rigidly attached to anchors or blocking, plumb, and level and without distortion so doors and drawers fit openings properly and are accurately aligned.

1. Provide concealed shims as required.

2. Use concealed fasteners and appropriate angles and anchorages.

3. Install to a tolerance of 1/8 inch in 8 feet for plumb and level, with no variation in flushness of adjoining surfaces.

4. Maintain veneer sequence.

C. Use concealed joint fasteners to align and secure adjoining cabinet units and countertops.

D. Provide cutouts required for installation of all items, including electrical outlets, lights, and sinks. Coordinate location with plumbing, heating, and electrical trades.

E. Carefully scribe custom cabinet components abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim to conceal larger gaps.

F. Secure cabinets and countertops to grounds, blocking, and stripping using concealed fasteners, appropriate angles and anchorages.

G. Install hardware and adjust to center doors and drawers in openings and provide unencumbered operation.

H. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

3.4 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.5 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

B. Repair damaged and defective custom cabinet components where possible to eliminate functional and visual defects. Provide new custom cabinet components when repair is not possible or will not be satisfactory.

3.6 SCHEDULE

A. Plastic Laminate Countertops: AWI Section 400, high pressure decorative laminate, Custom grade.

1. Color: As Indicated in the Room Finish Schedule.

2. Edge Treatment: As indicated on the drawings.

3. Provide 0.020 inch phenolic backing sheet to underside of countertops and to concealed backsplash faces that are not an integral part of the casework unit and are adhered to the wall.

B. Plastic Laminate Casework: AWI Section 400, Custom grade.

1. Casework Construction: Flush overlay.

   a. Exposed Surfaces: General Purpose 0.050 inch high pressure plastic laminate, including four edges and back face of doors and applied drawer faces.

   b. Semi-Exposed Surfaces: Melamine, except as otherwise indicated.

2. Color: As indicated in the Room Finish Schedule

3. Backs: Melamine, minimum 1/4 inch thick.

4. Shelves: Cabinet liner, except provide high pressure plastic laminate matching casework at open cases. Finish four edges, top and bottom face of shelves in open cases.

   a. Under 30 Inches Wide: 3/4 inch thick.

   b. 30 Inches Wide and Over: 1 inch thick.

5. Doors and Drawer Faces: High pressure plastic laminate and cabinet liner.

   a. 30 Inches Wide x 60 Inches High or Smaller: 3/4 inch thick.

   b. 30 Inches Wide x 60 Inches Higher and Over, Maximum 36 Inches Wide x 72 Inches High: 1 inch thick.

6. Drawer Bottoms, Sides, Backs and Semi-Exposed Fronts: Melamine, minimum 1/2 inch thick with color matched PVC edging.

7. Wall Cabinets: Finish exposed bottoms to match face material and color when bottom is 40 inches above finished floor.

   a. Where two wall cabinets meet at room corner, extend one wall cabinet into corner. Top and bottom access into corner other than from the cabinet door is prohibited.

8. Dust Panels: Provide 1/4 inch plywood or tempered hardboard above compartments and drawers, except where located directly under countertops.

END OF SECTION

SECTION 06 61 16 - SOLID SURFACE FABRICATIONS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Window stools.

1.2 RELATED SECTIONS

A. Section 06 10 00 - Rough Carpentry.

1.3 SUBMITTALS

A. Product Data: Submit product description, fabrication information, and compliance with specified performance requirements.

B. Shop Drawings: Indicate dimensions, component sizes, fabrication details, attachment provisions, and coordination requirements with adjacent work.

C. Samples: Submit minimum 6 inch x 6 inch samples. Indicate full range of color and pattern variation.

D. Qualification Data: Submit qualification data, including list of completed projects with project names, addresses, and names of Architects and Owners.

E. Manufacturer's Installation Instructions: Submit for special procedures and perimeter conditions requiring special attention

F. Maintenance Data: Submit manufacturer's care and maintenance data, including repair and cleaning instructions. Include in project closeout documents.

1.4 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Approved by manufacturer of solid surface manufacturer with not less than 3 years experience in fabrication and installation of solid surface components of the type required for the project.

B. Material Performance: Meet or exceed NEMA LD3 test requirements for test methods 3.06 for high temperature resistance, 3.07 for cigarette resistance, 3.09 for stain and chemical resistance and 3.10 for color stability.

1. Rating: No change and no lasting effect after prescribed test exposure.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver no components to project site until areas are ready for installation. Store components indoors, in a dry well-ventilated space, before installation.

B. Handle materials to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation for duration of project.

1.6 PROJECT CONDITIONS

A. Field verify dimensions and installation conditions before proceeding with solid surface fabrications.

1.7 WARRANTY

A. Submit manufacturer's 10 year warranty against defects in materials. Warranty shall provide material and labor to repair or replace defective materials. Damage caused by physical or chemical abuse or damage from excessive heat will not be warranted.

PART 2 PRODUCTS

2.1 MATERIALS

A. Solid Surface Material: Integrally colored, solid, non-porous, homogeneous polyester and acrylic surface material.

1. Surface Burning Characteristics: 25 flame spread, 30 smoke developed, Class 1, per ASTM E 84.

2. Solid surface material unless otherwise indicated.

3. Thickness, jointing, and edge details as shown on the drawings.

4. Colors: Match existing window stool.

B. Seam Adhesive: Type recommended by the panel manufacturer, color matched to the solid surface color.

C. Perimeter Joint Sealant: Mildew-resistant, FDA/UL recognized silicone sealant, color matched to panel color.

2.2 FABRICATION

A. Allow for solid surface manufacturer’s expansion and contraction dimensions at window stools more than 12 feet in length.

B. Shop fabricate components as required and assemble into the largest possible sections to deliver to the site, ready for installation. Shop fit work that cannot be shop assembled.

C. Rout and finish component edges to a smooth, uniform finish. Repair or eject defective or inaccurate work.

D. Radius corners and edges of exposed edge surfaces to match existing.

2.3 SOURCE QUALITY CONTROL

A. Allowable Tolerances:

1. Maximum 1/8 inch from true dimensions.

2. Maximum 1/8 inch from true position.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install components plumb and level, in accordance with approved shop drawings and solid surface manufacturer's written installation details.

1. Provide work level and straight, true to alignment, accurately fit to wall conditions and securely fastened to support systems as indicated.

2. Form seams using manufacturer's recommended adhesive, with joints inconspicuous in finished work. Keep components and hands clean when making joints.

B. Keep components and hands clean during installation. Remove adhesives, sealants, and other stains. Components shall be clean on Date of Substantial Completion.

3.2 PROTECTION

A. Protect surfaces from damage until Date of Substantial Completion. Repair or replace damaged work to match adjacent surfaces as directed by Architect.

END OF SECTION

SECTION 07 90 05 - JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

1.2 RELATED REQUIREMENTS

A. Section 08 80 00 - Glazing: Glazing sealants and accessories.

B. Section 09 21 16 - Gypsum Board Assemblies: Acoustic sealant.

1.3 SYSTEM PERFORMANCE

A. Provide joint sealers produced and installed to establish and maintain watertight and airtight continuous seals.

1. Seal exterior and interior joints, cracks, and other openings within or between dissimilar materials.

1.4 SUBMITTALS

A. Product Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

B. Samples: Submit two sets of samples, 6 inches long, illustrating sealant colors for selection.

C. Test Reports: Submit compatibility and adhesion test reports indicating elastomeric sealants, joint substrates, and joint backings have been tested for compatibility and adhesion.

D. Test Reports: Submit manufacturer's product test reports showing compliance of each type of joint sealer with specified requirements.

E. Manufacturer's Installation Instructions: Indicate special procedures.

1.5 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator Qualifications: Company specializing in performing the work of this section, who has successfully completed at least three joint sealer applications similar in type and size to this project, with minimum three years experience.

D. Single Source Responsibility: Obtain joint sealer materials from a single manufacturer for each different product required.

E. Joint Conditions:

1. Widths: Do not proceed with joint sealer installation when joint widths are less than or greater than allowed by joint sealer manufacturer for the application.

2. Substrates: Do not proceed with joint sealer installation until contaminants capable of interfering with joint sealer adhesion are removed from the joint substrates.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original unopened containers or bundles with labels informing about manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions.

B. Store and handle materials in compliance with manufacturer's recommendations to prevent deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.7 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.8 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.9 WARRANTY

A. Correct defective work within a five year period after Date of Substantial Completion.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 SEALANTS

A. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses I, M, G, O, and A; multi-component, non-staining, non-bleeding, non-sagging type.

1. Acceptable Products:

a. Non-Sag Sealants: Permits application in joints on vertical surfaces without sagging or slumping.

1) Master Builders Solutions; MasterSeal NP2.

2) Bostik Inc; 915.

3) Pecora Corporation; Dynatrol II.

4) Tremco Commercial Sealants & Waterproofing; Dymeric 240FC.

2. Color: Selected by Architect from manufacturer's full range of standard and special colors.

B. Type 2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, non-staining, non-bleeding, non-sagging, paintable.

1. Acceptable Products:

a. Bostik "Chem-Calk 600".

b. Pecora "AC-20'.

c. BASF "Sonolac".

d. Tremco "Tremco Acrylic Latex 834".

2. Color: Colors as selected.

C. Type 3 - Acoustical Sealant: Butyl sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.

1. Acceptable Products:

a. Pecora "BA-98'.

b. Tremco "Tremco Acoustical Sealant".

c. USG "Sheetrock Brand Acoustical Sealant".

2. Applications: Use for concealed locations only.

D. Type 4 - Self-Leveling Polyurethane Sealant: ASTM C 920, Grade P, Class 25, Uses T, I, M, A, O; multi-component, chemical curing, non staining, non bleeding, self-leveling type.

1. Acceptable Products:

a. Pecora "Dynatred 40'.

b. Master Builders Solutions "MasterSeal SL2".

c. Tremco "THC-901".

2. Color: Gray.

E. Type 5 - Silicone Sealant: ASTM C920, Grade NS, Class 25 minimum; Uses NT, A, G, M, O; single component, neutral curing, non-sagging, non-staining, fungus resistant, non-bleeding.

1. Acceptable Products:

a. BASF "Omniplus".

b. Dow Corning "786 Mildew Resistant".

c. Pecora "898".

d. Momentive Performance Materials (GE Silicone) "Sanitary SCS1700".

e. Tremco "Tremsil 200 Sanitary".

2. Color: Color as selected.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.3 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform acoustical sealant application work in accordance with ASTM C919.

C. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION

A. Protect sealants until cured.

3.6 SCHEDULE

A. Interior Dissimilar Joints for Which No Other Sealant is Indicated: Type 2.

B. Control and Expansion Joints in Interior Concrete Slabs and Floors: Type 4.

C. Joints Between Countertops and Walls: Type 5

D. Joints Between Interior Metal Frames and Adjacent Interior Wall Work: Type 1.

E. Joints Between Interior Metal Frames and Adjacent Floor Work: Type 5.

F. In STC-Rated Walls, Between Metal Stud Track/Runner and Adjacent Construction: Type 3.

END OF SECTION

SECTION 08 11 13 - HOLLOW METAL DOOR FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hollow metal frames for wood doors.

1.2 RELATED REQUIREMENTS

A. Section 08 14 16 - Flush Wood Doors.

B. Section 08 71 00 - Door Hardware.

C. Section 09 21 16 - Gypsum Board Assemblies: Solid grout in hollow metal frames in gypsum board partitions.

D. Section 09 90 00 - Painting and Coating.

1.3 SUBMITTALS

A. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

B. Shop Drawings: Include details of each opening, showing elevations, frame profiles, installation requirements for hardware and reinforcements, joints, and connections.

1. Provide a schedule of doors and frames using the same reference numbers for details and openings as indicated on the drawings.

C. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Door frames shall comply with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI A250.8/SDI-100 and as specified.

1. Materials and methods shall meet or exceed NAAM Standard HMMA 861 of the Hollow Metal Manufacturers Association "Guide Specifications for Commercial Hollow Metal Doors and Frames" except as modified.

B. Maintain a copy of installation reference standards at the project site.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver door frames cardboard wrapped or crated to provide protection during transit and job storage.

B. Inspect door frames for damage upon delivery. Minor damage may be repaired provided refinished items are equal to new work and acceptable to Architect. Otherwise, remove damaged items and provide new items as directed.

C. Store door frames at project site under cover. Place units on minimum 4 inch high wood blocking. Protect with resilient packaging and avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Hollow Metal Door Frames:

1. Amweld Building Products.
2. Ceco Door Products.
3. Curries Company.
4. Daybar Industries.
5. Macotta Company.
6. Republic Doors.
7. Steelcraft, an Ingersoll Rand brand.

2.2 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Door Frames:

1. Steel Sheet: Cold-rolled steel complying with ASTM A1008/A1008M.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
4. Clearances: Not more than 1/8 inch at jambs and heads, except between non-fire rated pairs of doors, not more than 1/4 inch. Not more than 3/4 inch at bottom.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Frame Coating: High solids, high build, fast drying coating system meeting low VOC requirements. Acceptable products include:

1. Tnemec "Series L 69 HB Epoxoline II".

2. Tnemec "Series 115 Unibond".

3. PPG "Amerlock 2 VOC".

4. Sherwin Williams "Macropoxy 646 Fast Cure Epoxy".

D. Interior Door Frames, Non-Fire-Rated: Fully welded type,16 gauge. Provide mortar guard boxes for hardware cut-outs.

2.4 ACCESSORIES

A. Grout for Frames: Specified in Section 09 21 16.

B. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door.

C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

D. Supports and Anchors: 18 gauge sheet steel.

E. Inserts, Bolts, and Fasteners: Manufacturer's standard units.

2.5 FINISHES

A. Shop Painting, General: Clean, treat, and prime paint exposed galvanized and non-galvanized door and frame surfaces.

1. Clean steel surfaces of mill scale, rust, oil, grease, dirt, and other foreign materials before paint application.

2. Apply shop coat of prime paint of even consistency to provide a uniformly finished surface ready to receive finish paint in field.

B. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard. Apply after fabrication.

2.6 FABRICATION

A. Tolerances: Comply with SDI 117 "Manufacturing Tolerances Standard Steel Doors and Frames".

B. Hardware Preparation: Prepare door frames to receive mortised and concealed hardware, including function holes for locksets and exit devices, in accordance with final Door Hardware Schedule, templates furnished by the hardware supplier, and ANSI A 115 requirements. Hardware preparation, except surface mounted items, shall be performed in the factory.

1. Locate hardware as indicated on final shop drawings. If not included, locate in accordance with Door and Hardware Institute "Recommended Locations for Builder's Hardware on Standard Steel Doors and Frames."

2. Concealed Overhead Door Closers: Provide space, cutouts, reinforcing, and provisions for fastening in top rail of doors or head of frames as applicable.

3. Reinforce door frames to receive surface mounted hardware.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.2 PREPARATION

A. Grouted Frames: Apply frame coating over shop primed suraces on all concealed frame surfaces. Frame coating shall dry thoroughly before grouting starts.

1. Grout frames, using hand trowel methods; brace frames so pressure of grout before setting will not deform frames.

3.3 INSTALLATION

A. Install door frames in accordance with the requirements of the specified door grade standard, final shop drawings, ANSI/SDI 100.

B. Placing Frames: Comply with SDI-105 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.

1. Frames for openings over 4 feet wide shall have a vertical brace placed at the center to support frame head during installation until grouting has cured.

2. Metal Stud Partitions: Install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel stud partitions, attach wall anchors to studs with screws. Fasten floor anchors to concrete floors using expansion bolts.

3. Protect rubber silencers from damage and replace damaged units.

C. Install door hardware as specified in Section 08 71 00.

D. Touch up damaged factory finishes.

3.4 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

3.5 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Flush wood doors; flush configuration; non-rated. Transparent wood veneer faces.

B. Factory finishing.

C. Factory prefitting to frames and factory premachining for hardware.

D. Light openings.

1.2 RELATED REQUIREMENTS

A. Section 08 11 13 - Hollow Metal Door Frames.

B. Section 08 71 00 - Door Hardware.

C. Section 08 80 00 - Glazing.

1.3 SUBMITTALS

A. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

B. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, special beveling, special blocking for hardware, factory machining criteria, factory finishing criteria, identify cutouts for glazing.

C. Samples: Submit two samples of lighting opening frames, 6 inch lengths, illustrating material, type and finish .

D. Manufacturer's Installation Instructions: Indicate special installation instructions.

E. Warranty, executed in Owner's name.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with National Wood Window and Door Association (NWWDA) pamphlet "How to Store, Handle, Finish, Install, and Maintain Wood Doors", as well as the door manufacturer's instructions.

B. Accept doors on site in manufacturer's original packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges if stored more than one week. Break seal on site to permit ventilation.

D. Identify each door with a temporary, removable or concealed marking indicating individual opening number which matches the designation system on the shop drawings for door location.

1.5 PROJECT CONDITIONS

A. Coordinate the work with door opening construction, door frame and door hardware installation.

B. Do not deliver or install doors until temperature and relative humidity has been stablized and will be maintained in storage and installation areas in accordance with AWI Quality Standards, including Section 100-S-11 "Moisture Content".

1.6 WARRANTY

A. Interior Doors: Provide manufacturer's warranty for the life of the installation.

1. Warranty shall include reinstallation that may be required due to repair or replacement of defective doors where defect was not apparant before hanging.

2. Contractor shall replace or refinish doors when Contractor or installer's work contributed to rejection or voiding of manufacturer's warranty.

B. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Wood Veneer Faced Doors:

1. Masonite Architectural (formerly Marshfield/Algoma).

2. Oshkosh Architectural Door Co.

3. VT Industries, Inc.

2.2 DOORS

A. Doors: See drawings for locations and additional requirements.

1. Wood Veneer Faced Doors: 5-ply construction, bonded construction.

B. Interior Doors: 1-3/4 inches thick unless otherwise indicated; flush construction.

1. Provide solid core doors at all locations.

2. Wood veneer facing with factory transparent finish as indicated on drawings.

2.3 DOOR AND PANEL CORES

A. Non-Rated Solid Core Doors: Type particleboard core (PC), plies and faces as indicated.

2.4 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Species to match existing, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.

1. Vertical Edges: Same species as face veneer.

B. Facing Adhesive: Type I - waterproof.

2.5 ACCESSORIES

A. Glazing Stops: Wood, of same species as door facing, same species as door veneer, mitered corners; prepared for countersink style tamper proof screws.

2.6 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores: Constructed with stiles and rails.

C. Provide solid blocks at lock edge and top of door for closer for hardware reinforcement.

1. Provide solid blocking for other throughbolted hardware.

D. Fit door edge trim to edge of stiles after applying veneer facing.

E. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

F. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with AWI tolerance requirements.

1. Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before proceeding with factory premachining.

G. Provide edge clearances in accordance with AWI Quality Standards Illustrated Section 1700.

2.7 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI quality standards, including Section 1500 "Factory Finishing".

1. Transparent: Manufacturer's standard factory finishing system equal to or better than AWI "Post-Catalyzed Polyurethane" finish system high solids, non-VOC, UV cured system. Premium Grade.

a. Stain: Match existing doors.

B. Factory finish doors in accordance with approved sample.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.2 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

1. Hang doors straight, plumb and square, securely anchored into position. Adjust doors to provide uniform clearance and to contact stops uniformly. Remove and replace doors that are warped, bowed, or otherwise damaged and cannot be properly fit to the opening.

2. Fit doors to frames for uniform clearance at each edge.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.3 TOLERANCES

A. Installation Tolerances:

1. Maximum Diagonal Distortion (Warp): 1/4 inch measured with straight edge or taut string, corner to corner, over an imaginary 36 by 84 inches surface area.

2. Maximum Vertical Distortion (Bow): 1/4 inch measured with straight edge or taut string, top to bottom, over an imaginary 36 by 84 inches surface area.

3. Maximum Width Distortion (Cup): 1/4 inch measured with straight edge or taut string, edge to edge, over an imaginary 36 by 84 inches surface area.

3.4 ADJUSTING

A. Adjust doors for smooth and balanced door movement. Rehang or replace doors that do not swing or operate freely. Doors with closers shall latch under the power of the closer.

B. Adjust closers for full closure.

END OF SECTION

SECTION 08 43 13 - ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Aluminum-framed storefront, with vision glass.

B. Aluminum doors and frames.

1.2 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware: Hardware items other than specified in this section.

B. Section 08 80 00 - Glazing: Glass and glazing accessories.

1.3 SUBMITTALS

A. Product Data: Submit component dimensions, describe components within assembly, anchorage and fasteners, glass, door hardware, accessories, and finishes.

B. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required. Include the following:

1. Layout and installation details, including relationship to adjacent work.

2. Elevations at 1/4 inch scale.

3. Detail sections of typical composite members.

4. Anchors and reinforcement.

5. Hardware mounting heights.

6. Glazing details.

C. Design Data: Submit framing member structural and physical characteristics, engineering calculations, and dimensional limitations.

D. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

E. Samples: When requested, submit two samples 12 inches x 12 inches in size illustrating finished aluminum surface, glass, and glazing materials.

F. Manufacturer's Certificate: Certify that the products supplied meet or exceed the specified requirements.

G. Test Reports: Submit certified test reports from a qualified independent testing laboratory showing storefront systems have been tested in accordance with specified test procedures and comply with performance characteristics indicated.

H. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in Ohio.

B. Installer Qualifications: Company specialzing in installing storefront systems with a minimum of five years of documented experience.

C. Fabricator Qualifications: Company specializing in fabricating storefront systems with a minimum of five years of documented experience. Fabricator shall have sufficient production capacity to produce components required for the project without causing a delay.

D. Single Source Responsibility: Obtain storefront systems and entrances from one source and a single manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

1. Store components in a clean, dry location.

2. Stack framing components to prevent bending and avoid permanent damage.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.6 PROJECT CONDITIONS

A. Field verify dimensions of other construction before fabricating storefront components. Show recorded measurements on shop drawings.

1. When field verifying measurements will delay the work, guarantee dimensions and proceed with fabrication of storefront items. Coordinate construction of adjacent surfaces and components to make sure actual dimensions match dimensions guaranteed without field verification.

1.7 WARRANTY

A. Correct defective Work within a five year period after Date of Substantial Completion. Defects include faulty operation; structural failures, including excessive deflection, leakage or air infiltration; deterioration of metals, metal finishes, and other materials beyond normal weathering.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Aluminum-Framed Storefront and Doors:

1. EFCO Corporation.
2. Kawneer North America.
3. Oldcastle BuildingEnvelope.
4. Tubelite, Inc.
5. Trulite Glass & Aluminum Solutions, LLC.
6. YKK AP America Inc.

2.2 ALUMINUM-FRAMED STOREFRONT

A. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, anchorage, and attachment devices.

1. Glazing Position: As indicated on the drawings.
2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
3. 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, anchorages, and other building elements.
4. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
5. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

2.3 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, drainage holes and internal weep drainage system.

1. Glazing Stops: Flush.
2. Cross-Section: As indicated on drawings.

B. Doors: Glazed aluminum, Stile dimensions as shown on the drawings. Fabricate mechanical joints using heavy inserted reinforcing plates and concealed tie-rods or j-bolts.

1. Thickness: 1-3/4 inches.
2. Glazing Stops: Snap-on extruded aluminum. Anchor exterior stops for non-removal.
3. Finish: Same as storefront.

2.4 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209 (ASTM B209M).

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Brackets and Reinforcements: High strength aluminum. When use of aluminum is not feasible, provide non-magnetic stainless steel or hot-dip galvanized steel complying with ASTM A 123.

E. Exposed Flashings: Aluminum sheet, 20 gauge, 0.032 inch minimum thickness; finish to match framing members.

F. Concealed Flashings: Minimum 0.026 inch thick aluminum or 0.018 inch dead-soft stainless steel.

G. Glass: As specified in Section 08 8000.

H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

I. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.5 FINISHES

A. Superior Performance Organic Coating System: AAMA 2605 multiple coat, thermally cured polyvinylidene fluoride system; color as selected from manufacturer's standard colors.

B. Touch-Up Materials: As recommended by coating manufacturer for field application.

2.6 HARDWARE

A. Refer to Section 08 71 00 for hardware requirements in addition to those items indicated to be provided by the aluminum entrance manufacturer.

2.7 FABRICATION

A. Accurately fit and secure joints and corners. Make joints flush, hairline, and weatherproof.

B. Prepare components to receive anchor devices. Fabricate anchors.

C. Arrange fasteners and attachments to conceal from view.

D. Finishing: Apply factory finish to all surfaces that will be exposed in completed assemblies.

1. Touch-up surfaces cut during fabrication so that no natural aluminum is visible in completed assemblies, including joint edges.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that wall openings and adjoining air and vapor seal materials are ready to receive work of this section.

3.2 INSTALLATION

A. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

B. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

C. Separate aluminum and other corrodible metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

1. Zinc or cadmium plated steel anchors and other unexposed fasteners after fabrication.

2. Paint aluminum surfaces in contact with mortar, concrete or other masonry with alkali resistant coating.

D. Install glass in accordance with Section 08 80 00.

E. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.3 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet non-cumulative or 0.06 inch per 10 feet, whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch.

C. Diagonal Measurements: Maximum different in diagonal measurements shall not exceed 1/8 inch.

D. Offset at Corners: Maximum out-of-plane offset of framing at corners shall not exceed 1/32 inch.

3.4 ADJUSTING

A. Adjust operating hardware for smooth operation.

3.5 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

B. Clean glass surfaces in accordance with Section 08800 requirements.

3.6 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 71 00 - DOOR HARDWARE

1. PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:
   1. Mechanical and electrified door hardware
   2. Electronic access control system components

B. Section excludes:
   1. Windows
   2. Cabinets (casework), including locks in cabinets
   3. Signage
   4. Toilet accessories
   5. Overhead doors

C. Related Sections:
   1. Division 01 Section "Alternates" for alternates affecting this section.
   2. Division 06 Section "Rough Carpentry"
   3. Division 06 Section "Finish Carpentry"
   4. Division 07 Section "Joint Sealants" for sealant requirements applicable to threshold installation specified in this section.
   5. Division 08 Sections:
      a. "Metal Doors and Frames"
      b. "Flush Wood Doors"
      c. "Stile and Rail Wood Doors"
      d. "Interior Aluminum Doors and Frames"
      e. "Aluminum-Framed Entrances and Storefronts"
   6. Division 26 "Electrical" sections for connections to electrical power system and for low-voltage wiring.
   7. Division 28 "Electronic Safety and Security" sections for coordination with other components of electronic access control system and fire alarm system.

1.2 REFERENCES

A. UL LLC
   1. UL 10B - Fire Test of Door Assemblies
   2. UL 10C - Positive Pressure Test of Fire Door Assemblies
   3. UL 1784 - Air Leakage Tests of Door Assemblies
   4. UL 305 - Panic Hardware

B. DHI - Door and Hardware Institute
   1. Sequence and Format for the Hardware Schedule
   2. Recommended Locations for Builders Hardware
   3. Keying Systems and Nomenclature
   4. Installation Guide for Doors and Hardware

C. NFPA – National Fire Protection Association

1. NFPA 70 – National Electric Code
2. NFPA 80 – 2016 Edition – Standard for Fire Doors and Other Opening Protectives
3. NFPA 101 – Life Safety Code
4. NFPA 105 – Smoke and Draft Control Door Assemblies
5. NFPA 252 – Fire Tests of Door Assemblies

D. ANSI - American National Standards Institute
1. ANSI A117.1 – 2017 Edition – Accessible and Usable Buildings and Facilities
2. ANSI/BHMA A156.1 - A156.29, and ANSI/BHMA A156.31 - Standards for Hardware and Specialties
3. ANSI/BHMA A156.28 - Recommended Practices for Keying Systems
4. ANSI/WDMA I.S. 1A - Interior Architectural Wood Flush Doors
5. ANSI/SDI A250.8 - Standard Steel Doors and Frames

1.3 SUBMITTALS

A. General:
1. Submit in accordance with Conditions of Contract and Division 01 Submittal Procedures.
2. Prior to forwarding submittal:
   a. Review drawings and Sections from related trades to verify compatibility with specified hardware.
   b. Highlight, encircle, or otherwise specifically identify on submittals: deviations from Contract Documents, issues of incompatibility or other issues which may detrimentally affect the Work.

B. Action Submittals:
1. Product Data: Submit technical product data for each item of door hardware, installation instructions, maintenance of operating parts and finish, and other information necessary to show compliance with requirements.
2. Riser and Wiring Diagrams: After final approval of hardware schedule, submit details of electrified door hardware, indicating:
   a. Wiring Diagrams: For power, signal, and control wiring and including:
      1) Details of interface of electrified door hardware and building safety and security systems.
      2) Schematic diagram of systems that interface with electrified door hardware.
      3) Point-to-point wiring.
      4) Risers.
3. Samples for Verification: If requested by Architect, submit production sample of requested door hardware unit in finish indicated and tagged with full description for coordination with schedule.
   a. Samples will be returned to supplier. Units that are acceptable to Architect may, after final check of operations, be incorporated into Work, within limitations of key coordination requirements.
4. Door Hardware Schedule:
   a. Submit concurrent with submissions of Product Data, Samples, and Shop Drawings. Coordinate submission of door hardware schedule with scheduling requirements of other work to facilitate fabrication of other work critical in Project construction schedule.
   b. Submit under direct supervision of a Door Hardware Institute (DHI) certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) with hardware sets in vertical format as illustrated by Sequence of Format for the Hardware Schedule published by DHI.
   c. Indicate complete designations of each item required for each opening, include:

1) Door Index: door number, heading number, and Architect's hardware set number.
2) Quantity, type, style, function, size, and finish of each hardware item.
3) Name and manufacturer of each item.
4) Fastenings and other pertinent information.
5) Location of each hardware set cross-referenced to indications on Drawings.
6) Explanation of all abbreviations, symbols, and codes contained in schedule.
7) Mounting locations for hardware.
8) Door and frame sizes and materials.
9) Degree of door swing and handing.
10) Operational Description of openings with electrified hardware covering egress, ingress (access), and fire/smoke alarm connections.

5. Key Schedule:
   a. After Keying Conference, provide keying schedule that includes levels of keying, explanations of key system's function, key symbols used, and door numbers controlled.
   b. Use ANSI/BHMA A156.28 "Recommended Practices for Keying Systems" as guideline for nomenclature, definitions, and approach for selecting optimal keying system.
   c. Provide 3 copies of keying schedule for review prepared and detailed in accordance with referenced DHI publication. Include schematic keying diagram and index each key to unique door designations.
   d. Index keying schedule by door number, keyset, hardware heading number, cross keying instructions, and special key stamping instructions.
   e. Provide one complete bitting list of key cuts and one key system schematic illustrating system usage and expansion. Forward bitting list, key cuts and key system schematic directly to Owner, by means as directed by Owner.
   f. Prepare key schedule by or under supervision of supplier, detailing Owner's final keying instructions for locks.

C. Informational Submittals:

1. Provide Qualification Data for Supplier, Installer and Architectural Hardware Consultant.
2. Provide Product Data:
   a. Certify that door hardware approved for use on types and sizes of labeled fire-rated doors complies with listed fire-rated door assemblies.
   b. Include warranties for specified door hardware.

D. Closeout Submittals:

1. Operations and Maintenance Data: Provide in accordance with Division 01 and include:
   a. Complete information on care, maintenance, and adjustment; data on repair and replacement parts, and information on preservation of finishes.
   b. Catalog pages for each product.
   c. Final approved hardware schedule edited to reflect conditions as installed.
   d. Final keying schedule
   e. Copy of warranties including appropriate reference numbers for manufacturers to identify project.
   f. As-installed wiring diagrams for each opening connected to power, both low voltage and 110 volts.

E. Inspection and Testing:

1. Submit written reports to the Owner and Authority Having Jurisdiction (AHJ) of the results of functional testing and inspection for:
   a. Fire door assemblies, in compliance with NFPA 80.
   b. Required egress door assemblies, in compliance with NFPA 101.

1.4 QUALITY ASSURANCE

A. Qualifications and Responsibilities:

1. Supplier: Recognized architectural hardware supplier with a minimum of 5 years documented experience supplying both mechanical and electromechanical door hardware similar in quantity, type, and quality to that indicated for this Project. Supplier to be recognized as a factory direct distributor by the manufacturer of the primary materials with a warehousing facility in the Project's vicinity. Supplier to have on staff, a certified Architectural Hardware Consultant (AHC) or Door Hardware Consultant (DHC) available to Owner, Architect, and Contractor, at reasonable times during the Work for consultation.
2. Installer: Qualified tradesperson skilled in the application of commercial grade hardware with experience installing door hardware similar in quantity, type, and quality as indicated for this Project.
3. Architectural Hardware Consultant: Person who is experienced in providing consulting services for door hardware installations that are comparable in material, design, and extent to that indicated for this Project and meets these requirements:
    a. For door hardware: DHI certified AHC or DHC.
    b. Can provide installation and technical data to Architect and other related subcontractors.
    c. Can inspect and verify components are in working order upon completion of installation.
    d. Capable of producing wiring diagram and coordinating installation of electrified hardware with Architect and electrical engineers.
4. Single Source Responsibility: Obtain each type of door hardware from single manufacturer.

B. Certifications:
1. Fire-Rated Door Openings:
    a. Provide door hardware for fire-rated openings that complies with NFPA 80 and requirements of authorities having jurisdiction.
    b. Provide only items of door hardware that are listed products tested by UL LLC, Intertek Testing Services, or other testing and inspecting organizations acceptable to authorities having jurisdiction for use on types and sizes of doors indicated, based on testing at positive pressure and according to NFPA 252 or UL 10C and in compliance with requirements of fire-rated door and door frame labels.
2. Smoke and Draft Control Door Assemblies:
    a. Provide door hardware that meets requirements of assemblies tested according to UL 1784 and installed in compliance with NFPA 105
    b. Comply with the maximum air leakage of 0.3 cfm/sq. ft. (3 cu. m per minute/sq. m) at tested pressure differential of 0.3-inch wg (75 Pa) of water.
3. Electrified Door Hardware
    a. Listed and labeled as defined in NFPA 70, Article 100, by testing agency acceptable to authorities having jurisdiction.
4. Accessibility Requirements:
    a. Comply with governing accessibility regulations cited in "REFERENCES" article 087100, 1.02.D3 herein for door hardware on doors in an accessible route. This project must comply with all Federal Americans with Disability Act regulations and all Local Accessibility Regulations.

C. Pre-Installation Meetings
1. Keying Conference
    a. Incorporate keying conference decisions into final keying schedule after reviewing door hardware keying system including:
        1) Function of building, flow of traffic, purpose of each area, degree of security required, and plans for future expansion.
        2) Preliminary key system schematic diagram.
        3) Requirements for key control system.
        4) Requirements for access control.
        5) Address for delivery of keys.
2. Pre-installation Conference

a. Review and finalize construction schedule and verify availability of materials, Installer's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Inspect and discuss preparatory work performed by other trades.
c. Inspect and discuss electrical roughing-in for electrified door hardware.
d. Review sequence of operation for each type of electrified door hardware.
e. Review required testing, inspecting, and certifying procedures.
f. Review questions or concerns related to proper installation and adjustment of door hardware.

3. Electrified Hardware Coordination Conference:
   a. Prior to ordering electrified hardware, schedule and hold meeting to coordinate door hardware with security, electrical, doors and frames, and other related suppliers.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up for hardware delivered to Project site. Promptly replace products damaged during shipping.

B. Tag each item or package separately with identification coordinated with final door hardware schedule, and include installation instructions, templates, and necessary fasteners with each item or package. Deliver each article of hardware in manufacturer's original packaging.

C. Maintain manufacturer-recommended environmental conditions throughout storage and installation periods.

D. Provide secure lock-up for door hardware delivered to Project. Control handling and installation of hardware items so that completion of Work will not be delayed by hardware losses both before and after installation.

E. Handle hardware in manner to avoid damage, marring, or scratching. Correct, replace or repair products damaged during Work. Protect products against malfunction due to paint, solvent, cleanser, or any chemical agent.

F. Deliver keys to manufacturer of key control system for subsequent delivery to Owner.

1.6 COORDINATION

A. Coordinate layout and installation of floor-recessed door hardware with floor construction. Cast anchoring inserts into concrete.

B. Installation Templates: Distribute for doors, frames, and other work specified to be factory or shop prepared. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing door hardware to comply with indicated requirements.

C. Security: Coordinate installation of door hardware, keying, and access control with Owner's security consultant.

D. Electrical System Roughing-In: Coordinate layout and installation of electrified door hardware with connections to power supplies and building safety and security systems.

1.7 WARRANTY

A. Manufacturer's standard form in which manufacturer agrees to repair or replace components of door hardware that fail in materials or workmanship within published warranty period.

1. Warranty does not cover damage or faulty operation due to improper installation, improper use or abuse.
2. Warranty Period: Beginning from date of Substantial Completion, for durations indicated in manufacturer's published listings.
   a. Mechanical Warranty

1) Locks
    a) 2 Point Latching: 3 years
    b) Cylindrical: 10 years
2) Closers
    c) LCN 4000 Series: 30 years

b. Electrical Warranty
1) Locks
    a) 1 year

1.8 MAINTENANCE

A. Furnish complete set of special tools required for maintenance and adjustment of hardware, including changing of cylinders.

B. Turn over unused materials to Owner for maintenance purposes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. The Owner requires use of certain products for their unique characteristics and project suitability to ensure continuity of existing and future performance and maintenance standards. After investigating available product offerings, the Awarding Authority has elected to prepare proprietary specifications. These products are specified with the notation: "No Substitute."
    1. Where "No Substitute" is noted, submittals and substitution requests for other products will not be considered.

B. Approval of manufacturers and/or products other than those listed as "Scheduled Manufacturer" or "Acceptable Manufacturers" in the individual article for the product category shall be in accordance with QUALITY ASSURANCE article, herein.

C. Approval of products from manufacturers indicated in "Acceptable Manufacturers" is contingent upon those products providing all functions and features and meeting all requirements of scheduled manufacturer's product.

D. Where specified hardware is not adaptable to finished shape or size of members requiring hardware, furnish suitable types having same operation and quality as type specified, subject to Architect's approval.

2.2 MATERIALS

A. Fabrication
    1. Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. provide screws according to manufacturer’s recognized installation standards for application intended.
    2. Finish exposed screws to match hardware finish, or, if exposed in surfaces of other work, to match finish of this other work including prepared for paint surfaces to receive painted finish.
    3. Provide concealed fasteners wherever possible for hardware units exposed when door is closed. Coordinate with “Metal Doors and Frames”, “Flush Wood Doors”, “Stile and Rail Wood Doors” to ensure proper reinforcements. Advise the Architect where visible fasteners, such as thru bolts, are required.

B. Provide screws, bolts, expansion shields, drop plates and other devices necessary for hardware installation.
    1. Where fasteners are exposed to view: Finish to match adjacent door hardware material.

C. Cable and Connectors:

1. Where scheduled in the hardware sets, provide each item of electrified hardware and wire harnesses with number and gage of wires enough to accommodate electric function of specified hardware.
2. Provide Molex connectors that plug directly into connectors from harnesses, electric locking and power transfer devices.
3. Provide through-door wire harness for each electrified locking device installed in a door and wire harness for each electrified hinge, electrified continuous hinge, electrified pivot, and electric power transfer for connection to power supplies.

2.3 HINGES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Ives 5BB series
2. Acceptable Manufacturers and Products:
   a. McKinney TB series
   b. Stanley FBB series

B. Requirements:

1. Provide hinges conforming to ANSI/BHMA A156.1.
2. Provide five knuckle, ball bearing hinges.
3. 1-3/4 inch (44 mm) thick doors, up to and including 36 inches (914 mm) wide:
   a. Exterior: Standard weight, bronze or stainless steel, 4-1/2 inches (114 mm) high
   b. Interior: Standard weight, steel, 4-1/2 inches (114 mm) high
4. 1-3/4 inch (44 mm) thick doors over 36 inches (914 mm) wide:
   a. Exterior: Heavy weight, bronze/stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
5. 2 inches or thicker doors:
   a. Exterior: Heavy weight, bronze or stainless steel, 5 inches (127 mm) high
   b. Interior: Heavy weight, steel, 5 inches (127 mm) high
6. Adjust hinge width for door, frame, and wall conditions to allow proper degree of opening.
7. Provide three hinges per door leaf for doors 90 inches (2286 mm) or less in height, and one additional hinge for each 30 inches (762 mm) of additional door height.
8. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
   a. Steel Hinges: Steel pins
   b. Non-Ferrous Hinges: Stainless steel pins
   c. Out-Swinging Exterior Doors: Non-removable pins
   d. Out-Swinging Interior Lockable Doors: Non-removable pins
   e. Interior Non-lockable Doors: Non-rising pins
9. Provide hinges with electrified options as scheduled in the hardware sets. Provide with number and gage of wires enough to accommodate electric function of specified hardware. Locate electric hinge at second hinge from bottom or nearest to electrified locking component. Provide mortar guard for each electrified hinge specified.

2.4 TWO-POINT LOCK

A. Manufacturer and Product:

1. Scheduled Manufacturer and Product:
   a. Schlage LM9200
2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide concealed two-point locking system for use in pair wood door applications manufactured from heavy gauge steel, containing components of steel with a zinc dichromate plating for corrosion resistance. Provide lock case that is multi-function and field reversible for handing without opening case. Cylinders: Refer to "KEYING" article, herein.
2. Concealed Vertical Locking Devices: Vertical latch system in two-point for non-rated or fire rated wood doors up to a 45-minute rating and less bottom latch (LBL) configuration for non-rated or fire rated wood doors up to 20-minute rating.
3. Provide electrified lockset functions as scheduled in the hardware sets.
4. Lever Trim: Solid brass, bronze, or stainless steel, cast or forged in design specified, with wrought roses or escutcheon as scheduled and external lever spring cages. Provide escutcheon trim which does not require the use of a backer plate in wood door applications. Provide thru-bolted levers with 2-piece spindles.

2.5 CYLINDRICAL LOCKS – GRADE 1

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage ND series
2. Acceptable Manufacturers and Products:
   a. No Substitute

B. Requirements:

1. Provide cylindrical locks conforming to ANSI/BHMA A156.2 Series 4000, Grade 1, and UL Listed for 3-hour fire doors.
2. Cylinders: Refer to "KEYING" article, herein.
3. Provide locks with standard 2-3/4 inches (70 mm) backset, unless noted otherwise, with 1/2-inch latch throw. Provide proper latch throw for UL listing at pairs.
4. Provide locksets with separate anti-rotation thru-bolts, and no exposed screws.
5. Provide independently operating levers with two external return spring cassettes mounted under roses to prevent lever sag.
6. Provide standard ASA strikes unless extended lip strikes are necessary to protect trim.
7. Provide electrified options as scheduled in the hardware sets.
8. Lever Trim: Solid cast levers without plastic inserts and wrought roses on both sides.

2.6 POWER SUPPLIES

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. Schlage/Von Duprin PS900 Series
2. Acceptable Manufacturers and Products:
   a. Precision ELR series
   b. Securitron BPS series

B. Requirements:

1. Provide power supplies approved by manufacturer of supplied electrified hardware.
2. Provide appropriate quantity of power supplies necessary for proper operation of electrified locking components as recommended by manufacturer of electrified locking components with consideration for each electrified component using power supply, location of power supply, and approved wiring diagrams. Locate power supplies as directed by Architect.
3. Provide regulated and filtered 24 VDC power supply, and UL class 2 listed.

4. Provide power supplies with the following features:
    a. 12/24 VDC Output, field selectable.
    b. Class 2 Rated power limited output.
    c. Universal 120-240 VAC input.
    d. Low voltage DC, regulated and filtered.
    e. Polarized connector for distribution boards.
    f. Fused primary input.
    g. AC input and DC output monitoring circuit w/LED indicators.
    h. Cover mounted AC Input indication.
    i. Tested and certified to meet UL294.
    j. NEMA 1 enclosure.
    k. Hinged cover w/lock down screws.
    l. High voltage protective cover.

2.7 CYLINDERS

A. Manufacturers:
    1. Scheduled Manufacturer and Product:
        a. Match existing key system
    2. Acceptable Manufacturers and Products:
        a. No Substitute

B. Requirements:
    1. Provide cylinders/cores to match Owner's existing key system, compliant with ANSI/BHMA A156.5; latest revision; cylinder face finished to match lockset, manufacturer's series as indicated. Refer to "KEYING" article, herein.

2.8 KEYING

A. Scheduled System:
    1. Existing non-factory registered system:
        a. Provide cylinders/cores keyed into Owner's existing keying system managed by Owner's locksmith, complying with guidelines in ANSI/BHMA A156.28, incorporating decisions made at keying conference.
            1) Coordinate with Owner for keying information

B. Requirements:
    1. Construction Keying:
        a. Replaceable Construction Cores.
            1) Provide temporary construction cores replaceable by permanent cores, furnished in accordance with the following requirements.
                a) 3 construction control keys
                b) 12 construction change (day) keys.
            2) Owner or Owner's Representative will replace temporary construction cores with permanent cores.
    2. Permanent Keying:
        a. Provide permanent cylinders/cores keyed by the manufacturer according to the following key system.
            1) Master Keying system as directed by the Owner.
        b. Forward bitting list and keys separately from cylinders, by means as directed by Owner. Failure to comply with forwarding requirements will be cause for replacement of cylinders/cores involved at no additional cost to Owner.
        c. Provide keys with the following features:
            1) Material: Nickel silver; minimum thickness of .107-inch (2.3mm)
            2) Patent Protection: Keys and blanks protected by one or more utility patent(s).
        d. Identification:

1) Mark permanent cylinders/cores and keys with applicable blind code for identification. Do not provide blind code marks with actual key cuts.
2) Identification stamping provisions must be approved by the Architect and Owner.
3) Stamp cylinders/cores and keys with Owner's unique key system facility code as established by the manufacturer; key symbol and embossed or stamped with "DO NOT DUPLICATE" along with the "PATENTED" or patent number to enforce the patent protection.
4) Failure to comply with stamping requirements will be cause for replacement of keys involved at no additional cost to Owner.
5) Forward permanent cylinders/cores to Owner, separately from keys, by means as directed by Owner.

e. Quantity: Furnish in the following quantities.
1) Change (Day) Keys: 3 per cylinder/core.
2) Permanent Control Keys: 3.
3) Master Keys: 6.

2.9 DOOR CLOSERS

A. Manufacturers and Products:

1. Scheduled Manufacturer and Product:
   a. LCN 4050A series
2. Acceptable Manufacturers and Products:
   a. Falcon SC70A series
   b. Norton 7500 series

B. Requirements:

1. Provide door closers conforming to ANSI/BHMA A156.4 Grade 1 requirements by BHMA certified independent testing laboratory. ISO 9000 certify closers. Stamp units with date of manufacture code.
2. Provide door closers with fully hydraulic, full rack and pinion action with cast aluminum cylinder.
3. Closer Body: 1-1/2-inch (38 mm) diameter with 11/16-inch (17 mm) diameter heat-treated pinion journal and full complement bearings.
4. Hydraulic Fluid: Fireproof, passing requirements of UL10C, and all weather requiring no seasonal closer adjustment for temperatures ranging from 120 degrees F to -30 degrees F.
5. Spring Power: Continuously adjustable over full range of closer sizes, and providing reduced opening force as required by accessibility codes and standards.
6. Hydraulic Regulation: By tamper-proof, non-critical valves, with separate adjustment for latch speed, general speed, and back check.
7. Pressure Relief Valve (PRV) Technology: Not permitted.
8. Provide stick on templates, special templates, drop plates, mounting brackets, or adapters for arms as required for details, overhead stops, and other door hardware items interfering with closer mounting.

2.10 PROTECTION PLATES

A. Manufacturers:

1. Scheduled Manufacturer:
   a. Ives
2. Acceptable Manufacturers:
   a. Burns
   b. Trimco

B. Requirements:

1. Provide protection plates with a minimum of 0.050 inch (1 mm) thick, beveled four edges as scheduled. Furnish with sheet metal or wood screws, finished to match plates.
2. Sizes plates 2 inches (51 mm) less width of door on single doors, pairs of doors with a mullion, and doors with edge guards. Size plates 1 inch (25 mm) less width of door on pairs without a mullion or edge guards.
3. At fire rated doors, provide protection plates over 16 inches high with UL label.

2.11 OVERHEAD STOPS AND OVERHEAD STOP/HOLDERS

A. Manufacturers:
   1. Scheduled Manufacturers:
      a. Glynn-Johnson
   2. Acceptable Manufacturers:
      a. Rixson
      b. Sargent

B. Requirements:
   1. Provide overhead stop at any door where conditions do not allow for a wall stop or floor stop presents tripping hazard.
   2. Provide friction type at doors without closer and positive type at doors with closer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to installation of hardware, examine doors and frames, with Installer present, for compliance with requirements for installation tolerances, labeled fire-rated door assembly construction, wall and floor construction, and other conditions affecting performance. Verify doors, frames, and walls have been properly reinforced for hardware installation.

B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before electrified door hardware installation.

C. Submit a list of deficiencies in writing and proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Mount door hardware units at heights to comply with the following, unless otherwise indicated or required to comply with governing regulations.
   1. Standard Steel Doors and Frames: ANSI/SDI A250.8.
   2. Custom Steel Doors and Frames: HMMA 831.
   3. Interior Architectural Wood Flush Doors: ANSI/WDMA I.S. 1A
   4. Installation Guide for Doors and Hardware: DHI TDH-007-20

B. Install door hardware in accordance with NFPA 80, NFPA 101 and provide post-install inspection, testing as specified in section 1.03.E unless otherwise required to comply with governing regulations.

C. Install each hardware item in compliance with manufacturer's instructions and recommendations, using only fasteners provided by manufacturer.

D. Do not install surface mounted items until finishes have been completed on substrate. Protect all installed hardware during painting.

E. Set units level, plumb and true to line and location. Adjust and reinforce attachment substrate as necessary for proper installation and operation.

F. Drill and countersink units that are not factory prepared for anchorage fasteners. Space fasteners and anchors according to industry standards.

G. Install operating parts so they move freely and smoothly without binding, sticking, or excessive clearance.

H. Hinges: Install types and in quantities indicated in door hardware schedule but not fewer than quantity recommended by manufacturer for application indicated.

I. Lock Cylinders:
   1. Install construction cores to secure building and areas during construction period.
   2. Replace construction cores with permanent cores as indicated in keying section.
   3. Furnish permanent cores to Owner for installation.

J. Wiring: Coordinate with Division 26, ELECTRICAL and Division 28 ELECTRONIC SAFETY AND SECURITY sections for:
   1. Conduit, junction boxes and wire pulls.
   2. Connections to and from power supplies to electrified hardware.
   3. Connections to fire/smoke alarm system and smoke evacuation system.
   4. Connection of wire to door position switches and wire runs to central room or area, as directed by Architect.
   5. Connections to panel interface modules, controllers, and gateways.
   6. Testing and labeling wires with Architect's opening number.

K. Door Closers: Mount closers on room side of corridor doors, inside of exterior doors, and stair side of stairway doors from corridors. Mount closers so they are not visible in corridors, lobbies and other public spaces unless approved by Architect.

L. Closer/Holders: Mount closer/holders on room side of corridor doors, inside of exterior doors, and stair side of stairway doors.

M. Power Supplies: Locate power supplies as indicated or, if not indicated, above accessible ceilings or in equipment room, or alternate location as directed by Architect.

N. Thresholds: Set thresholds in full bed of sealant complying with requirements specified in Division 07 Section "Joint Sealants."

O. Stops: Provide floor stops for doors unless wall or other type stops are indicated in door hardware schedule. Do not mount floor stops where they may impede traffic or present tripping hazard.

P. Perimeter Gasketing: Apply to head and jamb, forming seal between door and frame.

Q. Meeting Stile Gasketing: Fasten to meeting stiles, forming seal when doors are closed.

R. Door Bottoms and Sweeps: Apply to bottom of door, forming seal with threshold when door is closed.

3.3 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

1. Spring Hinges: Adjust to achieve positive latching when door can close freely from an open position of 30 degrees.
2. Electric Strikes: Adjust horizontal and vertical alignment of keeper to properly engage lock bolt.
3. Door Closers: Adjust sweep period to comply with accessibility requirements and requirements of authorities having jurisdiction.

B. Occupancy Adjustment: Approximately three to six months after date of Substantial Completion, examine and readjust each item of door hardware, including adjusting operating forces, as necessary to ensure function of doors and door hardware.

3.4 CLEANING AND PROTECTION

A. Clean adjacent surfaces soiled by door hardware installation.

B. Clean operating items per manufacturer's instructions to restore proper function and finish.

C. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of Substantial Completion.

3.5 DOOR HARDWARE SCHEDULE

A. The intent of the hardware specification is to specify the hardware for interior and exterior doors, and to establish a type, continuity, and standard of quality. However, it is the door hardware supplier's responsibility to thoroughly review existing conditions, schedules, specifications, drawings, and other Contract Documents to verify the suitability of the hardware specified.

B. Discrepancies, conflicting hardware, and missing items are to be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application.

C. Hardware items are referenced in the following hardware schedule. Refer to the above specifications for special features, options, cylinders/keying, and other requirements.

D. Hardware Sets:

83248 OPT0303872 Version 1

Hardware Group No. 01

Provide each SGL door(s) with the following:

2	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
1	EA	ELECTRIC HINGE	5BB1 4.5 X 4.5 CON TW8	652	IVE
1	EA	EU STOREROOM LOCK	ND80TDEU RHO RX CON 12V/24V DC	626	SCH
1	EA	FSIC CORE	23-030 **MATCH OWNERS EXISTING SYSTEM	626	SCH
1	EA	OH STOP	100S	630	GLY
1	EA	SURFACE CLOSER	4050A REG	689	LCN
1	EA	MOUNTING PLT	4050A-18 ST-5203	689	LCN
1	EA	KICK PLATE	8400 8" X 2" LDW B-CS	US32D	IVE
1	EA	WIRE HARNESS	CON-XX (LENGTH AS REQ)		SCH
1	EA	WIRE HARNESS	CON-6W		SCH
1	EA	MULTITECH READER	MTB11/MTB15 - (PROVIDED BY OTHERS)	BLK	SCE
1	EA	POWER SUPPLY	PS902 120/240 VAC	LGR	SCE

DOOR NORMALLY CLOSED AND LOCKED. PRESENTING VALID CREDENTIAL TO READER MOMENTARILY UNLOCKS OUTSIDE LEVER ALLOWING ENTRY. FREE EGRESS AT ALL TIMES.

Hardware Group No. 02

Provide each PR door(s) with the following:

6	EA	HINGE	5BB1 4.5 X 4.5	652	IVE
2	EA	TWO PT CLASSRM LOCK	LM9270T 06A LBL	626	SCH
2	EA	FSIC CORE	23-030 **MATCH OWNERS EXISTING SYSTEM	626	SCH
2	EA	OH STOP & HOLDER	100H	630	GLY

END OF SECTION

SECTION 08 80 00 - GLAZING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Glass.

B. Glass film.

C. Glazing compounds and accessories.

1.2 RELATED REQUIREMENTS

A. Section 08 14 16 - Flush Wood Doors: Glazed lites in doors.

B. Section 08 43 13 - Aluminum-Framed Storefronts: Glazing furnished by storefront manufacturer.

1.3 SUBMITTALS

A. Product Data on Glass Types: Submit data on structural, physical and environmental characteristics, size limitations, special handling or installation requirements for each fabricated glass product required. Include installation and maintenance instructions.

B. Product Data on Glazing Compounds: Submit data on chemical, functional, and environmental characteristics, limitations, special application requirements. Identify available colors. Include installation and maintenance instructions.

C. Shop Drawings: Submit final vector art layout for custom graphic film and indicate glass dimensions and relationship to adjoining construction.

D. Certificates: Certify that products meet or exceed specified requirements.

E. Manufacturer's Certificate: Certify that each type of glass and glazing material meets or exceeds specified requirements.

1. Separate certification will not be required for glazing materials bearing manufacturer's permanent labels designating type and thickness of glass, provided labels represent a quality control program involving a recognized certification agency or independent testing laboratory acceptable to authorities having jurisdiction.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with GANA Glazing Manual and GANA Sealant Manual for glazing installation methods. Maintain one copy on site.

B. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience.

C. Safety Glazing Standards: Comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials. Safety glass shall be permanently marked with certification

label of Safety Glazing Certification Council (SGCC) or other certification agency acceptable to authorities having jurisdiction.

D. Single Source Responsibility: Obtain glass and glazing from one source for each product required, including but not limited to the following:

1. Prime glass.

2. Heat treated glass.

3. Glazing accessories.

1.5 PRE-INSTALLATION MEETING

A. Convene one week before starting work of this section.

1.6 DELIVERY, STORAGE AND HANDLING

A. Protect glass and glazing materials during delivery, storage and handling in accordance with manufacturer's directions and as required to prevent edge damage to glass, damage to glass and glazing materials from effects of moisture including condensation, temperature changes, direct exposure to the sun, and from other causes.

1.7 FIELD CONDITIONS

A. Do not install glazing when ambient temperature is less than 50 degrees F. or when joint substrates are wet due to rain, frost, condensation or other causes.

B. Maintain minimum ambient temperature before, during and 24 hours after installation of glazing compounds.

C. Custom Graphic Film:

1. Maintain a constant minimum temperature of 60 degrees F. in the custom graphic film installation areas for at least 10 days before and 10 days after application of materials.

2. Field verify glass dimensions before fabrication.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Float Glass Manufacturers:

1. AGC Flat Glass.

2. Guardian Industries Corp.

3. Pilkington North America Inc.

4. Vitro Architectural Glass (formerly PPG Industries).

2.2 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless noted otherwise.

1. Annealed Type: ASTM C1036, Type I - Transparent Flat, Class 1 - Clear, Quality-Q3.

2. Fully Tempered Types: ASTM C1048, Type 1 clear, Quality Q3 (glazing select).

a. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed, unless otherwise indicated.

2.3 CUSTOM GRAPHIC FILMS

A. Custom Graphic Film: Pressure sensitive graphic film designed for permanent graphics.

1. Graphic Removal: None, permanent.

2. Flammability; Flame spread index and smoke developed index are both 0.

2.4 GLAZING COMPOUNDS

A. General:

1. Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates.

2. Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.

2.5 FABRICATION

A. Fabricate glass and glazing products in sizes required to glaze openings indicated, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standards as required to comply with system performance requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that openings for glazing are correctly sized and within tolerance.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and ready to receive glazing.

3.2 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant.

D. Install sealants in accordance with ASTM C 1193, FGMA Sealant Manual, and the manufacturer's instructions.

E. Protect glass from edge damage during handling and installation.

1. Do not impact glass on metal framing. Use suction cups to shift glass in openings, raising or drifting glass with a pry bar is prohibited. Rotate glass with flares or bevels along one horizontal edge which would occur at setting blocks so edges are located at top of opening.

2. Remove damaged glass from project and dispose of off-site. Damaged glass is glass units with edge damage or other imperfections of kind that, when installed, weakens glass and impairs performance or appearance.

F. Install sealants in accordance with manufacturer's instructions.

G. Acclimate the custom graphic film materials by removing them from packaging in the installation area not less than 24 hours before application.

1. Clean and prepare substrates in accordance with the custom graphic film manufacturer's recommendations.

3.3 INSTALLATION

A. Glazing channel dimensions as indicated are intended to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses. Adjust as required by project conditions at time of installation.

B. Protect glass from edge damage during handling and installation.

C. Install setting blocks of proper size in sill rabbet, located one quarter of glass width from each corner with edge nearest corner not closer than 6 inches from corner. Set blocks in thin course of sealant acceptable for heel bead use.

D. Provide spacers inside and out, of correct size and spacing to preserve required face clearances, for glass sizes larger than 50 united inches (width plus height), except where gaskets or glazing tapes with continuous spacer rods are used for glazing. Provide 1/8 inch minimum bite of spacers on glass and use thickness equal to sealant width. Sealant tape thickness shall be slightly less than final compressed thickness of tape.

E. Provide edge blocking in accordance with glass manufacturer and glazing standards requirements.

F. Set glass units with uniformity of pattern, draw, bow and similar characteristics. Align etching lines vertically and horizontally from pane to pane in an elevation.

G. Provide compressible filler rods or equivalent back-up material as recommended by sealant and glass manufacturers to prevent sealant from extruding into glass channel weep systems, from adhering to joint back surfaces, and to control depth of sealant.

H. Force sealants into glazing channels to eliminate voids and ensure complete "wetting" or sealant bond to glass and channel surfaces.

I. Tool exposed sealant surfaces to provide a "wash" away from glass. Install pressurized tapes and gaskets to protrude slightly out of the channel.

3.4 INSTALLATION - CUSTOM GRAPHIC FILM

A. Install the custom graphic film in accordance with the film manufacturer's written installation instructions and final shop drawings.

1. Install seams plumb and match edges as required. Overlap seams, squeegee, and double cut as recommended by the custom graphic film manufacturer.

2. Squeegee, roll, brush, or use a broad knife to remove air bubbles, wrinkles, blisters, and other defects.

3.5 CLEANING

A. Remove glazing materials from finish surfaces.

B. Remove labels after Work is complete.

C. Clean glass and adjacent surfaces.

3.6 PROTECTION

A. Protect glass from breakage by using crossed streamers attached to framing and held away from glass.

B. Remove broken, chipped, cracked, abraded, or damaged glass and provide new glass units.

C. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

END OF SECTION

SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Metal stud wall framing.

B. Metal channel ceiling framing and suspension systems.

C. Fire rated area separation walls.

D. Acoustic insulation.

E. Gypsum board.

F. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Wood blocking.

B. Section 08 11 13 - Hollow Metal Door Frames.

C. Section 09 90 00 - Painting and Coating.

1.3 SUBMITTALS

A. Shop Drawings: Indicate special details associated with acoustic seals.

B. Product Data: Submit data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Submit manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: For stud framing products that do not comply with ASTM C645 or ASTM C754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

1.4 QUALITY ASSURANCE

A. Gypsum Board System Standards:

1. Application and Finishing: Comply with Gypsum Association GA-216 "Recommended Specifications for Application and Finishing of Gypsum Board".

2. Levels of Finish: Comply with Gypsum Association GA-214 "Recommended Levels of Finish for Gypsum Board, Glass Mat and Fiber-Reinforced Gypsum Panels".

3. Metal Framing Systems: Comply with ASTM C 754.

B. Source Limitations: Provide products manufactured within the United States from materials free of sulfur, formaldehyde, or other deleterious chemicals. Natural gypsum ore shall be

mined in North America. Synthetic (byproduct) gypsum shall be pure calcium sulfate from domestic sources.

C. Fire Resistance Ratings: Where indicated, provide materials and construction which are identical to those of assemblies whose fire resistance rating has been determined per ASTM E 119 by a testing and inspection organization acceptable to authorities having jurisdiction.

1. Provide fire resistance rated assembles identical to those indicated by reference to GA File No's in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in listing of other testing and agencies acceptable to authorities having jurisdiction.

D. Single Source Responsibility: Obtain each type of gypsum board and related joint treatment materials from a single manufacturer.

E. Pre-Installation Conference: Before start of gypsum board installation, meet at the project site with the Architect and installers of related work, including work requiring openings, chases, frames, access panels, support, similar integrated requirements, and mechanical and electrical trades. Review areas of potential interference and conflict and coordinate layout and sequencing requirements for proper installation and integration of the work.

1. Do not proceed with gypsum board installation until blocking, framing, bracing, and other supports for subsequently applied work have been installed, reviewed, and accepted by the Architect.

2. Do not install gypsum board until other work concealed by gypsum board has been installed, tested, and accepted.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original packages, containers or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside, under cover, and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic and other causes. Neatly stack gypsum boards flat to prevent sagging.

C. Handle gypsum boards to prevent damage to edges, ends and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.6 PROJECT CONDITIONS

A. Establish and maintenance environmental conditions for application and finishing of gypsum board in accordance with ASTM C 840 and the gypsum board manufacturer's recommendations.

B. Minimum Room Temperatures: Maintain indicated temperatures for at least 48 hours before application and continuously after, until drying is complete.

1. Non-adhesive attachment to gypsum board to framing: Minimum 40 degrees F.

2. Adhesive attachment and finishing of gypsum board: Minimum 50 degrees F.

C. Ventilate building spaces to remove water not required for drying joint treatment materials. Avoid drafts during hot weather to prevent materials from drying too rapidly.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for fire rated assemblies as indicated on drawings.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturers:

1. Steel Framing and Furring:

a. ClarkDietrich.

b. Telling Industries.

c. Steel Structural Systems.

2. Grid Suspension Systems:

a. Armstrong World Industries.

b. Chicago Metallic Corp.

c. USG Interiors.

d. Worthington Steel Company.

3. Gypsum Board and Related Products:

a. National Gypsum Co..

b. USG Corporation.

c. CertainTeed.

d. Georgia Pacific.

e. Continental (Lafarge).

2.2 METAL FRAMING MATERIALS

A. Non-Loadbearing Framing System Components: ASTM C645; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf.

1. Exception: The minimum metal thickness and section properties requirements of ASTM C645 are waived provided steel of 40 ksi minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E72 using assemblies specified by ASTM C754.

2. Gauge: 20 gauge. Provide double 20 gauge studs at door and borrowed light frames.

3. Studs: C-shaped with knurled or embossed faces.

4. Runners: U shaped, sized to match studs.

5. Ceiling Channels: C-shaped.

6. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch.

7. Resilient Furring Channels: Single or double leg configuration; 1/2 inch channel depth.

B. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.

1. Double runners shall consist of long leg runner and relief runner. Match studs, type recommended by stud manufacturer for floor and ceiling support of studs and for vertical abutment of board work at other work.

2. Contractor's Option: Instead of double runners, provide either Metal-Lite "The System" or Fire Trak Corp. "Deflection Trak" runner assemblies designed to prevent cracking of gypsum board resulting from deflection of the structure above. Fire-rated and non-rated assemblies. Gauge and depth to match studs.

C. Z-Furring: "Z"-shaped furring members with slotted or non-slotted web, fabricated from hot-dip galvanized steel complying with ASTM A 525, G60 coating, with a minimum thickness of 0.0179 inch, face flange of 1-1/4 inch, wall attachment flange of 7/8 inch, depth required to fit insulation thickness indicated.

1. Resilient Furring Members: USG RC-1 special resilient type furring members designed to reduce sound transmission at scheduled sound rated partitions.

2.3 BOARD MATERIALS

A. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.

1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.

2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.

3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.

4. Thickness: 5/8 inch thick unless otherwise indicated.

2.4 GYPSUM WALLBOARD ACCESSORIES

A. Acoustic Insulation: Unfaced blanket/batt insulation produced by combining mineral fibers with formaldehyde free thermosetting resins to comply with ASTM C 665; Type 1, Class A and as follows:

1. Surface Burning Characteristics; Maximum flame spread and smoke developed values of 25 and 50, respectively.

2. Acceptable Products:

   a. Johns Manville "MinWool Sound Attenuation Fire Batts".

   b. Thermafiber "SAFB".

   c. Roxul "AFB".

B. Finishing Accessories: ASTM C1047, Fig. 1, unless noted otherwise.

1. Material: Select from the following:

   a. Sheet steel zinc coated by the hot-dip process.

   b. Paper faced steel.

   c. Paper-faced co-polymer core.

2. Types: As detailed or required for finished appearance.

3. Control Joints: One piece, formed with vee-shaped slot with slot opening covered with removable strip.

4. Edge Trim Shapes: Cornerbead, "LC" Bead or "L" Bead, Bullnose Bead, unless otherwise indicated.

C. Joint Compounds: ASTM C 475, ASTM C 840 and as recommended by gypsum board manufacturer for project conditions.

1. Paper Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.

2. Taping compound formulated for embedding tape and for first coat over fasteners and flanges of corner beads and edge trim.

3. Topping compound formulated for fill (second) and finish (third) coats.

D. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch in Thickness: ASTM C954; steel drill screws, corrosion resistant. Provide size required to fasten framing and furring members securely to substrates indicated. Comply with gypsum board manufacturer's recommendations for applications indicated.

E. Grout: USG "Structo-Lite" or similar lightweight perlite aggregate gypsum plaster. Brace the frame as required to prevent sagging of the header or bowing of the jamb..

F. Asphalt Felt: ASTM D 226, Type 1 (No. 15).

G. Horizontal Banding: 3 inch wide strips of gypsum board.

H. Metal Wire Banding: 18 gauge, non-corrosive wire.

I. Horizontal Stiffener Cross Bracing: 2-1/2 inch, 25 gauge steel channel studs.

J. Metal Strapping: 16 gauge cold-formed flat metal strapping, sizes indicated on the drawing.

PART 3 EXECUTION

3.1 PREPARATION

A. Coordination installation of ceiling suspension system with installation of overhead structural systems to ensure inserts and other structural anchorage provisions have been installed to receive ceiling anchors in a manner that will develop their full strength and are at the spacing required to support ceiling.

3.2 FRAMING INSTALLATION

A. Metal Framing: Comply with ASTM C 754, ASTM C 840 and manufacturer's instructions.

1. Install supplementary framing, blocking and bracing to support gravity and pull-out loads of fixtures, equipment, services, heavy trim, furnishings, and other similar work which cannot be adequately supported by regular framing of gypsum board system. Comply with gypsum board manufacturer's recommendations and United States Gypsum "Gypsum Construction Handbook".

2. Isolate gypsum board system from transfer of structural loading to system, both horizontally and vertically. Provide slip or cushioned type joints to attain lateral support and avoid axial loading.

3. Do not bridge building expansion joints with gypsum board system. Frame both sides of joints with furring and other supports as required.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

1. Secure hangers to structural support by connecting directly to structure where possible. Do not attach hangers to metal deck tabs or metal roof deck. Do not attach hangers to underside of concrete slabs with powder actuated fasteners.

2. Level ceiling and soffit system to a tolerance of 1/1200.

3. Laterally brace entire suspension system.

4. Do not connect or suspend steel framing from ducts, pipes or conduits. Keep hangers and braces 2 inches clear of ducts, pipes, and conduits.

5. Sway brace suspended steel framing with hangers for support.

6. Wire tie or clip furring members to main runners and to other structural supports as indicated.

7. Install bracing as required at exterior locations to resist wind uplift.

8. Attach perimeter wall track or angles where grid suspension system meets vertical surfaces. Mechanically join main beam and cross furring members to each other and butt cut to fit into wall track.

C. Studs: Space studs at 16 inches on center.

1. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud system abuts other construction.

a. Studs Installed Directly Against Exterior Walls: Install asphalt felt strips between studs and wall.

2. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

3. Multiple jamb studs shall be connected together at 12 inches on center.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double 20 gauge studs at jambs. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames. Install runner track section at head and secure to jamb studs.

1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.

2. Screw fasten gypsum board to each stud at the same edge spacing.

3. Where door width exceeds 3 feet, provide 3-1/2 inch x 3/16 inch x 12 inch steel plates on top of stud floor track through bolted into concrete floor at each side of door opening with three bolts per plate.

4. Install horizontal stiffeners at a minimum of 4 feet on center at all stud partitions receiving gypsum board on one side only. Install horizontal stiffeners at 24 inches on center at toilet room double stud chase walls.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches on center.

F. Acoustic Furring: Install resilient channels at maximum 24 inches on center. Locate joints over framing members.

G. Furring for Fire-Resistance Ratings: Install as required for fire-resistance ratings indicated and to GA-600 requirements.

H. Blocking: Install blocking for support of wall cabinets and hardware. Bolt or screw steel channels to studs.

I. Door Frames: Grout open type hollow metal door frames. Apply grout full at head and each jamb. Do not grout tube type closed frames.

3.3 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

1. Provide horizontal banding at stud walls with insulation between studs and gypsum board on one side or neither side. Install banding 6 inches to 12 inches from ends of batts, including cut ends, and 3 feet on center between. Wrap banding around each stud and stretch tight.

B. Acoustic Sealant: Where sound rated gypsum board construction or acoustical insulation is indicated, install acoustical sealant as follows:

1. Place one bead continuously on substrate before installation of perimeter framing members.

2. Place continuous bead at perimeter of each layer of gypsum board and close off sound flanking paths around or through construction, including sealing partitions above acoustical ceilings.

3. In non-fire-rated construction, seal around perimeters, control and expansion joints, penetrations by conduit, pipe, ducts, and rough-in boxes.

3.4 BOARD INSTALLATION

A. Comply with ASTM C 840. Install to minimize butt end joints, especially in highly visible locations. Stagger end joints at least 24 inches and locate as far from center of walls and ceilings as possible.

1. Do not install imperfect, damaged, or damp boards.

2. Butt boards together for a light contact at edges and ends with not more than 1/16 inch open space between boards. Do not force into place.

3. Position boards so like edges abut each other. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions.

4. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments. Provide 1/4 inch to 1/2 inch space and seal. Seal joints with acoustical sealant.

5. Cover both faces of steel stud partition framing with gypsum board in concealed spaces where indicated. Coverage may be accomplished with screws of not less than 8 square feet area except where sound, fire, air, or smoke ratings are required. Fit gypsum board around ducts, pipes, and conduits.

B. Single-Layer Application: Screw apply gypsum board parallel to framing, with ends and edges occurring over firm bearing.

1. Ceilings: Apply gypsum board before wall/partition board application.

2. Walls/Partitions: Apply gypsum board in sheet lengths to minimize end joints.

C. Moisture Resistant Gypsum Board: Install moisture resistant gypsum board in accordance with ASTM C 840 and the gypsum board manufacturer.

D. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board with sealant.

3.5 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces, at locations of stress concentrations, and at locations indicated on the drawings

1. Control joint locations shall be approved by the Architect.

B. Corner Beads: Install at external corners, using longest practical lengths.

3.6 JOINT TREATMENT

A. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

B. Finish gypsum board in scheduled areas in accordance with levels defined in GA-214 and as scheduled below.

1. Level 3:

a. Concealed panels.

b. Fire rated partitions that are not exposed to view.

2. Level 4:

a. Walls and ceilings exposed to view, unless specifically required to be Level 5.

b. Typical for all surfaces to receive wall covering unless noted otherwise.

C. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

1. Feather coats of joint compound so that camber is maximum 1/32 inch.

3.7 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09 51 00 - ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.2 RELATED REQUIREMENTS

A. Division 21 - Fire Suppression: Sprinkler heads in ceiling system.

B. Division 23 - Heating, Ventilating and Air Conditioning: Grilles, registers, and diffusers.

C. Division 26 - Electrical: Light fixtures in ceiling system.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.4 SUBMITTALS

A. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other ceiling finishes, and mechanical and electrical items installed in the ceiling.

B. Product Data: Submit data on suspension system components and acoustical units.

C. Samples: Submit two samples 6 inch x 6 inch in size illustrating material and finish of each type of ceiling panel required.

D. Samples: Submit two samples each, 12 inches long, of each type of suspension system main runner, perimeter molding, and perimeter trim required.

E. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Acoustical Units: Quantity equal to 2 percent of total installed.

2. Extra Suspension System Components: Quantity equal to 2 percent of total installed.

1.5 QUALITY ASSURANCE

A. Fire Performance Characteristics: Products tested in accordance with ASTM E 84 and complying with ASTM E 1264 for Class A Products:

1. Flame Spread: 25 or less.

2. Smoke Developed: 50 or less.

B. Suspension System Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Acoustical Unit Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

D. Installer Qualifications: An experienced Installer who has successfully completed acoustical ceiling systems similar in material, design, and extent as required for the project, with a minimum of five years documented experience.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver acoustical units in original, unopened packages and store them in a fully enclosed space where they are protected from moisture, direct sunlight, and surface contamination.

B. Maintain uniform temperature of minimum 60 degrees F, and maximum humidity of 40 percent prior to, during, and after acoustical unit installation. Place acoustical units in the conditioned space a minimum of 24 hours before installation.

C. Handle ceiling units carefully to prevent chipping of edges or damaging units.

1.7 PROJECT CONDITIONS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat and humidity control s provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Coordinate layout and installation of ceiling systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire suppression system components, and partition systems.

C. Install acoustical units after interior wet work is dry.

PART 2 PRODUCTS

2.1 ACOUSTICAL UNITS

A. Acoustical Units: As indicated in the Finish Schedule.

1. Acoustical units shall comply with ASTM E1264 classifications, unless otherwise indicated.

2.2 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; die cut and interlocking components, with perimeter moldings, hold down clips, stabilizer bars, clips, and splices as required.

1. Bottom flanges shall be continuous with unbroken roll-formed cap, running the length of the member.

2. Suspension system shall be not less in size and strength than required to support itself and shall be increased in size and strength as necessary to support the light fixtures, acoustical units, and related items without deflecting more than 1/360 of the span when tested as a simple beam, ends free.

B. Exposed Steel Suspension System: Formed galvanized steel, commercial quality cold rolled; double web construction; Intermediate-duty.

1. Profile: Tee; 15/16 inch wide face.

2.3 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

1. Size attachment devices for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.

2. Hanger and Tie Wire: ASTM A 641, Class 1 zinc coating, soft temper, sized so stress at 3 times hanger design load (ASTM C 635, Table 1, Direct-Hung) will be less than yield stress of wire. Minimum diameter of 0.106 inch.

B. Hanger Wire: 12 gauge, 0.08 inch galvanized steel wire.

C. Edge Moldings: Same material and finish as grid.

1. At Circular Penetrations of Ceiling: Edge moldings fabricated to diameter required to fit penetration exactly.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.2 PREPARATION

A. Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.

1. Furnish concrete inserts and similar devices to other traades for installation well in advance of time needed for coordination of other work.

B. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half-width units at borders and comply with reflected ceiling plans.

3.3 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with CISCA "Ceiling Systems Handbook", ASTM C 636/C 636M, ASTM E 580/E 580M, and manufacturer's instructions and as supplemented in this section.

1. Powder driven anchors are prohibited for anchorage of any material. Powder driven anchors are anchors driven by compressed air or have explosive caps used when striking the anchor into place.

B. Rigidly secure system, including integral mechanical and electrical components, and increase size and strength of support channels and hangers for maximum deflection of 1:360.

C. Locate system on room axis according to reflected plan.

D. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

E. Splay hangers only where required to miss obstructions. Where ducts or other equipment prevent the regular spacing of hangers, brace, countersplay, or reinforce the nearest affected hangers and related carrying channels to span the extra distance.

1. Where width of ducts and other construction interferes with the location of hangers at spacings required to support suspension system members, install trapezes or similar devices to supplement suspension members and hangers. Size supplemental suspension members and hangers to support ceiling loads within required performance limits.

2. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices that are secure and appropriate for substrate, in a mannger that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.

3. Do not attach hangers to steel roof deck. Attach hangers to structural members.

4. Hanger Spacing: Not more than 4 feet on center along each member supported directly from hangers. Provide hangers not more than 8 inches from ends of each member.

F. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

G. Do not eccentrically load system or induce rotation of runners.

H. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.

1. Screw attach moldings to substrate at intervals not more than 16 inches on center and not more than 3 inches from ends.

3.4 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions with edges concealed by suspension system members.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:

1. Make field cut edges of same profile as factory edges.

2. Field paint cut edges to match panel finish.

F. Where round obstructions occur, provide preformed closures to match perimeter molding.

3.5 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.6 CLEANING

A. Clean exposed ceiling system surfaces, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and provide new ceiling system components that cannot be successfully cleaned and repaired.

END OF SECTION

SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Field application of primers, paints and other coatings.

C. Scope: Finish all surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.

D. See Schedule - Surfaces to be Finished, at end of Section.

1.2 RELATED REQUIREMENTS

A. Section 05 50 00 - Metal Fabrications: Shop-primed items.

B. Section 08 11 13 - Hollow Metal Door: Shop primed door frames.

1.3 SUBMITTALS

A. Product Data: Provide data on all finishing products, including primers.

1. Provide manufacturer's technical information, including label analysis and instructions for handling, storage, and application of each material proposed for use.

2. List each material and cross reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.

B. Samples: Submit two painted samples, illustrating selected colors and textures for each color and system selected . Provide stepped samples, showing each separate coat, including primers. Label each sample with location and paint system identification. Submit on the following substrates.

1. Gypsum Board: Two 12 inch square gypsum board samples of each color and material.

2. Ferrous Metal: Two 4 inch square samples of flat metal and two 8 inch long samples of solid metal for each color and finish.

C. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

D. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.

E. Manufacturer's Instructions: Indicate special surface preparation procedures.

F. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

G. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Paint and Coatings: 1 gallon of each color; store where directed.

2. Label each container with color in addition to the manufacturer's label.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

1.5 MOCK-UP

A. Provide a field sample panel, at least 100 square feet, illustrating each coating color, texture, and finish.

1. Final acceptance of colors will be from job applied samples.

2. The Architect will select one room or surface to represent surfaces and conditions for each type of coating and substrate to be painted. After finishes are accepted, this room or surface area will be used to evaluate coating systems of a similar type.

B. Provide door frame assembly illustrating paint coating color, texture, and finish.

C. Accepted mock-up may remain as part of the work.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers and inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store in tightly covered containers at a minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F, in a well-ventilated area, and as required by manufacturer's instructions.

1. Protect paint materials from freezing.

2. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measurements to ensure workers and work areas are protected from fire and health hazards resulting from paint material handling, mixing, and application.

1.7 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Do not apply coatings during rain, fog, mist, or snow, to damp or wet surfaces, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

D. Minimum Application Temperatures for Latex Paints: Temperature of substrates and surrounding air temperature shall be 50 degrees F; unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles measured mid-height at substrate surface.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Provide all paint and coating products used in any individual system from the same manufacturer; no exceptions.

2.2 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Manufacturer, type, and colors indicated in the Finish Schedule. Provide ready mixed, unless intended to be a field-catalyzed coating.

1. Provide paints and coatings of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.

2. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

3. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.

4. Supply each coating material in quantity required to complete entire project's work from a single production run.

5. Do not reduce, thin, or dilute coatings or add materials to coatings unless such procedure is specifically described in manufacturer's product instructions.

B. Primers: As follows unless other primer is required or recommended by manufacturer of top coats; where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

C. Volatile Organic Compound (VOC) Content:

1. Provide coatings that comply with the most stringent requirements specified in the following:

    a. Architectural coatings VOC limits of Ohio.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

D. Colors: As indicated on drawings.

1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.

2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

3. In utility areas, finish equipment, piping, conduit, and exposed duct work in colors according to the color coding scheme indicated.

2.3 PAINT SYSTEMS - INTERIOR

A. Ferrous Metals, Unprimed, Latex, 3 Coat:

1. One coat alkyd or epoxy metal primer.

2. Two coats semi-gloss acrylic latex enamel, with a total minimum dry film thickness of 2.6.

B. Ferrous Metals, Primed, Latex, 2 Coat:

1. Touch-up with latex primer.

2. Two coats semi-gloss acrylic latex enamel, with a total minimum dry film thickness of 2.6 mils.

C. Galvanized Metals, Latex, 3 Coat:

1. One coat galvanize primer, with a minimum dry film thickness of 1.2 mils.

2. Two coats semi-gloss acrylic latex enamel, with a total minimum dry film thickness of 2.8 mils.

D. Gypsum Board, Latex, 3 Coat:

1. One coat of latex primer sealer, with a minimum dry film thickness of 1.2 mils.

2. Two coats low-luster (eggshell or satin) acrylic latex enamel, with a total minimum dry film thickness of 2.8 mils.

2.4 ACCESSORY MATERIALS

A. Accessory Materials: Materials not specifically indicated but required to achieve the finishes specified; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished before start of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:

3.2 PREPARATION, GENERAL

A. Clean surfaces thoroughly and correct defects prior to coating application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Carefully mix and prepare paint materials in accordance with manufacturer's directions.

1. Maintain containers used in mixing and application of paint in a clean condition, free of foreign materials and residue.

2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.

3. Thinners: Amount and type as recommended by the paint manufacturer.

D. Surface Appurtenances: Remove or mask electrical plates, hardware and accessories, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing. Have items reinstalled by workers skilled in the trades involved.

E. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using specified finish coat material with substrates primed by others.

F. Seal surfaces that might cause bleed through or staining of topcoat.

G. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

H. Gypsum Board Surfaces to be Painted: Remove dust, dirt, loose and other foreign material. Fill hairline cracks, holes and other minor defects with filler compound. Spot prime defects after repair. Sand smooth.

I. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with non-petroleum based solvents. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods. Apply coat of etching primer.

J. Corroded Steel and Iron Surfaces to be Painted: Prepare using at least SSPC-SP 2 (hand tool cleaning) or SSPC-SP 3 (power tool cleaning) followed by SSPC-SP 1 (solvent cleaning).

K. Uncoated Steel and Iron Surfaces to be Painted: Remove oil, grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by power tool wire brushing or sandblasting; clean by washing with solvent. Cleaning methods shall comply with Steel Structures Painting Council recommendations. Prime paint entire surface; spot prime after repairs.

L. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Cleaning methods shall comply with Steel Structures Painting Council recommendations. Prime bare steel surfaces. Re-prime entire shop-primed item.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions. Use applicators and techniques best suited for substrate and type of material being applied. Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not in compliance with specified requirements.

1. Apply a prime coat to materials that are not painted or finished and have not been prime coated by others. Recoat primed and sealed surfaces when suction spots or unsealed areas in the first coat appears to prevent burn through or other defects due to insufficient sealing.

2. Apply additional coats when undercoats, stains, or other conditions show through final coat of paint, until paint film is of uniform finish, color and appearance.

3. Surfaces, including edges, corners, crevices, welds, and exposed fasteners shall receive a dry film thickness matching adjacent flat surfaces.

4. Apply first coat to surfaces that have been cleaned, pretreated or otherwise prepared for painting as soon as practical after preparation and before surface starts to deteriorate.

5. Pigmented (Opaque) Finishes: Completely cover to provide a smooth opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, or other surface imperfections are not acceptable.

B. Where adjacent sealant is to be painted, do not apply finish coats until sealant is applied.

C. Do not apply finishes to surfaces that are not dry or other dirt, rust, scale, grease, moisture, scuffed surfaces, or other conditions detrimental to formation of a durable paint film. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance no thinner than the specified minimum dry film thickness. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

F. Sand surfaces lightly between coats, when recommended by the paint manufacturer, to achieve the required finish.

G. Sand metal surfaces lightly between coats to achieve required finish.

H. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

I. Extend coatings onto areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place.

J. Paint surfaces behind movable equipment and furniture the same as adjacent exposed surfaces. Prime paint only surfaces behind permanently fixed equipment or furniture.

K. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Division 22 and Division 26 for schedule of color coding of equipment, duct work, piping, and conduit.

1. Paint interior surfaces of ducts where visible through registers or grilles with a flat, non-specular black paint.

B. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately. Paint inside faces of panels or covers to match exposed surfaces.

C. Electrical items to be painted include, but is not limited to, conduit and fittings.

D. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.5 SMOKE AND FIRE PARTITION STENCILING SCHEDULE

A. Stenciling: Smoke and Fire partitions shall be stenciled on both sides of the wall with the appropriate label in letters not less than 2-1/2 inches high.

1. Locate stencil 12 inches above ceiling or in a location that can be easily seen when the ceiling panel is removed.

2. Stenciling shall be located above every door and not less than 10 feet on center.

3. Stencil every wall segment (change in direction) but not less than 10 feet on center.

4. Indicate the end of a rated wall with a 2 inch wide vertical line and an arrow pointing from the direction of the rated wall.

5. Labels shall be as follows: Insert the hour rating of the wall in accordance with the ratings indicated on the drawings in the “X” spaces.

   a. Smoke Barrier - 1 Hour

   b. Fire Wall - "X" Hour

   c. Smoke Partition - 0 Hour (sometimes also referred to as smoke tight)

   d. Fire Barrier - "X" Hour

   e. Fire Partition - "X" Hour

B. Paint may be brush or spray applied. Color: Red, semi-gloss.

3.6 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.7 PROTECTION

A. Provide 'wet paint' signs and protect finished coatings until completion of project. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations.

   1. Protect work of other trades from damage during painting operations. Correct damage by cleaning, repairing, replacing, or repainting as directed by the Architect.

B. Touch-up damaged coatings after Substantial Completion.

C. After completion of painting, clean glass and paint spattered surfaces. Remove spattered paint by washing and scraping, using care not to scratch or damage adjacent finished surfaces.

3.8 SCHEDULE - SURFACES TO BE FINISHED

A. Protect finish of existing items not scheduled to receive a new paint finish.

B. Refer to Room Finish Schedule, drawing remarks and notes for general areas requiring painting. paint all rooms on all walls and ceilings unless other finishes are scheduled or "do not paint" is indicated in the Room Finish Schedule.

   1. If an item or surface is not specifically indicated, paint the same as similar adjacent surfaces or materials. If a color or finish is not indicated, the Architect will select from standard colors or finishes.

C. Do Not Paint or Finish the Following Items:

   1. Items fully factory-finished unless specifically noted, including the following:

a. Wood doors.

b. Acoustic materials.

c. Millwork, woodwork, and custom casework.

d. Finished mechanical and electrical equipment.

e. Light fixtures.

f. Switchgear.

g. Distribution cabinets.

2. UL, Factory Mutual or other code required labels, equipment serial number and capacity labels.

3. Operating parts, including moving parts of operating equipment such as valve and damper operators, linkages, sensing devices, motor, and fan shafts.

4. Finished metal surfaces, including stainless steel, anodized aluminum, chromium plate, copper, bronze, and brass.

5. Concealed surfaces, including wall or ceiling surfaces in inaccessible areas such as furred areas, utility tunnels, pipe spaces, duct shafts and above acoustical ceilings and other ceiling spaces.

6. Pipes, valves, ducts, fittings, conduits, fans, and insulation in areas above suspended ceilings.

D. Paint interior items including, but are not limited to:

1. Gypsum board walls and ceilings.

2. Metal door frames.

3. Vision light stops and door closer covers.

4. Prime painted access doors and panels, grilles, registers, diffusers, electric panels, and miscellaneous trim and surfaces to match adjacent surfaces unless otherwise indicated.

E. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.

1. Paint all insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, and hangers, brackets, collars and supports occurring in finished areas to match background surfaces, unless otherwise indicated.

2. Paint shop-primed items occurring in finished areas.

3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.

4. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

END OF SECTION

SECTION 12 21 13 - HORIZONTAL LOUVER BLINDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Horizontal slat louver blinds.

B. Operating hardware.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of headrail brackets.

B. Section 12 24 00 - Window Shades.

1.3 SUBMITTALS

A. Product Data: Provide data indicating physical and dimensional characteristics and operating features.

B. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.

C. Samples: Submit two samples, 12 inch long illustrating slat materials, finish and color, and cord type and color.

D. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. Extra Blind Assemblies: One of each size.

F. Operating and Maintenance Manuals: Submit maintenance data to include in the operating and maintenance manuals.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Surfacing Burning Characteristics: Provide blinds identical to those tested for the following fire performance characteristics as determined by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Test Method: NFPA 701, small scale vertical burn test.

C. Single Source Responsibility: Obtain horizontal louver blinds from one source of a single manufacturer for the entire project.

1.5 PROJECT CONDITIONS

A. Coordinate the work with window installation and placement of concealed blocking to support blinds.

B. Take field measurements to determine sizes required. Show recorded measurements on the shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the Work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Horizontal Louver Blinds:

1. Hunter Douglas Architectural.

2. Levolor Home Fashions Contract Div.

2.2 BLINDS

A. Manual Operation: Control of raising and lowering by cord with full range locking; blade angle adjustable by control wand.

B. Blinds: Hunter Douglas horizontal slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by cord. Inside jamb mounting.

1. Wood Slats: Type selected by the Architect, square slat corners.

a. Width: 1 inch.

2. Slat Support: Woven polypropylene cord, ladder configuration.

3. Head Rail: Pre-finished, manufacturer's standard, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats.

a. Color: Same as slats.

4. Bottom Rail: Pre-finished, manufacturer's standard, with end caps.

5. Lift Cord: Braided nylon; continuous loop with cord lock operation to stop blind at any position in ascending or descending travel.

6. Control Wand: Manufacturer's standard.

a. Length of window opening height less 3 inch.

b. Color: Clear.

7. Headrail Attachment: Wall brackets.

8. Cord Cleats: Manufacturer's standard.

C. Accessory Hardware: Type recommended by blind manufacturer. Provide not less than two fasteners per bracket, fabricated from metal non-corrosive to blind hardware and adjoining construction and to support blind units under conditions of normal use.

2.3 FABRICATION

A. Determine sizes by field measurement.

B. Fabricate blinds to fit within openings with uniform edge clearance of 1/2 inch.

C. Fabricate blinds to cover window frames completely.

D. At openings requiring multiple blind units, provide separate blind assemblies with space of 1/2 inch between blinds, located at window mullion centers.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive the work and critical dimensions are correct. Complete all finishing operations, including painting, before start of installation. Do not proceed with horizontal blind installation until unsatisfactory conditions have been corrected.

B. Verify structural blocking and supports are correctly placed.

3.2 INSTALLATION

A. Install blinds in accordance with manufacturer's instructions.

B. Secure in place with flush countersunk fasteners, minimum two fasteners per bracket.

3.3 TOLERANCES

A. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

B. Maximum Offset From Level: 1/8 inch.

C. Minimum Distance from Face of Glass: 1 inch.

3.4 ADJUSTING

A. Adjust blinds for smooth operation.

3.5 CLEANING

A. Clean blind surfaces in accordance with manufacturer's instructions immediately before occupancy.

B. Remove surplus materials, packaging, rubbish and debris resulting from the installation. Leave areas where installation occurred neat, clean, and ready for use.

END OF SECTION

SECTION 12 24 00 - WINDOW SHADES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Motorized roller shades and accessories.

B. Motor controls, interfaces, and accessories.

1.2 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Concealed wood blocking for attachment of shade brackets and accessories.

B. Division 26 - Electrical.

1.3 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product to be used including materials, finishes, fabrication details, dimensions, profiles, mounting requirements, and accessories.

1. Motorized Shades: Include power requirements and standard wiring diagrams solely for the specified products.

B. Shop Drawings: Include shade schedule indicating size, location and keys to details.

1. Motorized Shades: Include one-line diagrams, wire counts, coverage patterns, and physical dimensions of each item. Include location plan showing all switch and control zones, switches, sensors and other control accessories.

C. Verification Samples: Minimum size 6 inches square, representing actual materials, color and pattern.

D. Manufacturer's Instructions: Include instructions for storage, handling, protection, examination, preparation, and installation of product.

E. Project Record Documents: Record actual locations of control system components and show interconnecting wiring.

F. Operation and Maintenance Data: List of all components with part numbers, and operation and maintenance instructions; include copy of shop drawings.

G. Warranty: Submit sample of manufacturer's warranty and documentation of final executed warranty completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

A. Motorized Shades: Comply with NFPA 70.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than ten years of documented experience.

C. Installer Qualifications: Company specializing in performing work of this type with minimum ten years of documented experience with shading systems of similar size, type, and complexity; manufacturer's authorized representative.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.6 WARRANTY

A. Provide manufacturer's standard, non-depreciating warranty, for interior shading only, covering the following:

1. Shade Hardware: 10 years unless otherwise indicated.

a. ElectroShade with ThermoVeil, EuroVeil, EuroTwill, Soho, Equinox, Midnite, Chelsea, or Classic Blackout shade fabric: 25 years.

2. Shade Fabric: 10 years unless otherwise indicated.

3. Electric Motors, Controls, and Accessories: Five years.

PART 2 PRODUCTS

2.1 ROLLER SHADES

A. General:

1. Provide shade system components that are capable of being removed or adjusted without removing mounted shade brackets or cassette support channel.

2. Provide shade system that operates smoothly when shades are raised or lowered.

3. Electrical Components: Listed, classified, and labeled as suitable for the purpose intended. Individual testing of components will not be acceptable in lieu of system testing. Where applicable, system components to be FCC compliant.

B. Roller Shades: MechoShade Systems LLC; ElectroShade, types as indicated on the drawings.

1. Description: Single roller, motor operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.

a. Fabric: As indicated in the Finish Schedule.

2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.

3. Roller Tubes:

a. Material: Extruded aluminum.

b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.

c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.

4. Hembars: Designed to maintain bottom of shade straight and flat.

a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.

5. Accessories:

a. Fascia: Removable extruded aluminum fascia, size as required to conceal shade mounting, attachable to brackets without exposed fasteners; baked enamel finish.

1) Fascia to be capable of installation across two or more shade bands in one piece.

2.2 MOTOR CONTROLS

A. Unless specifically indicated to be excluded, provide all required equipment, conduit, boxes, wiring, connectors, hardware, supports, accessories, software, system programming, etc. as necessary for a complete operating system that provides the control intent indicated.

B. Provide all components and connections necessary to interface with other systems as indicated.

C. Low-Voltage Wall Controls; IQ Switch:

1. Momentary dry contact switch enables manual local control or network control of any individual shade motor or shade group/sub-group on MechoNet network.

2. Control Functions:

a. Open: Automatically open controlled shade(s) to fully open position when button is pressed.

b. Close: Automatically close controlled shade(s) to fully closed position when button is pressed.

c. Presets: For selection of predetermined shade positions.

3. Finish: White.

4. Products:

a. Double station, 10-button (open, close, and three intermediate stop positions for each of two shades/groups).

2.3 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.

C. Dimensional Tolerances: As recommended in writing by manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Start of installation shall be considered acceptance of substrates.

3.2 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Replace shades that exceed specified dimensional tolerances at no extra cost to Owner.

C. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.4 SYSTEM STARTUP

A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.5 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.6 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

B. Training: Train Owner's personnel on operation and maintenance of system.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.7 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 23 00 00 – HVAC GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes general requirements applicable to all HVAC work.

B. Provide complete and fully operational HVAC systems controlled as indicated.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, spaces above ceilings.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

1.3 SUBMITTALS

A. Action Submittals:

1. Product Data: As indicated in other Division 23 Sections.
2. Shop Drawings: As indicated in other Division 23 Sections.

B. Informational Submittals:

1. Coordination Drawings: Plans, elevations, sections, and details, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:

    a. Building walls, and floors.
    b. Building structural components to which equipment, piping, ductwork, cables, and conduit will be attached.
    c. Suspended ceiling components.
    d. HVAC equipment, piping, ductwork, and controls.
    e. Items penetrating finished ceiling including the following:

        1) Luminaires.
        2) Air outlets and inlets.
        3) Ceiling-mounted devices including speakers, sensors, and WI-FI antennae.
        4) Sprinklers.

C. Closeout Submittals:

1. Operation and Maintenance Data: For HVAC systems and equipment to include in emergency, operation, and maintenance manuals. Provide data in pdf format on CD, DVD, or USB media.

2. Warranty documentation:
3. Record documentation:
4. Testing, adjusting and balancing report.
5. Start reports for all equipment.
6. Field reports, including ductwork leakage testing and piping pressure testing.
7. Subcontractor contact list including name, phone number and email contact information.
8. Maintenance Items: Provide items specified in other Division 23 Sections packaged with protective covering for storage and identified with labels describing contents.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Where feasible, arrange for product delivery when construction has progressed enough to allow the products to be installed in their final locations. If lieu of the above, store products protected from weather and physical damage.

B. Deliver pipes and tubes with factory applied end caps. Maintain end caps through shipping, storage and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture into pipe.

C. Do not allow any materials or equipment to be stored in standing water or exposed to the elements.

D. Handle products carefully to prevent damage. Do not install damaged items; replace them with new items. If approved by the Engineer, items with minor damage may be repaired and installed.

1.5 COORDINATION

A. Arrange for pipe spaces, chases, and openings in building structure during progress of construction, to allow for HVAC installation.

B. Coordinate installation of required supporting devices and set sleeves in cast-in-place concrete and other structural components as they are constructed.

C. Existing Utilities: Do not interrupt utilities serving facilities occupied or partially occupied unless specifically allowed under the following conditions and then only after arranging to provide temporary utility services according to requirements indicated:

1. Notify Owner at least seven days in advance of proposed utility interruptions. Identify extent and duration of utility interruptions and method of interruptions in detail.
2. Do not proceed with proposed utility interruptions without Owner's permission.
3. Utilization of the permanently installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated under what limiting conditions. Provide written agreement to compensate the Owner for utility usage.

D. New Equipment:
1. Utilization of the permanently installed HVAC systems to condition or pressurize the construction area is not allowed without prior specific written authorization from the Owner listing which equipment may be operated under what limiting conditions. Provide written agreement to compensate the Owner for utility usage.

E. Coordinate new installations with existing installations which will remain in place and either be reutilized. Provide transitions and fittings in ductwork and piping as well as extra lengths of

ductwork and piping as required to route around existing installations. Illustrate all such ductwork fittings on the sheet metal shop drawing submittal. Existing installations include plumbing, piping, electrical and other building system components including, but not limited to, sanitary piping, plumbing piping, fire protection piping and heads, heating, condensate drains, cable tray, electrical pull boxes, etc.

F. Provide temporary connections to maintain existing systems in service during construction.

G. Provide the Owner a schedule prior to the start of demolition with a phased selected demolition identified by system and by floor. Identify required outages on the schedule and any temporary measures required to maintain existing systems in service.

H. Coordinate HVAC demolition with all aspects of demolition and temporary construction (including dust barriers) by other trades.

I. The Drawings indicate the general arrangement and scope of the systems and shall be followed insofar as possible. If deviations from the layout are necessitated by field conditions, submit detailed layouts of the proposed departures in writing to the Engineer for approval before proceeding with the work.

J. The Drawings are schematic and are not intended to show every vertical and horizontal offset that may be necessary to complete the system or clear obstructions or the work of the other contractors. Contractors shall anticipate during bidding that additional offsets may be required and include same in their proposals.

K. The Drawings and Specifications are complementary. Items appearing in the Specifications may not be indicated on the Drawings or vice-versa, but all shall be considered as part of the Contract and must be executed by the Contractor the same as though indicated by both. Clarify conflicting statements with the Engineer prior to submitting a bid.

L. Measurements: Make your own measurements on site and be responsible for correct sizes. Coordinate this work with all other branches and trades in such a manner as to cause a minimum of conflict or delay. Coordinate your work in advance with all other trades and report immediately difficulties anticipated; propose solutions to resolve potential difficulties.

M. Clearances: Install items to maintain maximum headroom and clearance around equipment. When space or headroom appear inadequate, notify the Engineer prior to proceeding with the installation. No claims for additional compensation due to failure on the part of the Contractor or his subcontractor to comply with this requirement will be approved.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturer: Subject to compliance with requirements, provide products by one of the listed manufacturers. Where a specific manufacturer is listed on the Drawings, consider it as the Basis-of-Design.

2.2 ELECTRICAL REQUIREMENTS

A. Electrical Characteristics for HVAC Equipment: Equipment with higher electrical power requirements may be furnished provided that such proposed equipment is approved in writing and that connecting electrical supply, wiring, overcurrent protection devices, and conduit sizes

are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine work area and rough-in work before beginning installation.

B. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 PREPARATION

A. Plan Work beforehand.

B. Request explanation from the Engineer if the intent of the Drawings or Specifications is not clear.

3.3 INSTALLATION

A. Install mechanical items in accordance with the Specifications and manufacturer’s installation instructions.

3.4 CLEANING AND RESTORATION

A. Repair damage resulting from the execution of the Work.

B. Leave the work area in broom clean condition or better at the end of each day.

C. Thoroughly clean the work area at the completion of construction.

3.5 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect mechanical equipment components, assemblies, and installations, including connections.

B. Non-Conforming Work: Items will be considered defective if they do not pass tests and inspections.

C. Reports: Prepare test and inspection reports for informational submittals.

3.6 PAINTING

A. Painting of HVAC systems, equipment, and components is specified in Division 09.

B. Damage and Touchup: Repair marred and damaged factory-painted finishes with materials and procedures to match original factory finish.

END OF SECTION 23 00 00

SECTION 23 05 93 – TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Balancing air systems.

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TAB Specialist: An entity engaged to perform TAB Work.

1.3 SUBMITTALS

A. Action Submittals:

1. Certified TAB reports.

B. Informational Submittals:

1. Qualification Data: Within 30 days of Contractor's Notice to Proceed, submit documentation that the TAB contractor and this Project's TAB team members meet the qualifications specified in "Quality Assurance" Article.
2. Contract Documents Examination Report: Within 45 days of Contractor's Notice to Proceed, submit the Contract Documents review report as specified in Part 3.
3. Strategies and Procedures Plan: Within 60 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

1.4 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or NEBB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or NEBB.
2. TAB Technician: Employee of the TAB contractor and certified by AABC or NEBB as a TAB technician.

B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard AABC or NEBB TAB forms.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.5 COORDINATION

A. Notice: Provide at least seven days' notice before each test. Include scheduled test dates and times.

B. Perform TAB after leakage and pressure tests on air and water distribution systems have been satisfactorily completed.

1.6 HVAC CONTRACTOR RESPONSIBILITIES

A. Provide TAB agency one complete set of contract documents, change orders, and approved submittals in digital pdf format.

B. Control contractor shall provide required BAS hardware, software, personnel, and assistance to TAB agency as required for TAB agency to balance the systems. Control contractor shall also provide trending reports as needed to demonstrate that systems are complete.

C. Coordinate meetings and assistance from suppliers and contractors as required by TAB agency.

D. Flag all manual volume dampers with high-visibility tape.

E. Provide access to all dampers, valves, test ports, nameplates, and other appurtenances as required by TAB agency.

F. Remove and replace or repair insulation as needed to provide access for the TAB work.

G. Have the HVAC systems at complete operational readiness before TAB begins.

H. Promptly correct deficiencies identified during TAB.

I. Maintain a construction schedule that allows the TAB agency to complete work prior to occupancy.

PART 2 - PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC systems and equipment controls.

E. Examine ceiling plenums used for supply, return, or relief air to verify that they are properly separated from adjacent areas. Verify that penetrations in plenums are sealed (and fire-stopped if required).

F. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

G. Examine test reports specified in individual system and equipment Sections.

H. Examine terminal units, verifying that they are accessible and that their controls are connected, configured by the control contractor, and functioning.

I. Examine two-way control valves for proper installation and function.

J. Examine three-way valves for proper installation for their intended uses of diverting or mixing fluid flows and for proper function.

K. Examine all equipment items to verify correct piping arrangements.

L. Examine heat-transfer coils for correct piping connections and for clean and properly-spaced fins.

M. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes:

1. Equipment and systems to be tested.
2. Strategies and step-by-step procedures for balancing the systems.
3. Instrumentation to be used.
4. Sample forms with specific identification for each equipment item.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. General:

    a. Electrical power wiring is complete.
    b. Control systems are operational.
    c. Access is provided to balancing and control devices.
    d. Safety devices are operational and indicating normal status.

2. Air Side:

    a. Ductwork is complete with air terminals installed.
    b. Balance dampers are open and operational.
    c. Control dampers are in their normal (fail) positions.
    d. Clean filters are installed.
    e. Building envelope is complete, and exterior windows and doors are closed.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in AABC "National Standards for Total System Balance" or NEBB "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" and in this Section.

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, install test ports and duct access doors that comply with requirements in Division 23 Section "Air Duct Accessories."
2. Install new insulation where insulation is removed for TAB to match removed materials. Restore insulation, coverings, vapor barrier, and finish.

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control devices, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for both fans and outlets. Obtain manufacturer's outlet factors and recommended testing procedures. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of system "as-built" duct layouts with all components identified.

C. For variable-air-volume systems, develop a plan to simulate diversity.

D. Determine the best locations in main and branch ducts for accurate duct-airflow measurements.

E. Locate start-stop and disconnect switches, electrical interlocks, and motor starters.

F. Check condensate drains for proper connections and function.

3.5 PROCEDURES FOR CONSTANT-VOLUME AND VARIABLE-VOLUME AIR SYSTEMS

A. Adjust volume dampers for ducts to indicated airflows within specified tolerances.

1. Measure airflows of branch ducts.
2. Adjust branch duct balance dampers for specified airflows.
3. Re-measure each branch duct after all have been adjusted.

B. Adjust air outlets and inlets for each space to indicated airflows.

1. Adjust each outlet in same room or space to indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.
3. Measure airflows at all inlets and outlets.
4. Adjust each inlet and outlet for specified airflow.
5. Re-measure each inlet and outlet after all have been adjusted.

3.6 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:
1. Air Outlets and Inlets: Plus or minus 10 percent.

3.7 FINAL REPORT

A. General: Prepare a certified written report; tabulate and divide the report into a separate section for each tested and balanced system. Provide a final report that is a complete record of the HVAC system performance, including conditions of operation, any outstanding items, and any deviations found during the testing and balancing process. The final report is to provide a reference of actual operating conditions for the owner and operations personnel. All measurements and test results that appear in the report must be made on site and dated by the responsible technician or test and balance engineer.

B. As a minimum the report shall include the following information:

1. Title page, including:

    a. TAB company name, address, and telephone number.
    b. Project name, client, identification number, and location.
    c. Project architectural firm, address, and telephone number.
    d. Project HVAC engineering firm, address, and telephone number.
    e. Project HVAC contracting firm, address, and telephone number.
    f. TAB certification statement.
    g. Test and balance engineer name, signature, and certification number.
    h. Report date.

2. Table of contents.
3. TAB national performance guarantee.
4. Report summary, including:

    a. List of items that do not meet specified tolerances.
    b. Information that may be considered in resolving deficiencies.

5. Instrument list, including:

    a. Type.
    b. Manufacturer.
    c. Model.
    d. Serial number.
    e. Calibration date.

C. TAB test data for all systems included in the Work.

END OF SECTION 23 05 93

SECTION 23 07 13 – HVAC DUCT INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes duct insulation and appurtenances.

1.2 SUBMITTALS

A. Action Submittals:

1. Product Data: For each type of product indicated. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory- and field-applied if any).

1.3 QUALITY ASSURANCE

A. Surface-Burning Characteristics: For insulation and related materials, as determined by testing identical products according to ASTM E 84, by a testing agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packaging: Insulation material containers shall be marked by manufacturer with appropriate ASTM standard designation, type and grade, and maximum use temperature.

B. Protection: Do not permit mineral fiber insulation to get wet. Mineral fiber insulation that is or has been wet shall be removed from the project site.

1.5 COORDINATION

A. Coordinate sizes and locations of supports, hangers, and insulation shields.

B. Coordinate clearance requirements with duct Installer for duct insulation application. Establish and maintain clearance requirements for installation of insulation and finishes and for space required for maintenance.

1.6 SCHEDULING

A. Schedule insulation application after pressure testing systems and, where required, after installing and testing heat tracing. Insulation application may begin on segments that have satisfactory test results.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Products shall not contain asbestos, lead, mercury, or mercury compounds.

B. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

C. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

D. Flexible Elastomeric Insulation: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type II for sheet materials.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

    a. Aeroflex USA, Inc.
    b. Armacell LLC.
    c. K-Flex USA.

2. Properties:

    a. Maximum Operating Temperature: 180 deg F.
    b. Minimum Operating Temperature: -70 deg F.
    c. Maximum Thermal Conductivity at 75 deg F Mean Temperature: Thickness 1 Inch or Less: 0.245 Btu-in/hr-ft^2-deg F.
    d. Maximum Water Vapor Permeability Thickness 1 Inch or Less: 0.05 perm-inches.
    e. Maximum Water Absorption by Volume: 0.2%.

E. Mineral-Fiber Blanket Insulation: Mineral or glass fibers bonded with a thermosetting resin in a flexible blanket. Comply with ASTM C 553, Type II and ASTM C 1290, Type III with factory-applied FSK jacket. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

    a. CertainTeed Corp.; SoftTouch Duct Wrap.
    b. Johns Manville; Microlite.
    c. Knauf Insulation; Atmosphere Duct Wrap.
    d. Manson Insulation Inc.; Alley Wrap.
    e. Owens Corning; SOFTR Duct Wrap FRK.

2. Properties:

    a. Maximum Operating Temperature: 250 deg F.
    b. Maximum Compressed Thermal Conductivity at 75 deg F Mean Temperature:

        1) Density 0.75 PCF: 0.29 Btu-in/hr-ft^2-deg F.
        2) Density 1.0 PCF: 0.27 Btu-in/hr-ft^2-deg F.
        3) Density 1.5 PCF: 0.24 Btu-in/hr-ft^2-deg F.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated unless otherwise indicated.

B. For indoor applications, adhesives shall have VOC content of 50 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

D. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-PRF-19565C, Type II.

B. Vapor-Barrier Mastic: Water based; suitable for indoor use on below ambient services.

1. Water-Vapor Permeance: ASTM E 96/E 96M, Procedure B, 0.013 perm at 43-mil dry film thickness.
2. Service Temperature Range: Minus 20 to plus 180 deg F.
3. Solids Content: ASTM D 1644, 58 percent by volume and 70 percent by weight.
4. Color: White.

C. Vapor-Barrier Mastic: Solvent based; suitable for indoor use on below ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 0.05 perm at 35-mil dry film thickness.
2. Service Temperature Range: 0 to 180 deg F.
3. Solids Content: ASTM D 1644, 44 percent by volume and 62 percent by weight.
4. Color: White.

D. Breather Mastic: Water based; suitable for indoor and outdoor use on above ambient services.

1. Water-Vapor Permeance: ASTM F 1249, 1.8 perms at 0.0625-inch dry film thickness.
2. Service Temperature Range: Minus 20 to plus 180 deg F.
3. Solids Content: 60 percent by volume and 66 percent by weight.
4. Color: White.

2.4 LAGGING ADHESIVES

A. Description: Comply with MIL-A-3316C, Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

1. Fire-resistant, water-based lagging adhesive and coating for use indoors to adhere fire-resistant lagging cloths over duct insulation.
2. Service Temperature Range: 0 to plus 180 deg F.
3. Color: White.

2.5 SEALANTS

A. ASJ Flashing Sealants:

1. Materials shall be compatible with insulation materials, jackets, and substrates.
2. Fire- and water-resistant, flexible, elastomeric sealant.

3. Service Temperature Range: Minus 40 to plus 250 deg F.
4. Color: White.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of insulation application.

1. Verify that systems to be insulated have been tested and are free of defects.
2. Verify that surfaces to be insulated are clean and dry.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

3.3 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation in accordance with manufacturers' instructions.

B. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of ducts and fittings.

C. Install insulation materials, vapor barriers or retarders, jackets, and thicknesses required for each item of duct system.

D. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation in either wet or dry state.

E. Install insulation with longitudinal seams at top and bottom of horizontal runs.

F. Install multiple layers of insulation with longitudinal and end seams staggered.

G. Keep insulation materials dry during application and finishing. Mineral fiber insulation that is or has been wet shall be removed from the job site.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.

3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Cut insulation in a manner to avoid compressing insulation to less than 75 percent of its nominal thickness.

M. Repair joint separations and cracking due to thermal movement.

N. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

3.4 PENETRATIONS

A. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

3.5 INSTALLATION OF FLEXIBLE ELASTOMERIC INSULATION

A. Seal longitudinal seams and end joints with manufacturer's recommended adhesive to eliminate openings in insulation.

3.6 INSTALLATION OF MINERAL-FIBER INSULATION

A. Blanket or Board Insulation Installation on Ducts and Plenums: Secure with adhesive and insulation pins.

1. Apply adhesives according to manufacturer's recommended coverage rates per unit area, for 50 percent coverage of duct and plenum surfaces.
2. Apply adhesive to all surfaces of ducts, fittings, and transitions.
3. Install either capacitor-discharge-weld pins and speed washers or cupped-head, capacitor-discharge-weld pins on sides and bottom of horizontal ducts and sides of vertical ducts as follows:

    a. On duct sides with dimensions 18 inches and smaller, place pins along longitudinal centerline of duct. Space 3 inches maximum from insulation end joints, and 16 inches on center
    b. On duct sides with dimensions larger than 18 inches, place pins 16 inches on center each way, and 3 inches maximum from insulation joints. Install additional pins to hold insulation tightly against surface at cross bracing.
    c. Pins may be omitted from top surface of horizontal, rectangular ducts and plenums.
    d. Do not over compress insulation during installation.
    e. Impale insulation over pins and attach speed washers.
    f. Cut excess portion of pins extending beyond speed washers or bend parallel with insulation surface. Cover exposed pins and washers with tape matching insulation facing.

4. Overlap unfaced blankets a minimum of 2 inches on longitudinal seams and end joints. At end joints, secure with steel bands spaced a maximum of 18 inches on center.

5. Install insulation on rectangular duct elbows and transitions with a full insulation section for each surface. For board insulation, groove and score insulation to fit to outside and inside radii of elbows. Install insulation on round and flat-oval duct elbows with individually mitered gores cut to fit the elbow.
6. Insulate duct stiffeners, hangers, and flanges that protrude beyond insulation surface with 6-inch-wide strips of same material used to insulate duct. Secure on alternating sides of stiffener, hanger, and flange with pins spaced 6 inches on center.

3.7 INDOOR DUCT INSULATION SCHEDULE

A. Supply air, concealed from view, round or oval, duct insulation:

1. Flexible Elastomeric: 1-1/2 inches thick.
2. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density.

B. Supply air, concealed from view, rectangular, duct insulation:

1. Flexible Elastomeric: 1-1/2 inches thick.
2. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density.

C. Return air or mixed air, concealed from view, round or oval, duct insulation:

1. Flexible Elastomeric: 1-1/2 inches thick.
2. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density.

D. Return air or mixed air, concealed from view, rectangular, duct insulation:

1. Flexible Elastomeric: 1-1/2 inches thick.
2. Mineral-Fiber Blanket: 1-1/2 inches thick and 0.75-lb/cu. ft. nominal density.

E. Relief air or transfer air, any indoor location, duct insulation: None unless lined for acoustics.

1. Flexible Elastomeric: 2 inches thick.
2. Mineral-Fiber Blanket: 2 inches thick and 1.5-lb/cu. ft. nominal density.

END OF SECTION 23 07 13

SECTION 23 31 13 – METAL DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Sheet metal ducts and fittings.
2. Sheet metal materials.
3. Rectangular duct connection systems.
4. Sealants and gaskets.
5. Hangers and supports.

B. Related Requirements

1. ANSI/SMACNA 006-2006 (SMACNA 006) HVAC Duct Construction Standards – Metal and Flexible Third Edition. All ductwork shall be in conformance with this standard.
2. Structural Performance: Duct hangers, supports, and seismic restraints (where applicable) shall withstand the effects of gravity, wind, and seismic loads and stresses within limits and under conditions described in SMACNA 006, ASCE/SEI 7, and local requirements.
3. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

1.2 SYSTEM DESCRIPTION

A. Duct system design, as indicated, has been used to select size and type of air-moving and distribution equipment and other air system components. Changes to layout or configuration of duct system must be specifically approved in writing by the Architect/Engineer. Accompany requests for layout modifications with calculations showing the proposed layout will provide original design results without increasing system total pressure.

1.3 SUBMITTALS

A. Action Submittals:

1. Product Data: For each type of the following products:

   a. Prefabricated ductwork and fittings.
   b. Liners and adhesives.
   c. Rectangular duct connection systems.
   d. Sealants and gaskets.
   e. Seismic-restraint devices.

2. Shop Drawings:

   a. Fabrication, assembly, and installation, including plans, elevations, sections, components, and attachments to other work.
   b. Fittings, including details of construction.
   c. Duct layout indicating sizes, configuration, liner material, and static-pressure classes.

d. Elevations of top and bottom of ducts along with applicable elevations of structural elements.
e. Dimensions of main duct runs from building grid lines.
f. Reinforcement and spacing.
g. Duct material and gauge thickness by pressure class.
h. Seam and joint construction.
i. Penetration details through fire-rated, smoke barriers and other rated partitions.
j. Equipment installation based on equipment being utilized on this project.
k. Duct accessories, including dampers, turning vanes, and duct access doors.
l. Length of application of acoustic duct liner where it will be applied.
m. Hangers and supports, including methods for duct and building attachment, seismic restraints, and vibration isolation.
n. Other systems installed in the same space as ducts where order of installation affects access.
o. Ceiling and wall mounted access doors and panels required to provide access to dampers, controls and other operating devices.
p. Ceiling mounted items, including light fixtures, diffusers, grilles, speakers, smoke detectors, sprinklers, other electrical devices, equipment and building structural members.
q. On each drawing, include a tabular list of each fan system's ductwork represented on that drawing and the total square foot surface area of each fan's duct system illustrated on the drawing.
r. Shop drawings shall be submitted prior to the fabrication or installation of the ductwork and serve as the foundation for coordination between various trades to maintain required ceiling heights.

3. Field Test Reports: Written reports of tests specified in Part 3 of this Section. Include the following:

a. Test procedures used.
b. Test results that comply with requirements.
c. Failed test results and corrective action taken to achieve requirements.

B. Leakage Testing Documentation: Contractor shall submit a written report to the authority having jurisdiction in which ducts designed at static pressures more than 3" wg pressure class have been leak tested and that the air leakage class is less than 6.0 per the Energy Code. Provide duplicate submittal to the Owner and the Engineer.

1.4 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel," for steel hangers and supports.
2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum," for aluminum hangers and supports.
3. AWS D9.1M/D9.1, "Sheet Metal Welding Code," for duct joint and seam welding.

B. NFPA Compliance: Applicable requirements in:

1. NFPA 90A.
2. NFPA 90B.
3. NFPA 96.

C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1.

D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Damage: Handle, transport, and store ducts to avoid damage. Damaged ductwork is not acceptable.

B. Protection: Protect ducts from mechanical damage, weather, and exposure to chemicals (including road salt). Do not permit insulation materials to get wet under any circumstances. Remove insulation that is or has been wet from the project site, and replace the insulation with undamaged new materials.

C. Ductwork and associated components shall be stored on blocking in a clean dry area to prevent damage and to prevent the entrance of dirt, debris, foreign matter and moisture.

D. Ductwork shall be adequately supported during storage to prevent sagging or bending.

E. Provide temporary storage, delivery and handling in accordance with SMACNA Duct Cleanliness for New Construction Guidelines, Intermediate Level.

PART 2 - PRODUCTS

2.1 SINGLE-WALL RECTANGULAR DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA 006 based on indicated static-pressure class. The figure numbers below reference that standard.

1. Transverse Joint: Figure 2-1.
2. Longitudinal Seam: Figure 2-2.
3. Pressure Class Gage and Reinforcement: Table 2-1 through Table 2-52 and Figure 2-3 through Figure 2-18.
4. Elbow: Figure 4-2 (Use the following types only unless specifically approved by the Engineer.):

    a. Type RE 1 (radius elbow).
    b. Type RE 2 (square throat elbow with turning vanes).
    c. Type RE 3 (radius elbow with vanes).
    d. Type RE 5 (dual radius elbow).
    e. Type RE 6 (mitered elbow without turning vanes) only for angles not greater than 45 degrees.

5. Turning Vanes: Figures 4-3 and 4-4. Figure 4-9 short radius vanes in accordance with Chart 4-1 are acceptable.
6. Branch Connection:

    a. Diverging Flow: Figure 4-5 (all types). Figure 4-6 (following types only):

        1) 45-degree entry to rectangular branch.
        2) 45-degree lead-in to round branch.
        3) Conical connection.
        4) Bellmouth connection.
        5) Conical or bellmouth spin-in fitting only for pressure class 2” WG or less.

    b. Converging Flow: Figure 4-5 (all types) and Figure 4-6 (all types). Conical or bellmouth spin-in fitting is acceptable only for pressure class 2” WG or less.

7. Offset, Transition, or Obstruction: Figure 4-7 (all types) and Figure 4-8 (Figure B and C). Do not use Figure 4-8 Figure A (pipe through duct), Figure D (mitered offsets around

obstruction, or Figure E (split duct around obstruction) unless specifically approved by the Engineer.

2.2 SINGLE-WALL ROUND OR FLAT-OVAL DUCTS AND FITTINGS

A. General Fabrication Requirements: Comply with SMACNA 006 Chapter 3, "Round, Oval, and Flexible Duct," based on indicated static-pressure class.

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

    a. Eastern Sheet Metal.
    b. FlaktGroup SEMCO.
    c. Lindab Inc.
    d. McGill AirFlow LLC.
    e. Sheet Metal Connectors, Inc.

2. Transverse Joint: Figure 3-1 (all types).
3. Longitudinal Seam: Figure 3-2 (all types). Do not use type RL-5 (grooved seam pipe lock or flat lock), RL-6 (snaplock), RL-7 (snaplock), or RL-8 (snaplock) seam for duct over 1” WG pressure class. Fabricate round duct larger than 90-inch diameter with butt-welded longitudinal seam.
4. Pressure Class Gage and Reinforcement: Table 3-2 through Table 3-15 and Figure 3-3.
5. Elbow: Figure 3-4. Use centerline radius of 1.5 diameters for each elbow unless space constraints prevent a radius that large; in that event, the radius may be reduced to that indicated in Table 3-1 with mitered segments. If space constraints prevent a radius as large as indicated in Table 3-1, a mitered elbow with turning vanes similar to Figure 4-3 and Figure 4-4 may be used. Do not use an adjustable elbow for duct over 1” WG pressure class.
6. Branch Connection with Diverging or Converging Flow: Figure 3-5 and Figure 3-6. All types are acceptable for pressure class 2” WG or less duct. For pressure class 3” WG or more duct, use 90-degree tee fitting with oval-to-round tap, 45-degree lateral fitting, conical fitting, or wye fitting. Reducers may be incorporated into the fitting. Use only factory-fabricated fittings, not saddles or field-fabricated taps, for pressure class 3” WG or more duct.
7. Offset, Transition, or Obstruction: Figure 4-7 and Figure 4-8 modified for round or flat oval duct. Do not use Figure 4-8 Figure A (pipe through duct), Figure D (mitered offsets around obstruction), or Figure E (split duct around obstruction) unless specifically approved by the Engineer.
8. Flat Oval: Figure 3-7 and applicable figures for equivalent round duct.

2.3 SHEET METAL MATERIALS

A. General Material Requirements: Comply with SMACNA 006 for material thicknesses and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

B. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G90 unless otherwise indicated.
2. Finishes for Surfaces Exposed to View: Mill phosphatized.

C. PVC-Coated, Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

1. Galvanized Coating Designation: G60 or G90.

2. Minimum Thickness for Factory-Applied PVC Coating: 4 mils on sheet metal surface of ducts and fittings exposed to corrosive conditions and minimum 1 mil on opposite surface.
3. Coating Materials: Acceptable to authorities having jurisdiction for use on ducts, listed and labeled for compliance with UL 181, Class 1.

D. Carbon-Steel Sheets: Comply with ASTM A 1008/A 1008M, with oiled, matte finish for exposed ducts.

E. Aluminum Sheets: Comply with ASTM B 209 Alloy 3003, H14 temper; with mill finish for concealed ducts, and standard, one-side bright finish for duct surfaces exposed to view.

F. Reinforcement Shapes and Plates:
1. Steel Duct: ASTM A 36/A 36M, steel plates, shapes, and bars; black or galvanized.
2. Aluminum Duct: ASTM B209 alloy 6061-T6 members or steel members isolated from the aluminum with butyl rubber, neoprene, or EPDM gasket materials.
3. Other Duct Materials: Reinforcement materials compatible with the duct materials at contact points.

G. Tie Rods: Materials compatible with duct materials. Galvanized steel or stainless steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.4 RECTANGULAR DUCT CONNECTION SYSTEMS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

1. Ductmate Industries, Inc.
2. Hart & Cooley, Inc. Ward Industries.
3. McGill Airflow LLC.

B. Connection System: Rectangular duct transverse joint connection, reinforcement, and sealing system with roll-formed metal flanges, metal corner pieces, sealants, gaskets, and cleats.

2.5 SEALANT AND GASKETS

A. General Sealant and Gasket Requirements: Surface-burning characteristics for sealants and gaskets shall be a flame-spread index no greater than 25 and a smoke-developed index no greater than 50 when tested according to UL 723; certified by a nationally recognized testing laboratory.

B. Two-Part Tape Sealing System:

1. Tape: Woven cotton fiber impregnated with mineral gypsum and modified acrylic/silicone activator to react exothermically with tape to form hard, durable, airtight seal.
2. Sealant: Modified styrene acrylic.
3. Water resistant.
4. Mold and mildew resistant.
5. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
6. Service: Indoor or outdoor.
7. Service Temperature: Minus 40 to plus 200 deg F.
8. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum.

9. For indoor applications, sealant with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Water-Based Joint and Seam Sealant:

1. Application Method: Brush on.
2. Solids Content: Minimum 65 percent.
3. Shore A Hardness: Minimum 20.
4. Water resistant.
5. Mold and mildew resistant.
6. VOC: Maximum 75 g/L (less water).
7. Maximum Static-Pressure Class: 10-inch wg, positive and negative.
8. Service: Indoor or outdoor.
9. Substrate: Compatible with galvanized sheet steel (both PVC coated and bare), stainless steel, or aluminum sheets.

D. Flanged Joint Sealant: Comply with ASTM C 920.

1. General: Single-component, acid-curing, silicone, elastomeric.
2. Type: S.
3. Grade: NS.
4. Class: 25.
5. Use: O.
6. For indoor applications, sealant with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

E. Flange Gaskets: Butyl rubber, neoprene, or EPDM polymer with polyisobutylene plasticizer.

F. Round Duct Joint O-Ring Seals:

1. Seal shall provide maximum leakage class of 3 cfm/100 sq. ft. at 1-inch wg and shall be rated for 10-inch wg static-pressure class, positive or negative.
2. EPDM O-ring to seal in concave bead in coupling or fitting spigot.
3. Double-lipped, EPDM O-ring seal, mechanically fastened to factory-fabricated couplings and fitting spigots.

2.6 HANGERS AND SUPPORTS

A. Hanger Rods for Noncorrosive Environments: Cadmium-plated steel rods and nuts or other materials compatible with duct materials.

B. Hanger Rods for Corrosive Environments: Electrogalvanized, all-thread rods; galvanized rods with threads painted with zinc-chromate primer after installation; or stainless steel all-thread rods and nuts.

C. Strap and Rod Sizes: Comply with SMACNA 006 Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct."

D. Cables:

1. Galvanized-Steel Ducts: Galvanized steel complying with ASTM A 603.
2. End Connections: Cadmium-plated steel assemblies with brackets, swivel, and bolts designed for duct hanger service; with an automatic-locking and clamping device.

E. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws; compatible with duct materials.

F. Trapeze and Riser Supports: Structural shapes and plates of materials compatible with duct materials and environmental conditions. Support material shall match duct construction material.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION GENERAL REQUIREMENTS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of duct system. Indicated duct locations, configurations, and arrangements were used to size ducts and calculate friction losses for air-handling equipment sizing and for other design considerations. Install duct systems as indicated unless deviations to layout are approved on Shop Drawings or Coordination Drawings.

B. Install ducts according to SMACNA 006 unless otherwise indicated.

C. Unless otherwise indicated, install ducts vertically plumb or horizontally level, and parallel and perpendicular to building lines. Avoid diagonal runs to maximum extent possible.

D. Install ducts with a minimum clearance of 2 inch plus allowances for insulation thickness and access requirements.

E. Cable hangers may only be used on low pressure (2” wg construction and lower) round spiral ductwork which is not insulated and has a diameter 10” or less. Utilize the double lock method such that the lower loop is clinched tight to the ductwork and the cable is vertical. Utilize manufacturer’s top attachment device.

F. Provide duct offsets needed to avoid interferences with structure, finishes, piping, other ducts, conduit, etc. Coordinate the work with all trades to minimize such offsets. Install ducts with fewest joints possible.

G. Do not penetrate ducts with conduit or piping.

H. Seal all joints and seams. Apply sealant to male end connectors before insertion, and afterward to cover entire joint and sheet metal screws.

I. Secure couplings with sheet metal screws. Install screws at maximum intervals of 12”, with a minimum of 3 screws in each round metallic duct coupling.

J. Install factory- or shop-fabricated fittings for changes in direction, size, and shape and for branch connections. Do not field-cut taps for branch connections in ducts with SMACNA pressure class magnitude more than 2 in wg.

K. Install round or flat-oval ducts in maximum practical lengths to minimize joints.

L. Maintain clearances required in the National Electric Code for electrically-powered items.

M. Where ducts pass through interior partitions or exterior walls and are exposed to view, cover the opening between the partition and duct or duct insulation with sheet metal flanges of same metal type and thickness as the duct. Overlap openings on all sides by at least 1-1/2 inches.

N. Protect duct interiors from moisture, construction debris and dust, and other foreign materials. Comply with SMACNA "IAQ Guidelines for Occupied Buildings Under Construction," Appendix G, "Duct Cleanliness for New Construction Guidelines."

3.2 DUCT SEALING

A. In accordance with ASHRAE 90.1, seal all ducts to SMACNA 006 seal class A with all transverse joints, longitudinal seams, and duct wall penetrations sealed. Seal openings for rotating shafts (including dampers) with bushings or other devices. However, do not seal an opening if sealing the opening would void a manufacturer's listing. Spiral lock seams in round or flat oval ducts do not require sealing unless leakage is detected.

3.3 HANGER AND SUPPORT INSTALLATION

A. Comply with SMACNA 006 Chapter 5, "Hangers and Supports."

B. Building Attachments: Concrete inserts or structural-steel fasteners appropriate for construction materials to which hangers are being attached.

1. Where practical, install concrete inserts before placing concrete.

C. Hanger Spacing: Comply with SMACNA 006 Table 5-1, "Rectangular Duct Hangers Minimum Size," and Table 5-2, "Minimum Hanger Sizes for Round Duct," for maximum hanger spacing; install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.

D. Hangers Exposed to View: Threaded rod and angle or channel supports. Other types of hangers may be used if so indicated or if approved by Engineer.

3.4 CONNECTIONS

A. Make connections to motorized equipment with flexible connectors complying with other Division 23 Sections. Comply with SMACNA 006 for branch, outlet, inlet, and terminal unit connections.

3.5 PAINTING

A. Paint interior of metal ducts that are visible through registers and grilles and that do not have duct liner. Apply one coat of flat, black, latex paint over a primer compatible with the duct material.

3.6 FIELD QUALITY CONTROL

A. Perform tests and inspections.

B. Leakage Tests:

1. Comply with SMACNA "HVAC Air Duct Leakage Test Manual." Submit a test report for each test.
2. Test ductwork sections that have a design static pressure class magnitude of 4-inch wg or more regardless of duct locations. Test representative duct sections totaling no less than 50 percent of total installed duct area. Obtain Engineer's approval of specific sections to be tested beforehand.
3. Disassemble, reassemble, and seal segments of systems to accommodate leakage testing and for compliance with test requirements.
4. Test for leaks before applying external insulation.
5. Conduct tests at static pressures equal to maximum design pressure of system or section being tested. If static-pressure classes are not indicated, test system at maximum

system design pressure. Do not pressurize systems above maximum design operating pressure.

6. Give at least seven days notice for testing.
7. Tests must demonstrate that tested ducts meet SMACNA leakage class 4 or less. If any tested section of ductwork fails to meet this requirement, perform the following at no additional cost to the Owner:
    a. Provide additional sealing of ductwork to eliminate excessive leakage in failed sections. If necessary, replace duct sections.
    b. Continue sealing and retesting until the entire system is proven to meet the leakage requirement. Note that once a section is proven to meet the leakage requirement that section does not need to be tested again unless it is damaged later.

C. Duct System Cleanliness Tests:

1. Visually inspect duct system to ensure that no visible contaminants are present.

D. Duct system will be considered defective if it does not pass tests and inspections.

E. Prepare test and inspection reports.

3.7 DUCT CLEANING

A. Clean duct system(s) before testing, adjusting, and balancing.

3.8 DUCT CONSTRUCTION REQUIREMENTS

A. Fabricate ducts with materials, pressure classes, and insulations indicated on Drawings.

END OF SECTION 23 31 13

SECTION 23 33 00 – AIR DUCT ACCESSORIES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Manual volume dampers.
   2. Duct accessory hardware.

1.2 SUBMITTALS

A. Action Submittals:

   1. Product Data: For each type of product.

   2. For duct silencers, include pressure drop and dynamic insertion loss data. Include breakout noise calculations for high transmission loss casings.

B. Closeout Submittals:

   1. Operation and Maintenance Data: For air duct accessories to include in operation and maintenance manuals.

C. Maintenance Material Submittals:

   1. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   2. Fusible Links: Furnish quantity equal to at least 10 percent of amount installed.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A and NFPA 90B.

B. Comply with SMACNA 006 for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

2.2 MATERIALS

A. Galvanized Sheet Steel: Comply with ASTM A 653/A 653M.

   1. Galvanized Coating Designation: G90.
   2. Exposed-Surface Finish: Mill phosphatized.

B. Stainless-Steel Sheets: Comply with ASTM A 480/A 480M, Type 304 or Type 316 as indicated. Unless indicated otherwise, No. 2 finish for concealed ducts and No. 4 finish for exposed ducts.

C. Aluminum Sheets: Comply with ASTM B 209, Alloy 3003, Temper H14; with mill finish for concealed ducts and standard, 1-side bright finish for exposed ducts.

D. Extruded Aluminum: Comply with ASTM B 221, Alloy 6063, Temper T6.

E. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

F. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 MANUAL VOLUME DAMPERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

1. Ruskin Company.
2. American Warming and Ventilating.
3. McGill Airflow LLC.
4. Nailor Industries Inc.
5. Pottorff.
6. Safe Air – Dowco Products.
7. Vent Products Co., Inc.

B. Round Manual Volume Damper: Diameter 20 inches or less, air velocity 1500 fpm or less, and duct static pressure class 2-inch or less. Galvanized steel sleeve with reinforcing beads. Single galvanized steel blade on axle with molded synthetic bearing at each end of axle and locking quadrant on standoff bracket. Basis of design Ruskin MDRS25.

C. Round or Oval Manual Volume Damper: Diameter 48 inches or less, air velocity 4000 fpm or less, and duct static pressure class 10-inch or less. Galvanized steel construction for galvanized steel duct. Type 304 stainless steel construction for type 304 stainless steel or aluminum duct. Type 316 stainless steel construction for type 316 stainless steel duct. Rolled hat channel frame arranged for slip-in mounting. Single blade (or dual blades with center mullion for oval duct over 36 inches wide). Neoprene blade edge seals. Class II leakage rating. Blade mounted on axle with stainless steel sleeve bearing at each end of axle and locking quadrant on standoff bracket. Basis of design Ruskin CDR25 or CDO25.

D. Rectangular Manual Volume Damper: Height 12 inches or less, air velocity 1500 fpm or less, and duct static pressure class 1-inch or less. Galvanized steel sleeve with blade stop. Single galvanized steel blade on axle with molded synthetic bearings and locking quadrant on standoff bracket. Basis of design Ruskin MD25.

E. Rectangular Manual Volume Dampers: Height 5 inches or more, air velocity 1500 fpm or less., and duct static pressure class 3-inch or less. Galvanized steel hat channel frame with mitered and welded corners and blade stop. Flanged for attaching to wall and flangeless for installing in duct. Multiple single-thickness formed galvanized steel blades with opposed blade linkage enclosed in frame. Blades mounted on axles with molded synthetic bearings. Control shaft extended beyond frame with locking quadrant on standoff bracket. Basis of design Ruskin MD35.

2.4 DUCT ACCESSORY HARDWARE

A. Instrument Test Holes: Cast iron or cast aluminum to suit duct material, including screw cap and gasket. Size to allow insertion of pitot tube and other testing instruments and of length to suit duct-insulation thickness.

B. Adhesives: High strength, quick setting, neoprene based, waterproof, and resistant to gasoline and grease.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install duct accessories in accordance with manufacturers' instructions.

B. Install duct accessories according to applicable details in SMACNA 006 for metal ducts and in NAIMA AH116 for fibrous-glass ducts.

C. Install duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

D. Install volume dampers only in ducts constructed to magnitude 2" pressure class or less. Provide at points on supply, return, and exhaust systems where branches extend from larger ducts.

E. Set each damper fully open position before testing, adjusting, and balancing.

F. Install test holes at fan inlets and outlets and elsewhere as indicated.

G. Install duct test hole where required for testing and balancing purposes.

3.2 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Operate each damper to verify full range of movement.

END OF SECTION 23 33 00

SECTION 23 33 46 – FLEXIBLE DUCTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Insulated flexible ducts.

1.2 SUBMITTALS

A. Action Submittals:

   1. Product Data: For each type of product.
   2. Shop Drawings: For flexible ducts. Include plans showing locations and mounting and attachment details.

PART 2 - PRODUCTS

2.1 ASSEMBLY DESCRIPTION

A. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and with NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."

B. Comply with SMACNA 006 "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods unless otherwise indicated. Sheet metal materials shall be free of pitting, seam marks, roller marks, stains, discolorations, and other imperfections.

C. Comply with Air Diffusion Council "ADC Flexible Air Duct Test Code FD 72-R1."

D. Comply with ASTM E 96/E 96M, "Test Methods for Water Vapor Transmission of Materials."

2.2 INSULATED FLEXIBLE DUCTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

   1. Flexmaster U.S.A., Inc.
   2. McGill Airflow LLC.
   3. Thermaflex; a Flex-Tek Group.
   4. Ward Industries; a brand of Hart & Cooley, Inc.

B. Insulated, Flexible Duct: UL 181, Class 1, two-ply vinyl film supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film.

   1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
   2. Maximum Air Velocity: 4000 fpm.
   3. Temperature Range: Minus 10 to plus 160 deg F.
   4. Insulation R-Value: R6.

C. Insulated, Flexible Duct: UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helically wound, spring-steel wire; fibrous-glass insulation; polyethylene aluminized vapor-barrier film.

1. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
2. Maximum Air Velocity: 4000 fpm.
3. Temperature Range: Minus 20 to plus 210 deg F.
4. Insulation R-Value: R6.

2.3 FLEXIBLE DUCT CONNECTORS

A. Clamps: Stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action in sizes 3 through 18 inches, to suit duct size.

B. Non-Clamp Connectors: Liquid adhesive plus tape.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install flexible ducts according to applicable details in SMACNA006 for metal ducts and in NAIMA AH116 for fibrous-glass ducts.

B. Install in indoor applications only. Flexible ductwork should not be exposed to UV lighting.

C. Connect terminal units to supply ducts directly or with maximum 12-inch lengths of flexible duct. Do not use flexible ducts to change directions or correct misalignments.

D. Connect diffusers or light troffer boots to ducts directly or with maximum 60-inch lengths of flexible duct clamped or strapped in place.

E. Connect flexible ducts to metal ducts with liquid adhesive plus tape or draw bands.

F. Installation:

1. Install ducts fully extended.
2. Do not bend ducts across sharp corners.
3. Centerline radius of bends of flexible ducting shall not be less than one duct diameter.
4. Avoid contact with metal fixtures, water lines, pipes, or conduits.
5. Install flexible ducts in a direct line, without sags, twists, or turns except as noted elsewhere.

G. Supporting Flexible Ducts:

1. Suspend flexible ducts with bands 1-1/2 inches wide or wider and spaced a maximum of 48 inches apart. Maximum centerline sag between supports shall not exceed 1/2 inch per 12 inches.
2. Install extra supports at bends approximately one duct diameter from center line of the bend.
3. Ducts may rest on ceiling joists or truss supports. Spacing between supports shall not exceed the maximum spacing per manufacturer's written installation instructions.
4. Vertically installed ducts shall be stabilized by support straps at a maximum of 72 inches on center.

END OF SECTION 23 33 46

SECTION 23 37 13 – DIFFUSERS, REGISTERS, AND GRILLES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes ceiling- and wall-mounted diffusers, registers, and grilles.

1.2 SUBMITTALS

A. Action Submittal:

1. Product Data: For each product indicated, include the following:

a. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
b. Diffuser, Register, and Grille Schedule: Indicate Drawing designation, room location, quantity, model number, size, and accessories furnished.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following. Where a specific manufacturer is listed in the Drawings, this shall be considered the Basis-of-Design.

1. Titus.
2. Price.
3. Krueger.

2.2 DIFFUSERS, REGISTERS, AND GRILLES

A. Sidewall Return Grille:

1. Material: Steel
2. Finish: Baked enamel, white.
3. Mounting: Surface.
4. Face Arrangement: 35° Fixed.
5. Blades: Fixed, blades parallel to short dimension.
6. Blade Spacing: 3/4-inch.

2.3 SOURCE QUALITY CONTROL

A. Verification of Performance: Rate diffusers, registers, and grilles according to ASHRAE 70, "Method of Testing for Rating the Performance of Air Outlets and Inlets."

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas where diffusers, registers, and grilles are to be installed for compliance with requirements for installation tolerances and other conditions affecting performance of equipment.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install diffusers, registers, and grilles level and plumb.

B. Provide sponge rubber gasket, mounting frame, and concealed fastener mounting on all surface mounted grilles and registers.

END OF SECTION 23 37 13

SECTION 26 00 10 – ELECTRICAL GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes:
1. Descriptions
2. Quality Assurance
3. Record and Information Manuals
4. Examination of Site
5. Warranty
6. Definitions
7. Load Balancing
8. Scheduling
9. Coordination Between Trades
10. Owner Furnished Equipment
11. Materials and Equipment
12. Approved Equals
13. Manufacturer's Declaration
14. Installation
15. Painting and Related Work
16. Cutting, Patching, and Openings
17. Tests
18. Cleaning

B. This Section applies to all sections of Division 26 and 28.

C. All applicable requirements of other portions of the Contract Documents apply to the work of all sections of Division 26 and 28, including, but not limited to, Division 01, General Requirements.

1.2 DESCRIPTIONS

A. The Contractor shall provide the labor, tools, equipment, and materials necessary to complete and leave ready for operation all electrical systems as called for in these specifications or shown on the drawings and all details essential to complete the work. Items omitted from either the specifications or the drawings, but shown or described in the other trades, and all items necessary to make the electrical system complete and workable shall form a part of the work. No "extras" will be allowed.

B. By submitting a bid, the Contractor certifies that:
1. He is satisfied that he understands all site conditions that may have an effect on his bid price.
2. He fully understands the make-up, construction, and operation of all systems and equipment he is bidding on, and he has included in his price all materials, supplies, accessories, and services necessary to make these systems complete and operational.

C. Extent of Work: Work under this contract consists of furnishing, installing, testing, placing into operation, and guaranteeing complete electrical systems as shown on the drawings and as specified in Division 26 and 28. The Contractor shall connect and place all wired equipment in proper working order. Refer to the plans and specifications for work included in this Contract. Some general guidelines to coordinating work between Division 26 and other Divisions are as follows:

1. Division 26 includes all power wiring and raceways for other Divisions' equipment. Division 26 is responsible to furnish and install motor starters and disconnect switches for Division 21, 22 and Division 23 equipment, unless otherwise noted. Remote two wire control logic will be extended to the motor starters as work of other Divisions. Where combined line voltage power/control is used for Division 21, 22 or Division 23 equipment, the wiring and raceways are treated as power wiring and are work of Division 26.
2. Division 26 is responsible for providing appropriate wire and conduit between all distribution equipment and all electrical devices and utilization equipment shown on plans. It is also the responsibility of Division 26 to provide all wire, conduit, and devices necessary to accomplish all control functions as indicated by the control diagrams which are not specifically shown as work of another division.

D. Abbreviations used in these specifications:
1. ADA - Americans with Disabilities Act
2. ANSI - American National Standards Institute
3. ASTM - ASTM International
4. CBM - Certified Ballast Manufacturers
5. EIA - Electronic Industries Association
6. ETL - Electrical Testing Laboratories
7. FCC - Federal Communications Commission
8. ICEA - Insulated Cable Engineers Association
9. IEC - International Electro Technical Commission
10. IES - Illuminating Engineering Society
11. IEEE - Institute of Electrical and Electronics Engineers
12. ITL - Independent Testing Laboratories
13. NEC - National Electrical Code
14. NECA - National Electrical Contractors Association
15. NEMA - National Electrical Manufacturer's Association
16. NESC - National Electrical Safety Code
17. UL - Underwriters Laboratories
18. A/E - Architect of Record or Engineer of Record

1.3 QUALITY ASSURANCE

A. Codes and Standards: Perform all work in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.
1. All work shall be installed in full accordance with the latest edition of the National Electrical Code (NEC) as prepared and published by the National Fire Protection Association (NFPA) and any applicable local or state codes. All electrical equipment shall be listed and labeled by Underwriters' Laboratories, Inc. (UL) or any approved independent nationally recognized electrical testing laboratory where such standards exist. Optionally, in lieu of such listing and labeling, equipment preapproved by the Electrical Inspector may be supplied. Wherever UL compliance is mentioned in the specifications, the above alternatives shall be understood to apply to all listing and labeling requirements. This does not preempt or replace the specifications or replace the approval process. All service switches/circuit breakers shall be listed and labeled as outlined above for service entrance duty.
2. Comply with the requirements of NFPA Code 241 "Building Construction and Demolition Operations," the American National Standards Institute (ANSI) A10 Series standards for "Safety Requirements for Construction and Demolition," and the National Electrical Contractors Association (NECA) National Joint Guideline NJG-6 "Temporary Job Utilities and Services."
3. In addition to the requirements outlined under other sections of the Contract Documents, all Work, material, and equipment shall comply with all requirements of the latest editions and interim amendments of the National Electrical Safety Code, National Fire Protection Association, OSHA, the building Owner's insurance company, and all applicable federal,

state, and local laws and ordinances. All materials shall be listed and labeled by UL and installed as required by the listing.

4. Should any changes in the Drawings or the Project Manual be required to conform to the above regulations, the Contractor shall notify the A/E at the time of submitting his bid. After entering into the Owner-Contractor Agreement, the Contractor shall be held to complete all Work necessary to meet these requirements without additional expense to the Owner.

B. Permits and Regulations

1. The Contractor shall obtain all permits and inspections required by laws, ordinances, rules, regulations, and public authority having jurisdiction. The Contractor shall obtain certificates of such inspections and shall submit same to the A/E. The Contractor shall pay all fees, charges, and expenses in connection therewith. The Contractor shall furnish to the Owner a certificate of final inspection from the proper authority prior to final payment. Obtain and pay for easements required to bring temporary utilities to the site, where the Owner's easement cannot be utilized for that purpose.
2. The Contractor shall not allow or cause any of the Work to be covered up or enclosed until the A/E or Owner has been notified and given reasonable opportunity (2 working days) to review the Work. When required by law or regulations, the governmental agency having jurisdiction for inspections shall be given reasonable notice and opportunity to inspect the Work. Any Work that is enclosed or covered up before such inspection and test shall be uncovered at the Contractor's expense; after it has been inspected, the Contractor shall restore the Work to its original condition at his own expense.

C. Interpretation of Drawings and Project Manual

1. Any discrepancies between Drawings, Project Manual, Drawings and Project Manual, or within Drawings and Project Manual shall be promptly brought to the attention of the A/E for clarification during the bidding period. No allowance shall subsequently be made to the Contractor by reason of his failure to have brought said discrepancies to the attention of the A/E during the bidding period or of any error on the Contractor's part.
2. The locations of switch, receptacle, light, motor, outlets, etc. shown on Drawings are approximate. The Contractor shall use good judgment in placing the preceding to eliminate all interference with ducts, piping, etc. Where any doubt exists, the exact location shall be determined by the A/E.
3. Check all door swings so that light switches are not located behind doors. Relocate switches as required, with A/E's review.
4. All general trades and mechanical Drawings shall be checked by the Contractor before installing any outlets, power wiring, etc.
5. Equipment sizes and locations shown on the Drawings are estimated. Before installing any wire or conduit, the Contractor shall obtain the exact equipment requirements, including wire and conduit entrance locations, and install wire, conduit, disconnect switches, motor starters, overload heaters, circuit breakers, or other items of the correct size and locations for the equipment actually installed. However, wire and conduit sizes shown on the Drawings shall be taken as a minimum and shall not be reduced without written approval from the A/E.
6. The Contractor shall provide all wiring, including disconnect switches and starters for all electrically operated equipment shown on Drawings, specified or required, except that starters and/or disconnect switches need not be furnished where it is specifically noted that they are furnished with the equipment.
7. The Drawings show the general arrangement required for installation of equipment and materials. The Contractor shall follow these Drawings as closely as possible. Should conditions necessitate other arrangements, the Contractor shall prepare and submit drawings showing the changes to the A/E for review before proceeding with the Work.
8. The A/E reserves the right to make minor changes in the location of the installation of equipment and materials up to the time of roughing in at no extra cost to the Owner.
9. The Drawings, do not show all offsets and do not detail every point at which unusual conditions of construction may require special attention. All additional fittings, conduits or

specialties and other appurtenances necessary due to field conditions shall be provided by the Contractor.

10. In all cases where a device or part of the equipment is herein referred to in the singular number, it is intended that such reference shall apply to as many such devices as are required to complete the installations.
11. Wherever in Division 26 and 28 a Manufacturer is specified with the notation "or approved equal" or "A/E approved", the decision as to the material or equipment being "equal" shall be made by the A/E without exception and this decision shall be accepted by the Contractor as final. Where the Contractor proposes to furnish equipment or material in accordance with the "or approved equal" notation said equipment or materials shall be submitted to the A/E, for review.
12. Elevators: The location of switches, receptacles, lights, telephone outlets, etc., in elevator pits and shafts shall be located as required by the elevator Shop Drawings. Elevator controls shall be interlocked with fire alarm system for elevator recall function and fire fighter control.

1.4 RECORD AND INFORMATION MANUALS

A. Record drawings

1. Prepare record documents in accordance with the requirements in Division 1 Section "Project Closeout." In addition to the requirements specified in Division 1, indicate installed conditions for:
   a. Raceway systems, size, contents, and location, for both exterior and interior; locations of all concealed utilities; locations of control devices; distribution and branch electrical circuitry; and fuse and circuit breaker size and arrangements.
   b. Equipment locations (exposed and concealed), dimensioned from prominent building lines.
   c. Approved substitutions, Contract Modifications, and actual equipment and materials installed.
   d. Any deviations made necessary to incorporate equipment different from the Design Base equipment.
   e. At completion of the project, contractor shall deliver record drawings to the A/E.
2. The Record drawings must be kept current and accurate, and may be reviewed at any time by the A/E or Owner.

B. Operations and Maintenance Manuals

1. Prepare maintenance manuals in accordance with Division 1 Section "Project Closeout." Compile and assemble the operation and maintenance data of equipment specified in Division 26 into a separate set of vinyl covered three ring binders, tabulated and indexed for easy reference. Data shall clearly indicate all options and accessories.
2. The following items, together with any other necessary pertinent data, shall be included in each Manual:
   a. Each manual shall be labeled on front cover with project name, Contract, Contractor's name, A/E, and date of project completion.
   b. Manufacturers' names, nearest Factory Representative, and model and serial numbers of components of systems
   c. Operating instructions, start-up and shut-down procedures
   d. Maintenance instructions.
   e. Routine and 24-hour emergency service/repair information:
   f. Name, address and telephone number of servicing agency
   g. Names of personnel to be contacted for service arrangements
   h. Parts list with numbers of replaceable items, including sources of supply
   i. Manufacturers' literature describing each piece of equipment
   j. One approved copy of each submittal
   k. Written warranties
   l. Certificate of Material Receipt and Certificate of System Completion
   m. One typewritten directory for each panelboard as installed
   n. Record (as-built) drawings

o. Certificate of Final Inspection signed by Building Authority having jurisdiction
p. Test Results
q. Coordination analysis (see "Power System Coordination Analysis")
r. Video tapes of all equipment demonstrations and training sessions.

3. In addition to the requirements listed above and specified in Division 1, include the following information for equipment items:
   a. Manufacturers' Descriptive Literature
   b. Final Signed Submittal Copy of Shop Drawings
   c. Spare Parts and Replacement Parts Lists
   d. Manufacturers' Maintenance and Service Manuals
   e. Project-Specific Description of Operation
   f. Wiring Diagrams
   g. Motor list including motor description, motor horsepower, motor voltage, fuse size, fuse type, and overload size.
   h. Fuse list including fuse location, fuse size, fuse type, and load description.
   i. Fixture/Lamp Schedule
4. Materials for more than one item shall clearly indicate which item or items are included on the Project.
5. Shop Drawings which are folded and punched for insertion in the Manual shall be such that the Drawings can be unfolded without removing them from the Manual, and all information shall be legible.

1.5 EXAMINATION OF SITE

A. Certain existing conditions may affect the manner or sequence of the performance of work. Review existing services and structures prior to bidding the work. Review operating schedules for existing systems and services. Coordinate the scheduling of the work with existing operations.

B. The contractor is encouraged to visit the site of the proposed project. After the contract is signed, no allowance will be made for lack of knowledge of the project conditions.

C. Verify and reconcile work required by the contract documents with conditions at the site prior to bid.

1.6 WARRANTY

A. Compile and assemble the warranties specified in Division 26 into a separate set of vinyl covered three ring binders, tabulated and indexed for easy reference.

B. Provide complete warranty information for each item. Information to include:
   1. Product or equipment list.
   2. Date of beginning of warranty or bond.
   3. Duration of warranty or bond.
   4. Names, addresses, and telephone numbers and procedures for filing a claim and obtaining warranty services.

1.7 DEFINITIONS

A. Finished Areas: In general, areas with carpet or tile floors, lay-in or fixed ceiling tile, special architectural ceiling treatment, or tiled, plastered, or paneled walls shall be considered finished areas.

B. Interior: For the purposes of this specification, interior is any area within the boundaries of the foundation of any building within the superstructure or other structures not classified as a building.

C. Concealed: Embedded in or installed behind walls, within partitions, above suspended ceilings, below grade, in trenches, in tunnels and in crawl spaces.

D. Exposed: Not installed underground or "concealed" as defined above

E. Provide: To furnish and install (complete, tested, and ready for operation).

F. Furnish: To purchase and deliver products to the project site and make ready for installation.

G. Install: To take furnished products, assemble, erect, secure, connect, and place into operation.

H. Products: Includes materials, systems and equipment.

I. Work: The providing of products for entire contract.

1.8 LOAD BALANCING

A. It shall be the responsibility of the Contractor to balance the loads on the service system, all distribution systems, and all power equipment so that the variation in amperes per phase readings shall not exceed 5% under normal operating conditions.

B. Special care shall be taken during load balancing to prevent reverse rotation of motors.

C. If, during load balancing, a load is shifted from one phase to another in a color coded system, the Contractor shall paint or tape the ends of the wire at all outlet points with the proper color code for that phase. Failure to do so shall constitute justifiable grounds to require the Contractor to replace the entire circuit with the proper coded wire at no expense to the A/E or Owner.

1.9 SCHEDULING

A. General: It is mandatory that the facility be maintained in operation during construction and that periods of shutdown due to line changeovers, etc. are held to a minimum. These outages must be scheduled with and have the concurrence of the A/E and Owner. Further, it is mandatory that the completion of various stages of the electrical work coincide with the other phases of construction to maintain and permit operation of new installations as construction progresses.

1.10 COORDINATION BETWEEN TRADES

A. General
   1. Coordinate all requirements of the Work of this Division with other Trade Contractors. Such requirements include, but are not limited to, locations, sizes, anchors, and similar items.
   2. Provide all necessary information to other Trade Contractors for such coordination. Such information shall include conforming Shop Drawings, conforming Product Data, and all other required data.
   3. This Contractor shall bear all costs for providing affected Work of related Trade Contractor(s) with no change to the Contract Sum or Date of Substantial Completion.
   4. This Contractor shall coordinate all of his/her work with the General Trades Contractor for location of all devices, fixtures and equipment prior to rough-in.

B. Mechanical/Electrical Coordination
   1. Plumbing, Fire Protection, HVAC, and Electrical Contractors shall coordinate their rough-in, service, and control requirements with each other. Electrical Contractor shall review all control drawings to coordinate exact number and locations of temperature control panels as well as to provide proper starters (including necessary time delays, auxiliary contacts, etc.).
   2. All wiring required to power Plumbing, Fire Protection, or HVAC equipment shall be installed by the Electrical Contractor, including 120 volt to temperature control panels. All control and interlock wiring, regardless of voltage, is by the Contractor furnishing the control panel. The Division 28 Contractor shall be responsible for the wiring from the fire alarm control panel to the control device.
   3. All electrical devices furnished as a part of Division 23 equipment, and installation requirements of all electrical work done by Division 23 Contractors shall conform to the applicable sections of Division 26.
   4. Electrical Contractor shall coordinate with other Contractors prior to installation of switchboards and panelboards to insure requirements of NEC Articles 110 and 408 are met. The Contractor violating this requirement shall be responsible for the cost of all modifications required to comply to the satisfaction of the inspection agency for failure to meet the above code requirements.
   5. If motors and/or equipment are furnished by other Divisions, which require larger starters, safety switches, circuit breakers, fuses, and/or branch circuit conductors than indicated, due to a larger size than specified, the Contractor furnishing the motors shall reimburse the Electrical Contractor for any cost differential.
   6. Final operation of equipment provided under other Divisions shall be the responsibility of the other Divisions Contractor.
   7. Motorized dampers on exhaust fans shall operate when exhaust fan is energized. Wire dampers to their respective motor leads to energize the damper motor and open the damper when the fan runs. Equipment, including dampers, operator, and transformer (if required) will be furnished by the fan supplier. Motors fed from a variable frequency drive (VFD) shall be served from a separate branch circuit. Provide circuit to serve the dampers from the nearest panelboard (normal or emergency, to match motor). Control circuit through VFD damper control relay.

C. Foundations, Bases, Curbs, and Supports
   1. Provide and coordinate all requirements for foundations, bases, curbs, and supports with the related Trade Contractor(s).
   2. Provide required dimensions, templates, and all required information on anchors, sleeves, and cast-in-place accessories, including dimensions, to the related Trade Contractor(s).

D. Openings, Recesses, and Chases
   1. Coordinate all requirements and locations for openings, recesses, and chases with the related Trade Contractor(s).

E. Final Connections
   1. Coordinate with the related Trade Contractor(s) all requirements for rough-in and final connections for equipment installed under this Division.

1.11 OWNER FURNISHED EQUIPMENT

A. The Contractor shall make all necessary provisions for the Owner furnished equipment.

B. The Contractor shall remove, receive, store, uncrate, protect, and install the equipment in place, complete with field connections between shipping splits, feeder connections, and all appurtenances required to place the equipment in operation, ready for use. The Contractor shall be responsible for the equipment when received, as if he had purchased the equipment himself.

PART 2 - PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. New material and equipment; all bearing manufacturer's name, model number, or other identification marking.

B. Provide standard product; latest design with published properties of manufacturer regularly engaged in production of specified material or equipment for minimum 5 years (unless exempted by A/E).

C. Unless otherwise scheduled or indicated, equipment of same type in same room must match as to color, finish, and design.

D. Unless otherwise submitted to and approved by A/E, equipment and its devices must be of same manufacturer; or devices must be approved and warranted by equipment manufacturer.

E. Whenever the Contractor furnishes equipment or material other than the Design Base Manufacturer specified, the Contractor is responsible for the cost and coordination of all modifications required not only for his work, but also for the work of all other Trades affected. Where changes to other Trades' work are required, this Contractor must include the additional costs of all such work in his bid and ultimately make arrangements with these other Trades for such changes and compensate them accordingly. Where changes to design are required, the Contractor shall submit such changes to the A/E for approval. The Contractor shall investigate potential conflicts such as the following:
   1. Provide Physical dimensions and weights
   2. Code required working clearances
   3. Connecting pipe sizes
   4. Additional control and interlock wiring
   5. Lug size and quantity
   6. Increased wire size, fuse size, and motor control equipment size
   7. Increased ventilation requirements
   8. Battery capacity
   9. Sound levels of audible devices
   10. Increased withstand and interrupting ratings of downstream equipment due to differences in over-current protective device characteristics

2.2 APPROVED EQUALS

A. Equal (equivalent) components (articles, devices, materials, forms of construction, fixtures, etc.) by manufacturers not listed but meeting the specifications may be submitted to the A/E for approval and subsequent inclusion into the bidding documents. Submission must be received no later than 10 working days before bid date. If approved, such manufacturers will be listed in an addendum.

B. Submittals must include all of the following:
   1. Cover Letter: Company letterhead; addressed to A/E. Indicate the following
      a. Project name, project number, and phase or bid package if applicable
      b. Specification Section by number and title
      c. Specified Product
      d. Proposed Product
      e. Deviations, if any, from Specified Product
      f. List of attachments
   2. Product Data: Manufacturer's literature, fully describing proposed product with exact item highlighted or clearly indicated.
   3. Specifications: Manufacturer's specifications with all modifications noted as required to show compliance with Bidding Documents.

4. Test Data: Where performance requirements are specified, submit laboratory tests to indicate compliance.
5. Samples: Submit appropriate samples of proposed product when required by A/E, showing color, texture, construction and other attributes necessary for evaluation.

2.3 MANUFACTURER'S DECLARATION

A. Submit a list of the suppliers of Major Equipment to be used on this project. This shall be submitted with the bid. This list shall be typed on company letterhead and shall list the project title. The manufacturer and catalog number/type shall be listed adjacent to each specification section number and product description.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Rough-In
   1. Verify final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected.
   2. Refer to equipment specifications in other Divisions for rough-in requirements.

B. Electrical Installations
   1. General: Sequence, coordinate, and integrate the various elements of electrical systems, materials, and equipment. Comply with the following requirements:
      a. Coordinate electrical systems, equipment, and materials installation with other building components.
      b. Verify all dimensions by field measurements.
      c. Coordinate and provide chases, slots, and openings in other building components during progress of construction, to allow for electrical installations.
      d. Coordinate the installation of required supporting devices and sleeves to be set in poured in place concrete or supported from or on other structural components, as they are constructed.
      e. Sequence, coordinate, and integrate installations of electrical materials and equipment for efficient flow of the work. Give particular attention to large equipment requiring positioning prior to closing in the building and equipment which must be placed in service before further construction can take place.
      f. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
      g. Coordinate connection of electrical systems with exterior underground and overhead utilities and services. Comply with requirements of governing regulations, franchised service companies, and controlling agencies. Provide required connection for each service and place each in proper operating order.
      h. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that the work is shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the A/E before final placement.
      i. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
      j. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
      k. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.2 PAINTING AND RELATED WORK

A. Finish painting in areas of new construction is the responsibility of the General Trades Contractor and is specified in Division 9.

B. Any other painting, required by Sections in Division 26, is the responsibility of the respective Division 26 Contractor. It shall meet the requirements of Division 9. Each Contractor is responsible for repainting of finished areas disturbed by his own cutting and patching.

C. Factory-finished equipment which has rusted or has been damaged shall be cleaned, spot primed with zinc chromate, and finished to the original quality and color by the Contractor.

D. Support steel shall be cleaned, rust removed, primed, and painted.

3.3 CUTTING, PATCHING AND OPENINGS

A. Unless otherwise required in General or Special Conditions, Contractor shall perform all cutting and patching required for his own work. Work must be accomplished in a neat and workmanlike manner, acceptable to the A/E.

B. If necessary to cut into work of other Trades, it shall be done by other Trades at this Contractor's expense. Patching shall be similarly executed.

C. Cutting, burning or drilling of structural support beams, joists, plates, or other structural members is strictly prohibited without the specific written consent of the A/E. Use rotary drills where cutting holes through concrete, brick, plaster, or tile is necessary. Obtain approval of the A/E before proceeding with work.

D. The General Trades Contractor shall locate and size openings for conduit, bus-way or other items prior to construction.

E. All cutting and patching shall be done promptly and all repairs shall be made as necessary to leave the entire work in good condition, including all cutting, fitting, and drilling of masonry, concrete, metal, wood, plaster, and other materials as specified or required for proper assembly, fabrication, installation, and completion of all work of the Contract.

F. Patching shall match adjacent materials and shall be accomplished only by trades men skilled in the respective craft required. Materials and equipment used in the patching work shall comply with requirements of those Sections of the Specification relating to material to be used in new construction.

G. Electrical provides:
   1. All opening and hole information through floors, walls, and roofs for his work; Including all pipe and conduit, inserts, hangers, and plates.
   2. Exact information to other contractors as to size, depth, and location of such openings before construction is in place; and delivery and setting in place of all boxes, sleeves, inserts, and forms for his work in time for installation in all locations.
   3. All cutting, patching and restoration to accommodate Electrical contractor's failure to provide specified date in time for openings to be left or to accommodate boxes, sleeves, inserts, and forms after construction has been Completed by other contractors.
   4. Skilled craftsmen to cut, patch, rebuild, restore, replace, refinish and repaint new construction cut, disturbed, or marred by him to original or new condition; for installation of new, exposed, concealed, underground, or underfloor work of all kinds; for admission of new work and equipment; for installation of new equipment and new work in new construction; for complete restoration of pipe, duct, or equipment covering disturbed or marred by his personnel.

3.4 TESTS

A. The Contract Documents, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction may require portions of the work to be inspected, tested, or approved. These services shall be performed by approved agencies.

B. The A/E must be notified of all scheduled tests and adjustments at least 48 hours before they are scheduled so that he may witness same. If the Contractor performs any test or adjustment without the A/E present, or without proper notification, the Contractor may be required to perform the test or adjustment a second time. All schedules are to be coordinated with the A/E and Owner far enough in advance so-as to minimize inconvenience.

C. Tests shall include:
   1. Proper operation of lights and equipment.
   2. Continuity of conduit system.
   3. Insulation leakage and impedances.
   4. Ground system resistance.
   5. Any sub-system tests described in other Sections of these Specifications.
   6. Record line voltage at service entrance equipment with all systems operating.

D. Provide a signed statement that all tests have been performed and have met all requirements as described in other Sections. This signed statement shall be incorporated into the Record and Information Manual.

E. The Contractor shall bear all costs of such inspections, tests, or approvals.

3.5 CLEANING

A. Upon completion of work, all materials and equipment furnished in this contract shall be thoroughly cleaned of dirt, grease, rust, and oil. Prepare for finish painting, where painting is specified.

END OF SECTION 26 00 10

SECTION 26 00 20 – BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes:
   1. Sleeves
   2. Seals
      a. Watertight Seals
      b. Fire Rated Seals
   3. Firestops
   4. Access Panels
   5. Coordination Drawings

B. This Section applies to all sections of Division 26 and 28.

1.2 SUBMITTAL

A. Action Submittals:
   1. Manufacturer's product data sheets indicating product characteristics, performance and limiting criteria
   2. Manufacturer's installation instruction for each type of seal or firestop required by the project
   3. Written certification that firestopping systems meet firestopping requirements specified herein

1.3 QUALITY ASSURANCE

A. Codes and Standards: Perform all work associated with basic electrical materials in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein. Where provisions of the pertinent codes and standards conflict with this specification, the more stringent provision shall govern.
   1. American Institute of Steel Construction (AISC) "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings."
   2. American Welding Society (AWS) D1.1 "Structural Welding Code - Steel."
   3. National Electrical Code (NEC).

1.4 COORDINATION

A. Prior to all work of this section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly commence.

B. Field verify and coordinate with the General Trades Contractor all locations and dimensions to ensure that the equipment will be properly located, readily accessible, grouped with other trades equipment as needed, and installed in accordance with all pertinent codes and regulations, the contract documents, and the referenced standards.

C. The work shall be carefully laid out in advance, and where cutting, drilling, etc., of floors, walls, ceilings, or other surfaces is necessary for the proper installation, this work shall be carefully

done, and any damage to building, piping, or equipment shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner.

D. In the event any discrepancies are discovered, immediately notify the A/E in writing. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Seals
      a. Link-Seal by Thunderline Corporation
      b. CSD Sealing Systems
      c. O-Z/Gedney Inc.
      d. Crouse Hinds
      e. Appleton
   2. Firestopping Materials
      a. Hilti
      b. Tremco Sealants & Coatings
      c. 3M Fire Protection Products
      d. Dow Corning
      e. CSD Sealing Systems
      f. Insta-Foam Products, Inc.
      g. The Carborundum Co.
   3. Access Panels
      a. Milcor
      b. Zurn
      c. Larsen’s
      d. Acudor
      e. JL
      f. Nystrom
      g. Karp

2.2 SLEEVES

A. Sleeve material through floors and walls shall be machine cut rigid galvanized steel conduit.

B. Sleeves installed in new construction shall have welded flange at mid-point of sleeve which functions as a water barrier and anchor collar.

C. At the contractor’s option, steel wall sleeves by Link-Seal may be provided.

2.3 SEALS

A. Modular mechanical type
   1. Seals shall consist of interlocking synthetic rubber links shaped to continuously fill the annular space between conduit and sleeve.
   2. Seal assembly shall have steel bolts and nuts and rubber sealing element for service and environment under which assembly will be used. Seal shall have a pressure resistance rating of 20 psig.

B. Sealing plug type
   1. Seals shall consist of two identical piece plugs made of synthetic rubber with one edge flanged, serrated profile on the outside and a series of ridges on the inside which compress and assures a tight seal. Seal shall have a pressure resistance of 15 psig at the plug base and 30 psig at the flange. Rubber grade shall be suitable for the service and environment under which sealing plug will be used.

2.4 WATERTIGHT SEALS

A. Modular mechanical type watertight seals shall have zinc galvanized bolts and nuts with EPDM rubber sealing element. Seals shall be Link-Seal, Type C.

B. Sealing plug type watertight seals shall be made of EPDM rubber. Seals shall be by CSD Sealing Systems.

2.5 FIRE RATED SEALS

A. Modular mechanical type fire seal shall have zinc galvanized bolts and nuts with silicone rubber sealing element which provides a three hour fire resistance rating. Seals shall be Link-Seal, Pyro-Pac, model FS.

B. Sealing plug type fire rated seals shall be made of FRR rubber for three hour fire resistance rating, Seals shall be by CSD Sealing Systems.

2.6 FIRESTOPS

A. General
   1. Use only firestop products that have been UL 1479, ASTM E-814 tested for specific fire rated construction conditions conforming to construction assembly type, penetrating item type, annular space requirements, and fire-rating involved for each separate instance.
   2. Cast-in-place firestop devices are installed prior to concrete placement for use with non-combustible and combustible plastic pipe (closed and open piping systems), or electrical cable bundles, penetrating concrete floors.
   3. Sealants, foams or caulking materials for use with non-combustible items including rigid steel conduit and electrical metallic tubing (EMT).
   4. Intumescent sealants, caulking materials for use with combustible items (penetrants consumed by high heat and flame) including PVC jacketed, flexible cable or cable bundles and plastic pipe.
   5. Foams, intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.
   6. Non-curing, re-penetrable intumescent sealants, caulking or putty materials for use with flexible cable or cable bundles.
   7. Wall opening protective materials for use with U.L. listed metallic and specified nonmetallic outlet boxes.
   8. Materials used for complex penetrations shall be made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways.
   9. Non-curing, re-penetrable materials used for large size/complex penetrations made to accommodate cable trays, multiple steel and copper pipes, electrical busways in raceways.
   10. Firestopping materials shall conform to both Flame (F) and Temperature (T) Ratings as tested by nationally accepted test agencies per ASTM E-814 or UL1479 Fire Tests of Through-Penetration Firestops.
       a. The F rating shall be a minimum of one (1) hour, but not less than the fire resistance rating of the assembly being penetrated.
       b. Conduct the fire test with a minimum positive pressure differential of 0.01 inches of water column.

2.7 ACCESS PANELS

A. Furnish ceiling and wall access panels as necessary for access to pull boxes, junction boxes, remote ballasts, electrical equipment, etc., requiring service, adjustment or maintenance.

B. Access panels are to be turned over to the General Trades Contractor for installation.

C. Ceiling Access Panels
   1. Drywall Ceilings: 24” x 24”, Milcor Style DW, 16 gauge steel frame with 14 gauge door panel, double acting concealed spring hinges, cylinder lock, prime painted for finish painting with ceiling.
   2. Fire-Rated Ceiling: 24” x 24”, Milcor fire-rated access door, UL approved, 16 gauge steel frame with 18 gauge recessed door panel, 20 gauge panel sides and 26 gauge panel hat channel, continuous hinge, self-latching cylinder lock, prime painted for finish painting.
   3. Plaster Ceilings: 24” x 24”, Milcor Style AP with finish material same as ceiling material or Style K, 16 gauge galvanized steel frame with 18 gauge galvanized steel door panel. 24" x 24" and larger panels shall be reinforced, continuous hinge, cylinder lock, prime painting for finish painting to match ceiling.
   4. Acoustical Concealed Spline Ceilings: 24” x 24”, Milcor Style AT, 16 gauge steel frame with an 18-gauge steel recessed door panel. 24" x 24" and larger panels shall be reinforced, continuous hinge, cylinder lock, prime painted for finish painting.

D. Wall Access Panels
   1. Drywall: 24” x 24”, Milcor Style DW, 16 gauge steel frame with 14-gauge door panel, double acting concealed spring hinges, cylinder lock, prime painted for finish painting with wall.
   2. Masonry and Tile: 24” x 24”, Milcor Style M Standard, 14 gauge steel frame and door panel, concealed spring hinges, cylinder lock, prime painted for finish painting with wall or Style M stainless.
   3. Fire-Rated: 24” x 24”, Milcor fire-rated access door, UL approved, 1-1/2 hour, Class B rating, 16 gauge steel frame, 20 gauge insulated door panel continuous hinge, automatic door closer, cylinder lock, interior release mechanism, prime painted for finish painting with wall.
   4. Plaster: 24” x 24”, Milcor Style K, 16 gauge steel frame with 14 gauge door panel and 22 gauge galvanized casing beads, concealed spring hinges, cylinder lock, prime painted for finish painting with wall.

2.8 COORDINATION DRAWINGS

A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely shown on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.

   1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

      a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
      b. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
      c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.

d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
e. Show location and size of access doors required for access panels.
f. Indicate required installation sequences.
g. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to Engineer indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling and wall systems, mechanical and electrical equipment, and related Work. Locate components within ceiling plenum to accommodate layout of light fixtures indicated on Drawings. Indicate areas of conflict between light fixtures, duct work, piping, and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:

    a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    c. All penetrations through Fire-rated enclosures.

7. Electrical Work: Show the following:

    a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger. Include proposed elevation of conduits and raceways.
    b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations. Include elevation of fixtures and devices.
    c. Panel board, switch board, switchgear, transformer, busway, generator, and motor control center locations.
    d. Location of pull boxes and junction boxes, dimensioned from column center lines. Include mounting elevations.

8. Fire-Protection System: Show the following:

    a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
    b. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
    c. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
    d. All penetrations through Fire-rated enclosures.

9. Review: Engineer will review coordination drawings to confirm that the Work is being coordinated, but not for the details of the coordination, which are Contractor's

responsibility. If Engineer determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Engineer will so inform Contractor, who shall make changes as directed and resubmit.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Sleeves
1. Furnish and install sleeves for all penetrations through masonry and concrete construction, smoke or fire rated separations, and equipment room walls and floors.
2. Carefully coordinate and check locations of sleeves immediately before and after each concrete pour and masonry installation.
3. Give the General Trades Contractor locations and sizes of all openings required for the installation of sleeves before construction of masonry or concrete walls is started. If it becomes necessary to cut into new work because of the failure of this Contractor to notify the General Trades Contractor, then the General Trades Contractor shall do any necessary cutting and patching required at this Contractor's expense.
4. Cut sleeves through walls flush with each surface. Unused sleeves shall extend beyond wall surface, filled with and surrounded by fire barrier materials, and be provided with caps.
5. Cut sleeves 2 inches above finished floors and 3 inches above floors in equipment rooms and shafts. Bottom of sleeve to be cut flush.
6. Core drill holes for sleeves in existing construction.
7. Patching shall be by the General Trades Contractor at this Contractor's expense.
8. Sleeves must be installed plumb with respect to wall.
9. Pack the space between sleeves and conduits or cables with approved fire barrier sealant to maintain fire rating of structure. Fill space around all sleeves leading into exposed areas with material compatible with adjacent construction and finish or fire barrier sealant material to maintain fire rating of the structure.

B. Seals and Firestops
1. Clean surfaces and substrates of dirt, oil, loose materials and other foreign materials which may affect the proper bond or installation of seals and firestops.
2. Do not apply seals and firestops to surfaces previously painted or treated with a sealer curing compound or similar product. Remove coatings as required in compliance with manufacturer's instructions. Provide primers, as required, which conform to manufacturer's recommendations for various substrates and conditions.
3. Follow manufacturer's written instructions for installation of seals and firestops.
4. Install firestops with sufficient pressure to fill seal holes, voids and openings to ensure an effective smoke seal and to maintain the fire resistance rating of the assembly.
5. Tool or trowel exposed surfaces. Remove excess firestop material promptly as work progresses and upon completion.
6. Unused sleeves shall be filled with and surrounded by firestop material. Sleeve ends shall be capped. Blind sealing plugs may be used at Contractor's option.
7. Install watertight seals for all below grade penetrations of conduit into the building.
8. Install fire rated seals in all fire rated walls and floors.

C. Access Panels
1. Coordinate locations and installation of panels required to permit convenient access to electrical equipment requiring adjustment, service or maintenance. Mark locations of access panels on Record Drawings

3.2 FIELD QUALITY CONTROL

A. Examine seals and firestops to ensure proper installation and full compliance with this specification. Work shall be accessible until inspection and approval by the applicable code authorities.

B. Correct unacceptable seals and firestops and provide additional inspection to verify compliance with this specification at no additional cost to the owner.

END OF SECTION 26 00 20

SECTION 26 05 19 – LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Building wires and cables rated 600 V and less.
2. Connectors, splices, and terminations rated 600 V and less.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers:

1. Alcan Products Corporation; Alcan Cable Division.
2. Alpha Wire.
3. Belden Inc.
4. Encore Wire Corporation.
5. General Cable Technologies Corporation.
6. Okonite
7. Southwire Incorporated.

B. Copper Conductors: Comply with NEMA WC 70/ICEA S-95-658.

C. Conductor Insulation:
1. Type THHN-2-THWN-2

D. Multiconductor Cable:
1. Type MC metal-sheathed cable, with ground wire.

2.2 CONNECTORS AND SPLICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers:

1. AFC Cable Systems, Inc.
2. Gardner Bender.
3. Hubbell Power Systems, Inc.
4. Ideal Industries, Inc.
5. Ilsco; a branch of Bardes Corporation.
6. NSi Industries LLC.
7. O-Z/Gedney; a brand of the EGS Electrical Group.
8. 3M; Electrical Markets Division.
9. Tyco Electronics.

B. Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

2.3 SYSTEM DESCRIPTION

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Wire size shall meet or exceed the overcurrent device ampacity as required by NFPA 70. Where wire size shown on drawings is larger than the apparent ampacity requirements the size shown should prevail to account for voltage drop. The minimum conductor size shall be #12 AWG except for control wiring, which may be #14 AWG.

B. Conductors: Copper, solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Feeders may utilize the following:
   1. Type THHN-2-THWN-2, single conductors in raceway

B. Feeders Concealed in Ceilings, Walls, Partitions, and Crawlspaces:
   1. Type THHN-2-THWN-2, single conductors in raceway

C. Feeders Concealed in Concrete, below Slabs-on-Grade, and Underground:
   1. Type THHN-2-THWN-2, single conductors in raceway

D. Exposed Branch Circuits, Including in Crawlspaces:
   1. Type THHN-2-THWN-2, single conductors in raceway

E. Branch Circuits Concealed in Ceilings, Walls, and Partitions:
   1. Type THHN-2-THWN-2, single conductors in raceway
   2. Metal-clad cable, Type MC

F. Branch Circuits Concealed in Concrete, below Slabs-on-Grade, and Underground:
   1. Type THHN-2-THWN-2, single conductors in raceway

G. Cord Drops and Portable Appliance Connections: Type SO, hard service cord with stainless-steel, wire-mesh, strain relief device at terminations to suit application.

3.3 INSTALLATION OF CONDUCTORS AND CABLES

A. MC Cable may be used for branch circuiting to wiring devices provided it is supported properly and run taut. MC must transition to other approved wire types prior to leaving the room it is permitted in. MC may not be used for home-runs.

B. MC Cable may be used for lighting fixture whips, no longer than 6’-0” and shall be properly supported.

C. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

D. All feeder and branch circuits shall be ran with dedicated neutral conductors (shared neutrals not permitted).

E. Complete raceway installation between conductor and cable termination points according to Section 260533 "Raceways and Boxes for Electrical Systems" prior to pulling conductors and cables.

F. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

G. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

H. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

I. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 FIELD QUALITY CONTROL

A. Contractor shall perform insulation resistance (IR) tests, commonly called “megger” tests on any feeder or circuit which may have been damaged during installation or where identified as questionable by the Architect or Engineer. Test shall be performed according to standards published by ANSI/NETA.

B. Testing Agency: Engage a qualified testing agency to perform tests and inspections.

C. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

D. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Perform each visual and mechanical inspection and electrical test stated in NETA Acceptance Testing Specification. Certify compliance with test parameters.

2. Infrared Scanning: After Substantial Completion, but not more than 60 days after Final Acceptance, perform an infrared scan of each splice in conductors No. 3 AWG and

larger. Remove box and equipment covers so splices are accessible to portable scanner. Correct deficiencies determined during the scan.

a. Follow-up Infrared Scanning: Perform an additional follow-up infrared scan of each splice 11 months after date of Substantial Completion.
b. Instrument: Use an infrared scanning device designed to measure temperature or to detect significant deviations from normal values. Provide calibration record for device.
c. Record of Infrared Scanning: Prepare a certified report that identifies splices checked and that describes scanning results. Include notation of deficiencies detected, remedial action taken, and observations after remedial action.

E. Test and Inspection Reports: Prepare a written report to record the following:

1. Procedures used.
2. Results that comply with requirements.
3. Results that do not comply with requirements and corrective action taken to achieve compliance with requirements.

F. Cables will be considered defective if they do not pass tests and inspections.

END OF SECTION 26 05 19

SECTION 26 05 29 – HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Hangers and supports for electrical equipment and systems.
2. Construction requirements for concrete bases.

1.2 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. IMC: Intermediate metal conduit.

C. RGC: Rigid Galvanized Conduit.

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple raceways capable of supporting combined weight of supported systems and its contents.

1.4 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases.

B. Coordinate installation of roof curbs, equipment supports, and roof penetrations.

PART 2 - PRODUCTS

2.1 SUPPORT, ANCHORAGE, AND ATTACHMENT COMPONENTS

A. Steel Slotted Support Systems: Comply with MFMA-4, factory-fabricated components for field assembly.

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Allied Tube & Conduit.
b. Eaton's B-Line Series – Cooper Industries.
c. ERICO International Corporation.
d. GS Metals Corp.
e. Thomas & Betts Corporation.
f. Unistrut; Atkore International.
g. Wesanco, Inc.

2. Supports shall be hot-dip galvanized after fabrication and applied according to MFMA-4.

3. Where installed outdoors or subject to corrosion stainless steel supports shall be provided.

B. Raceway and Cable Supports: As described in NECA 1 and NECA 101.

C. Conduit and Cable Support Devices: Steel hangers, clamps, and associated fittings, designed for types and sizes of raceway or cable to be supported.

D. Support for Conductors in Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug or plugs for non-armored electrical conductors or cables in riser conduits. Plugs shall have number, size, and shape of conductor gripping pieces as required to suit individual conductors or cables supported. Body shall be malleable iron.

E. Mounting, Anchoring, and Attachment Components: Items for fastening electrical items or their supports to building surfaces include the following:
1. Powder-Actuated Fasteners: Threaded-steel stud, for use in hardened portland cement concrete, steel, or wood, with tension, shear, and pullout capacities appropriate for supported loads and building materials where used.
2. Mechanical-Expansion Anchors: Insert-wedge-type, zinc-coated or stainless steel, for use in hardened portland cement concrete with tension, shear, and pullout capacities appropriate for supported loads and building materials in which used.
3. Concrete Inserts: Steel or malleable-iron, slotted support system units similar to MSS Type 18; complying with MFMA-4 or MSS SP-58.
4. Clamps for Attachment to Steel Structural Elements: MSS SP-58, type suitable for attached structural element.
5. Through Bolts: Structural type, hex head, and high strength. Comply with ASTM A 325.
6. Toggle Bolts: All-steel springhead type.
7. Hanger Rods: Threaded steel.

PART 3 - EXECUTION

3.1 APPLICATION

A. Comply with NECA 1 and NECA 101 for application of hangers and supports for electrical equipment and systems except if requirements in this Section are stricter.

B. Multiple Raceways or Cables: Install trapeze-type supports fabricated with steel slotted support system.

1. Secure raceways and cables to these supports with single-bolt conduit clamps using spring friction action for retention in support channel.

C. Spring-steel clamps designed for supporting single conduits without bolts may be used for 1-1/2-inch and smaller raceways serving branch circuits and communication systems above suspended ceilings and for fastening raceways to trapeze supports.

3.2 SUPPORT INSTALLATION

A. Raceway Support Methods: In addition to methods described in NECA 1, metallic raceways may be supported by openings through structure members, as permitted in NFPA 70.

B. Mounting and Anchorage of Surface-Mounted Equipment and Components: Anchor and fasten electrical items and their supports to building structural elements by the following methods unless otherwise indicated by code:

1. To Wood: Fasten with lag screws or through bolts.
2. To New Concrete: Bolt to concrete inserts.
3. To Masonry: Approved toggle-type bolts on hollow masonry units and expansion anchor fasteners on solid masonry units.
4. To Existing Concrete: Expansion anchor fasteners.
5. Instead of expansion anchors, powder-actuated driven threaded studs provided with lock washers and nuts may be used in existing standard-weight concrete 4 inches thick or greater. Do not use for anchorage to lightweight-aggregate concrete or for slabs less than 4 inches thick. Powder-actuated fasteners may not be used in occupied buildings.
6. To Steel: Welded threaded studs with lock washers and nuts, Beam clamps, or Spring-tension clamps.
7. To Light Steel: Sheet metal screws.
8. Items Mounted on Hollow Walls and Nonstructural Building Surfaces: Mount cabinets, panelboards, disconnect switches, control enclosures, pull and junction boxes, transformers, and other devices on slotted-channel racks attached to substrate.

3.3 PAINTING

A. Touchup: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.

1. Apply paint by brush or spray to provide minimum dry film thickness of 2.0 mils.

2. See additional requirements where painting specification are included as part of this project.

3. Where finish painting is not included in the general trades contract, or when the Electrical Contractor is the sole contractor, provide prime coat and two finish coats of paint to all ferrous metal which is not galvanized.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A780 / A780M.

END OF SECTION 26 05 29

SECTION 26 05 33 – RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Metal conduits, tubing, and fittings.
2. Nonmetal conduits, tubing, and fittings.
3. Boxes, enclosures, and cabinets.
4. Floor boxes and poke-thru devices.

1.2 DEFINITIONS

A. FMC: Flexible Metal conduit.

B. RGC: Rigid galvanized threaded steel conduit.

C. HDPE: High Density Polyethelene.

D. IMC: Intermediate metal conduit.

E. LFMC: Liquid-Tight Flexible metal conduit.

F. RNC: Rigid Nonmetallic Conduit.

1.3 ACTION SUBMITTALS

A. Product data: For each type of device and component indicated. Include manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

PART 2 - PRODUCTS

2.1 CONDUITS, TUBING, AND FITTINGS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.

1. AFC Cable Systems, Inc.
2. Allied Tube & Conduit.
3. Anamet Electrical, Inc.
4. Carlon
5. Cantex
6. Champion
7. Electri-Flex Company.
8. O-Z/Gedney.
9. Picoma Industries.
10. Republic Conduit.
11. Robroy Industries.
12. Southwire Company.

13. Thomas & Betts Corporation.
14. Western Tube and Conduit Corporation.
15. Wheatland Tube Company.

B. Listing and Labeling: Conduits, tubing, and fittings shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.2 CONDUIT TYPES - APPLICATIONS AND RESTRICTIONS:

A. RGC: Comply with ANSI C80.1 and UL 6.
1. Not to be used in corrosive atmospheres.

B. IMC: Comply with ANSI C80.6 and UL 1242.
1. Not to be used in corrosive atmospheres.

C. RNC: Type PVC Schedule 40, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
1. For use underground, direct buried or encased in concrete.

D. EMT: Comply with ANSI C80.3 and UL 797.
1. Not to be used underground or where exposed to weather.
2. Not to be used in utility tunnels or corrosive atmospheres.

E. FMC: Comply with UL 1; zinc-coated steel or aluminum.
1. For use with fixture whips and lighting fixtures (6’ max).
2. For connections to dynamic equipment and connections to motors in airstream.
3. For use in existing walls.

F. LFMC: Flexible steel conduit with PVC jacket and complying with UL 360.
1. For use under raised floors.
2. For connections to motors except where protection from physical damage is needed (in air stream).
3. For use in wet locations.

2.3 CONDUIT FITTINGS:

A. Manufacturers: Subject to compliance with requirements, provide products equal to one of the following.
1. Appleton
2. Cooper Industries
3. Efcor
4. Steel City
5. T&B
6. By Raceway Manufacturer
7. or equal.

B. Metallic fittings shall comply with NEMA FB 1 and UL 514b.

C. All fittings shall be UL listed for the application.

D. RGC and IMC
1. Threaded fittings, malleable iron, with grounding bushing. Cooper Industries #800 series, or equal.

E. RNC (PVC)

1. Fittings shall be of the same material and manufacturer as the raceway, solvent welded type.

2. Solvent cements and adhesive primers shall have a VOC content of 510 and 550 g/L or less, respectively, when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

F. EMT:
1. Steel fittings, setscrew type, insulated throats, concrete tight. Cooper Industries #450 series, or equal.

G. FMC:
1. Non-insulated, malleable iron, clamp type. Cooper industries #700 series or equal

H. LFMC:
1. Steel or malleable iron. Cooper Industries Liquidator series, LTK series, or equal.

I. Expansion Fittings: PVC or steel to match conduit type, complying with UL 651, rated for environmental conditions where installed, and include flexible external bonding jumper.

J. Joint Compound for RGC, IMC: Approved, as defined in NFPA 70, by authorities having jurisdiction for use in conduit assemblies, and compounded for use to lubricate and protect threaded conduit joints from corrosion and to enhance their conductivity.

K. Solvent cements and adhesive primers shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."

2.4 CONDUIT SIZES

A. Minimum Raceway Size: 3/4-inch trade size (lighting and power circuits); 1-inch trade size (telecommunications and low voltage systems).

B. Finish: Manufacturer's standard enamel finish.

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.

1. Adalet.
2. Eaton
3. EGS/Appleton Electric.
4. Erickson Electrical Equipment Company.
5. FSR Inc.
6. Hoffman.
7. Hubbell Incorporated.
8. Kraloy.
9. Milbank Manufacturing Co.
10. Mono-Systems, Inc.
11. O-Z/Gedney.
12. RACO; Hubbell.
13. Robroy Industries.
14. Spring City Electrical Manufacturing Company.
15. Stahlin Non-Metallic Enclosures.
16. Thomas & Betts Corporation.
17. Wiremold / Legrand.

B. General Requirements for Boxes, Enclosures, and Cabinets: Boxes, enclosures, and cabinets installed in wet locations shall be listed for use in wet locations.

C. Sheet Metal Outlet and Device Boxes: Comply with NEMA OS 1 and UL 514A. Boxes shall be galvanized or plated finish.

D. Cast-Metal Outlet and Device Boxes: For use in surface mounted applications. Comply with NEMA FB 1, Type FD, with gasketed cover.

E. Luminaire Outlet Boxes: Nonadjustable, designed for attachment of luminaire weighing 50 lb. Outlet boxes designed for attachment of luminaires weighing more than 50 lb shall be listed and marked for the maximum allowable weight.

F. Paddle Fan Outlet Boxes: Nonadjustable, designed for attachment of paddle fan weighing 70 lb.

1. Listing and Labeling: Paddle fan outlet boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

G. Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

H. Box extensions used to accommodate new building finishes shall be of same material as recessed box.

I. Device Box Dimensions: 4 inches square or octagonal by 2-1/8 inches deep. Provide extension rings as required for recessed boxes.

J. Gangable boxes are prohibited.

K. Hinged-Cover Enclosures: Comply with UL 50 and NEMA 250, Type 1 for indoor application, Type 3R for outdoor applications (unless otherwise noted on drawings), with continuous-hinge cover with flush latch unless otherwise indicated.

1. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.
2. Interior Panels: Steel; all sides finished with manufacturer's standard enamel.

L. Cabinets:

1. NEMA 250, Type 1 for indoor application, Type 3R for outdoor applications (unless otherwise noted on drawings), galvanized-steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel.
2. Hinged door in front cover with flush latch and concealed hinge.
3. Key latch to match panelboards.
4. Metal barriers to separate wiring of different systems and voltage.
5. Accessory feet where required for freestanding equipment.
6. Nonmetallic cabinets shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.6 FLOOR BOXES AND POKE-THRU DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following.

1. FSR Inc.
2. Hubbell Incorporated.
3. Wiremold / Legrand.

B. Metal Floor Boxes:

1. Material: Cast iron, where installed in concrete slab, otherwise sheet metal is acceptable.
2. Type: Fully adjustable, multi-service (power and telecom), minimum 6-gang.
3. Devices shall be concealed beneath cover (recessed type box).
    a. Minimum two (2) duplex receptacles.
    b. Minimum two (2) data outlets.
    c. Minimum space for two (2) single-gang spaces for future Telecom or A/V devices.
4. Shape: Rectangular.
5. Listing and Labeling: Metal floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
6. Cover: Provide metal cover with finished floor insert (selection by Architect).
7. Floor boxes shall be compatible with standard wiring device types and low voltage modular jacks.
8. Listing and Labeling: Nonmetallic floor boxes shall be listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

C. Poke-Thru Devices:

1. Material: Sheet metal formed device box.
2. Types:
    a. Type A: 6” diameter, multi-service (power and telecom), multi-gang. Devices shall be concealed beneath cover (recessed type).
        1) Minimum two (2) duplex receptacles.
        2) Minimum two (2) data outlets.
        3) Minimum one (1) single gang decora with space for future low voltage devices.
    b. Type B: 4” diameter, with multi-service system furniture connectors (power and telecom).
        1) Minimum one (1) 3/4-inch conduit with junction box for power.
        2) Minimum two (2) data outlets.
        3) Minimum one (1) 1-inch conduit with divider in poke-thru device for ~~future~~ low voltage cabling (quantities as listed in Systems Furniture Submittals).
3. Listing and Labeling: Device shall be UL listed and classified for use in fire rated floors.
4. Cover: Provide flush metal cover with modular device outlets (selection by Architect).
5. Poke-thru device openings shall be compatible with standard wiring device types and low voltage modular jacks.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install surface raceways only where indicated on Drawings.

B. Do not install nonmetallic conduit where ambient temperature exceeds 120 deg F.

C. Comply with NECA 1 and NECA 101 for installation requirements except where requirements on Drawings or in this article are stricter. Comply with NECA 102 for aluminum conduits. Comply with NFPA 70 limitations for types of raceways allowed in specific occupancies and number of floors.

D. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

E. Complete raceway installation before starting conductor installation.

A. Arrange stub-ups so curved portions of bends are not visible above finished slab.

B. Install no more than the equivalent of three 90-degree bends in any conduit run except for control wiring conduits, for which fewer bends are allowed. Support within 12 inches of changes in direction.

C. Conduit shall be run overhead unless specifically shown on drawings to run under the slab.

D. Conceal raceways within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.

E. Support conduit within 12 inches of enclosures to which attached.

F. Raceways Installed Below Slabs:
   1. Where feeders and branch circuits are permitted to run below slabs they should be installed in non-metallic conduit and encased in 3” envelope of concrete. Provide 6” layer of over fill above encasement.
   2. Conduits shall not be installed above the vapor barrier.
   3. Transition from RNC to RGC or IMC before rising above floor.

G. Stub-ups to Above Recessed Ceilings:

   1. Use EMT, IMC, or RGC for raceways.
   2. Use a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

H. Threaded Conduit Joints, Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

I. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors including conductors smaller than No. 4 AWG.

J. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to 1-1/4-inch trade size and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

K. Install raceways square to the enclosure and terminate at enclosures with locknuts. Install locknuts hand tight plus 1/4 turn more.

L. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous ground path.

M. Cut conduit perpendicular to the length. For conduits 2-inch trade size and larger, use roll cutter or a guide to make cut straight and perpendicular to the length.

N. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire. Cap underground raceways designated as spare above grade alongside raceways in use.

O. Surface Raceways:

   1. Install surface raceway with a minimum 2-inch radius control at bend points.
   2. Secure surface raceway with screws or other anchor-type devices at intervals not exceeding 48 inches and with no less than two supports per straight raceway section.

Support surface raceway according to manufacturer's written instructions. Tape and glue are not acceptable support methods.

P. Install raceway sealing fittings at accessible locations according to NFPA 70 and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings according to NFPA 70.

Q. Install devices to seal raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal the interior of all raceways at the following points:

1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2. Where an underground raceway enters a building or structure.
3. Where otherwise required by NFPA 70.

R. Expansion-Joint Fittings:

1. Install in each run of aboveground conduit crossing building expansion joints. Maintain grounding continuity. Refer to architectural plans for locations or expansion joints.

S. Mount boxes at heights indicated on Drawings. If mounting heights of boxes are not individually indicated, give priority to ADA requirements. Install boxes with height measured to top of box unless otherwise indicated.

T. Recessed Boxes in Masonry Walls: Saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall. Prepare block surfaces to provide a flat surface for a raintight connection between box and cover plate or supported equipment and box.

U. Horizontally separate boxes mounted on opposite sides of walls so they are not in the same vertical channel.

V. Locate boxes so that cover or plate will not span different building finishes.

W. Support boxes of three gangs or more from more than one side by spanning two framing members or mounting on brackets specifically designed for the purpose.

X. Fasten junction and pull boxes to or support from building structure. Do not support boxes by conduits.

Y. Floor Boxes and Poke-Thru Devices:

1. Provide dummy cover to protect equipment during construction and concrete pour.
2. Unused openings in floor boxes shall be sealed prior to concrete pour.

3.2 CONDUIT SUPPORT

A. Secure feeder conduit to basic structural elements with galvanized strap hangers and clamps; use of trapeze type hangers is encouraged for multiple conduits where space will permit. Galvanized metal clamps and screws may be used for attaching and supporting branch circuit conduit. Nonmetallic fasteners shall not be used except plastic inserts may be used in concrete for small conduits.

B. Vertical conduits shall be supported at each floor by clamps.

3.3 ANCHORS AND FASTENERS

A. Anchors and fasteners shall be of a type designed and intended for use in the base material to which the material support is to be attached and shall be capable of supporting the intended load and withstanding any associated stresses and vibrations.

B. In general, screws shall be used in wood, masonry anchors on concrete or brick, toggle bolts in hollow walls, and machine screws, bolts or welded studs on steel.

3.4 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.5 FIRESTOPPING

A. Install firestopping at penetrations of fire-rated floor and wall assemblies.

3.6 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION 26 05 33

SECTION 26 05 53 – IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Identification for raceways.
2. Identification of power and control cables.
3. Identification for conductors.
4. Warning labels and signs.
5. Instruction signs.
6. Equipment identification labels.

PART 2 - PRODUCTS

2.1 POWER AND CONTROL RACEWAY IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each raceway size.

B. Colors for Exposed Raceways:

1. Black letters on an orange field.
2. Legend: Indicate voltage and system or service type.

C. Snap-Around Labels for Raceways: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeve, with diameter sized to suit diameter of raceway or cable it identifies and to stay in place by gripping action. Provide at all splice or junction boxes and at 30’ maximum intervals.

D. Tape and Stencil for Concealed Raceways Carrying Circuits More Than 600 V: 4-inch- wide black stripes on 10-inch centers diagonally over orange background that extends full length of raceway or duct and is 12 inches wide. Stop stripes at legends. Provide legend at 30’ maximum intervals.

2.2 POWER AND CONTROL CABLE IDENTIFICATION MATERIALS

A. Comply with ANSI A13.1 for minimum size of letters for legend and for minimum length of color field for each cable size.

B. Self-Adhesive, Self-Laminating Polyester Labels: Write-on, 3-mil thick flexible label with acrylic pressure-sensitive adhesive that provides a clear, weather- and chemical-resistant, self-laminating, protective shield over the legend. Labels sized to fit the cable diameter such that the clear shield overlaps the entire printed legend. Provide label at each termination point.

C. Color-Coding Conductor Tape: Colored, self-adhesive vinyl tape not less than 3 mils thick by 1 to 2 inches wide. Provide at each field splice and termination point.

2.3 FLOOR MARKING TAPE

A. 2-inch- wide, 5-mil pressure-sensitive vinyl tape, with black and white stripes and clear vinyl overlay.

2.4 WARNING LABELS AND SIGNS

A. Comply with NFPA 70 and 29 CFR 1910.145.

B. Baked-Enamel Warning Signs:

1. Preprinted aluminum signs, punched or drilled for fasteners, with colors, legend, and size required for application.
2. 1/4-inch grommets in corners for mounting.
3. Nominal size, 7 by 10 inches.

C. Warning label and sign shall include, but are not limited to, the following legends:

1. Multiple Power Source Warning: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT HAS MULTIPLE POWER SOURCES."
2. Workspace Clearance Warning: "WARNING - OSHA REGULATION - AREA IN FRONT OF ELECTRICAL EQUIPMENT MUST BE KEPT CLEAR FOR 36 INCHES."

2.5 INSTRUCTION SIGNS

A. Engraved, laminated acrylic or melamine plastic, minimum 1/16-inch-thick for signs up to 20 sq. inches and 1/8 inch thick for larger sizes.

1. Engraved legend with black letters on white face.
2. Punched or drilled for mechanical fasteners.
3. Framed with mitered acrylic molding and arranged for attachment at applicable equipment.

2.6 EQUIPMENT IDENTIFICATION LABELS

A. Engraved, Laminated Acrylic or Melamine Label: Punched or drilled for screw mounting. White letters on a black background. Minimum letter height shall be 3/8 inch.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Location: Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Apply only to finished surfaces.

B. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.

C. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.

D. System Identification Color-Coding Bands for Raceways and Cables: Each color-coding band shall completely encircle cable or conduit. Place adjacent bands of two-color markings in contact, side by side. Locate bands at changes in direction, at penetrations of walls and floors,

at 50-foot maximum intervals in straight runs, and at 25-foot maximum intervals in congested areas.

E. Cable Ties: For attaching tags. Use general-purpose type, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.2 IDENTIFICATION SCHEDULE

A. Power-Circuit Conductor Identification, 600 V or Less: For conductors in vaults, pull and junction boxes, manholes, and handholes, use color-coding conductor tape to identify the phase.

1. Color-Coding for Phase Identification, 600 V or Less: Use colors listed below for ungrounded conductors.

a. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
b. Colors for 208/120-V Circuits:

1) Phase A: Black.
2) Phase B: Red.
3) Phase C: Blue.

c. Field-Applied, Color-Coding Conductor Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply last two turns of tape with no tension to prevent possible unwinding. Locate bands to avoid obscuring factory cable markings.

B. Auxiliary Electrical Systems Conductor Identification: Identify field-installed alarm, control, and signal connections.

1. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, and pull points. Identify by system and circuit designation.
2. Use system of marker tape designations that is uniform and consistent with system used by manufacturer for factory-installed connections.
3. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and the Operation and Maintenance Manual.

C. Workspace Indication: Install floor marking tape to show working clearances in the direction of access to live parts. Workspace shall be as required by NFPA 70 and 29 CFR 1926.403 unless otherwise indicated. Do not install at flush-mounted panelboards and similar equipment in finished spaces.

D. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting:
1. Identify system voltage with black letters on an orange background.
2. Apply to exterior of door, cover, or other access.
3. For equipment with multiple power or control sources, identify all sources:
a. Power transfer switches.
b. Controls with external control power connections.

E. Operating Instruction Signs: Install instruction signs to facilitate proper operation and maintenance of electrical systems and items to which they connect. Install instruction signs with approved legend where instructions are needed for system or equipment operation.

F. Electrical Service Equipment: Electrical service equipment shall be provided with an equipment label identifying the available fault current at the equipment bus.

G. Equipment Identification Labels: On each unit of equipment, install unique designation label that is consistent with wiring diagrams, schedules, and the Operation and Maintenance Manual.

1. Labeling Instructions:

a. Provide a single line of text with 1/2-inch- high letters on 1-1/2-inch- high label; where two lines of text are required, use labels 2 inches high.
b. Elevated Components: Increase sizes of labels and letters to those appropriate for viewing from the floor.
c. Fasten labels with appropriate mechanical fasteners that do not change the NEMA or NRTL rating of the enclosure.

2. Equipment to Be Labeled:

a. Panelboards: Typewritten directory of circuits in the location provided by panelboard manufacturer.
b. Enclosures and electrical cabinets.
c. Access doors and panels for concealed electrical items.
d. Enclosed switches.
e. Enclosed circuit breakers.
f. Enclosed controllers.
g. Push-button stations.
h. Power transfer equipment.
i. Contactors.
j. Remote-controlled switches, dimmer modules, and control devices.
k. Monitoring and control equipment.

END OF SECTION 26 05 53

SECTION 26 09 23 – LIGHTING CONTROL DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Indoor occupancy sensors.

PART 2 - PRODUCTS

2.1 INDOOR OCCUPANCY SENSORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   1. Acuity Controls; nLight.
   2. Crestron
   3. Lutron Electronics Co., Inc.
   4. Cooper Controls
   5. Watt Stopper.

B. Devices Types: Devices located in stairwells shall be ultrasonic type. All other locations shall be dual-technology (PIR and Ultrasonic) type, unless otherwise noted on drawings or in this specification.

C. General Requirements for Sensors: Wall- or ceiling-mounted, solid-state indoor occupancy sensors with a separate power pack.

   1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
   2. Operation: Unless otherwise indicated, turn lights on when coverage area is occupied, and turn them off when unoccupied; with a time delay for turning lights off, adjustable over a minimum range of 1 to 15 minutes.
   3. Sensor Output: Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack.
   4. Power Pack: Dry contacts rated for 20-A ballast/driver load at 120- and 277-V ac, and for 1 hp at 120-V ac. Sensor has 24-V dc, 150-mA, Class 2 power source, as defined by NFPA 70.
   5. Mounting:

      a. Sensor: Suitable for mounting in any position on a standard outlet box.
      b. Relay: Externally mounted through a 1/2-inch knockout in a standard electrical enclosure.
      c. Time-Delay and Sensitivity Adjustments: Recessed and concealed behind hinged door.

   6. Indicator: Digital display, to show when motion is detected during testing and normal operation of sensor.
   7. Bypass Switch: Override the "on" function in case of sensor failure.
   8. Adaptive Technology: Self-adjusting circuitry detects and memorizes usage patterns of the space and help eliminate false "off" switching.
   9. Automatic Light-Level Sensor: Adjustable from 2 to 200 fc; turn lights off when selected lighting level is present.

D. General Requirements for Sensors: Automatic-wall-switch occupancy sensor, suitable for mounting in a single gang switchbox.

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
2. Operating Ambient Conditions: Dry interior conditions, 32 to 120 deg F.
3. Switch Rating:
   a. Line Voltage Units: Not less than 800-VA fluorescent or LED at 120 V, 1200-VA fluorescent or LED at 277 V.
   b. Low Voltage Units: Suitable for use with relay-based lighting control system. Contacts rated to operate the connected relay, complying with UL 773A. Sensor is powered from the power pack relay.
4. Onboard 0-10V dimming control (sinking) with integral rocker switch for adjusting light levels up/down.

2.2 CONDUCTORS AND CABLES

A. Power Wiring to Supply Side of Remote-Control Power Sources: Not smaller than No. 12 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Classes 2 and 3 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 22 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Class 1 Control Cable: Multiconductor cable with stranded-copper conductors not smaller than No. 14 AWG. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

PART 3 - EXECUTION

3.1 SENSOR INSTALLATION

A. Coordinate layout and installation of ceiling-mounted devices with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, smoke detectors, fire-suppression systems, and partition assemblies.

B. Install and aim sensors in locations to achieve not less than 90 percent coverage of areas indicated. Do not exceed coverage limits specified in manufacturer's written instructions.

3.2 WIRING INSTALLATION

A. Wiring within Enclosures: Comply with NECA 1. Separate power-limited and nonpower-limited conductors according to conductor manufacturer's written instructions.

B. Size conductors according to lighting control device manufacturer's written instructions unless otherwise indicated.

C. Splices, Taps, and Terminations: Make connections only on numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures.

3.3 IDENTIFICATION

A. Identify components and power and control wiring according to Section 260553 "Identification for Electrical Systems."

1. Identify controlled circuits in lighting contactors.
2. Identify circuits or luminaires controlled by photoelectric and occupancy sensors at each sensor.

B. Label time switches and contactors with a unique designation.

3.4 FIELD QUALITY CONTROL

A. Testing Agency: Engage a qualified testing agency to evaluate lighting control devices and perform tests and inspections.

B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.

C. Perform the following tests and inspections with the assistance of a factory-authorized service representative:

1. Operational Test: After installing time switches and sensors, and after electrical circuitry has been energized, start units to confirm proper unit operation.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

D. Lighting control devices will be considered defective if they do not pass tests and inspections.

E. Prepare test and inspection reports.

3.5 ADJUSTING

A. Occupancy Adjustments: When requested within twelve (12) months from date of Substantial Completion, provide on-site assistance in adjusting sensors to suit actual occupied conditions. Provide up to two (2) visits to Project during other-than-normal occupancy hours for this purpose.

1. For occupancy and motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.

3.6 DEMONSTRATION

A. Coordinate demonstration of products specified in this Section with demonstration requirements for low-voltage, programmable lighting control systems specified in Section 26 09 43 "Relay-Based Lighting Controls".

B. Train Owner's maintenance personnel to adjust, operate, and maintain lighting control devices.

END OF SECTION 26 09 23

SECTION 26 27 26 – WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Receptacles, receptacles with integral GFCI
   2. Weather-resistant receptacles.
   3. Snap switches.
   4. Device cover plates.

1.2 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. UTP: Unshielded twisted pair.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

   1. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1.4 ACTION SUBMITTALS

A. Product data: For each type of device and component indicated. Include manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain all wiring devices and associated wall plates from single source from single manufacturer.

   1. Products: Subject to compliance with requirements, provide one of the following:
      a. Cooper
      b. Hubbell
      c. Legrand
      d. Leviton
      e. Lutron
      f. Pass & Seymour

2.2 GENERAL WIRING-DEVICE REQUIREMENTS

A. Wiring Devices, Components, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Comply with NFPA 70.

C. Devices shall be side-wired. Devices that use modular plug-in connectors are not acceptable.

2.3 STRAIGHT-BLADE RECEPTACLES

A. Convenience Receptacles, 125 volt, 20 amp: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498, and FS W-C-596.

B. All convenience and power receptacles shall be Heavy Duty Specification grade, grounding type.

C. Weather resistant Receptacle shall be ultra-violet, corrosion, and impact resistant, with UL approved “WR” marking on face.

D. Tamper Resistant Receptacles: All 120V and 250V, 15A and 20A, non-locking type receptacles installed in the following locations shall be listed Tamper Resistant, in compliance with NEC 406.12:

1. Assembly occupancies of over 100 persons in the building, including gymnasiums and auditoriums.

E. Specialty receptacles shall be as specified on Drawings.

2.4 GFCI RECEPTACLES

A. General Description:

1. Straight blade, feed-through type, unless specified otherwise on Drawings.
2. Comply with NEMA WD 1, NEMA WD 6, UL 498, and FS W-C-596.
3. Comply with UL 943, device shall be self-testing and provide visual or audible alarm upon ground fault condition.
4. Include indicator light that shows when the GFCI has malfunctioned and no longer provides proper GFCI protection.

B. Weather resistant Receptacle shall be ultra-violet, corrosion, and impact resistant, with UL approved “WR” marking on face.

2.5 TOGGLE SWITCHES

A. Comply with NEMA WD 1, UL 20, and FS W-S-896.

B. Switches, 120/277 volt, 20 amp:

C. Key-Operated Switches, 120/277 volt, 20 amp:

1. Description: Single pole, with factory-supplied key in lieu of switch handle.

2.6 WALL PLATES

A. Single and combination types shall match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.
2. Material for Finished Spaces:
   a. High impact smooth nylon.
3. Material for Unfinished Spaces: Galvanized steel.
4. Material for Damp Locations: Cast aluminum with spring-loaded lift cover and listed and labeled for use in wet and damp locations.

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with Type 3R, weather-resistant, die-cast aluminum with lockable cover.

2.7 FINISHES

A. Device Color:

1. Wiring Devices: As selected by Architect, unless otherwise indicated or required by NFPA 70 or device listing.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including mounting heights listed in that standard, unless otherwise indicated.

B. Coordination with Other Trades:

1. Protect installed devices and their boxes. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of boxes.
2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.
3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.
4. Install wiring devices after all wall preparation, including final painting, is complete.

C. Conductors:
1. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.
2. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.
3. Existing Conductors:
   a. Cut back and pigtail, or replace all damaged conductors.
   b. Straighten conductors that remain and remove corrosion and foreign matter.
   c. Pigtailing existing conductors is permitted, provided the outlet box is large enough.

D. Device Installation:

1. Replace devices that have been in temporary use during construction and that were installed before building finishing operations were complete.

2. Do not remove surface protection, such as plastic film and smudge covers, until immediately prior to occupancy.
3. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.
4. Tighten unused terminal screws on the device.
5. When mounting into metal boxes, remove the fiber or plastic washers used to hold device-mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Devices shall be installed vertically with ground pin up, where explicitly shown to be mounted horizontally, position the ground pin to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening. The use of caulk around device plates to seal gaps shall not be permitted.

G. Adjust mounting height and location of Devices: Where devices are installed to serve furniture or furnishings, or otherwise located in the vicinity of furniture or furnishings, the mounting height and location of such Devices shall be adjusted to permit full access to the Devices without the need to move furniture or furnishings. Provide proposed modifications of mounting height and locations for each Device to be changed to Engineer for approval prior to rough-in of said Device.

3.2 WEATHER RESISTANT RECEPTACLES

A. All 125 volt, 15 amp and 20 amp receptacles installed in damp or wet locations shall be UL listed as weather-resistant and have “WR” mark on face of receptacle. Receptacles installed outside shall be provided with a weather-proof “in-use” cover.

3.3 IDENTIFICATION

A. Comply with Section 260553 "Identification for Electrical Systems."

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:
1. Test Instruments: Use instruments that comply with UL 1436.
2. Test Instrument for Convenience Receptacles: Digital wiring analyzer with digital readout or illuminated digital-display indicators of measurement.

B. Tests for Convenience Receptacles:

1. Line Voltage: Acceptable range is 105 to 132 V.
2. Percent Voltage Drop under 15-A Load: A value over 5 percent is unacceptable.
3. Ground Impedance: Values of up to 2 ohms are acceptable.
4. GFCI Trip: Test for tripping values specified in UL 1436 and UL 943.
5. Using the test plug, verify that the device and its outlet box are securely mounted.
6. Tests shall be diagnostic, indicating damaged conductors, high resistance at the circuit breaker, poor connections, inadequate fault current path, defective devices, or similar problems. Correct circuit conditions, remove malfunctioning units and replace with new ones, and retest as specified above.

C. Wiring device shall be considered defective if it does not pass tests and inspections.

D. Prepare test and inspection reports.

END OF SECTION 26 27 26

SECTION 26 51 19 – LED INTERIOR LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes requirements for LED luminaires indicated in the Luminaire Schedule on the drawings.

B. Luminaire supports.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color Rendering Index.

C. Fixture: See "Luminaire."

D. IP: International Protection or Ingress Protection Rating.

E. LED: Light-emitting diode.

F. Lumen: Measured output of lamp and luminaire, or both.

G. Luminaire: Complete lighting unit, including lamp, reflector, and housing.

1.3 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Arrange in order of luminaire designation.
2. Include data on features, accessories, and finishes.
3. Include physical description and dimensions of luminaires.
4. Include emergency lighting units, including batteries and chargers.
5. Include life, output (lumens, CCT, and CRI), and energy-efficiency data.
6. Photometric data and adjustment factors based on laboratory tests IES LM-79 and IES LM-80.

    a. Manufacturers' Certified Data: Photometric data certified by manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.
    b. Testing Agency Certified Data: For indicated luminaires, photometric data certified by a qualified independent testing agency. Photometric data for remaining luminaires shall be certified by manufacturer.
7. LED driver or power supply product data sheets for each luminaire.

B. Shop Drawings: For nonstandard or custom luminaires.

1. Include plans, elevations, sections, and mounting and attachment details.
2. Include details of luminaire assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

3. Include diagrams for power, signal, and control wiring.
4. Where specifically indicated on plans, include photometric PxP drawings for areas where alternate fixtures are supplied.

C. Product Schedule: For luminaires and lamps. Use same designations indicated on Drawings.

1.4 MAINTENANCE MATERIAL SUBMITTALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Non-custom luminaires – Minimum of 10% to total quantity or two (2) spare luminaire per type, whichever is the larger quantity.

1.5 QUALITY ASSURANCE

A. Provide luminaires from a single manufacturer for each luminaire type.

B. Each luminaire type shall be binned within a three-step MacAdam Ellipse to ensure color consistency among luminaires.

C. Mockups: For interior luminaires in room or module mockups, complete with power and control connections.

1. Obtain Architect's approval of luminaires in mockups before starting installations.
2. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
3. Approval of mockups does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
4. Subject to compliance with requirements, approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.

1.6 WARRANTY

A. Warranty: Manufacturer and Installer agree to repair or replace components of luminaires that fail in materials or workmanship within specified warranty period.

B. Warranty Period: FIVE year(s) from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Provide luminaires as scheduled on the Drawings.

B. Provide luminaires with integral thermal protection.

C. LED luminaire shall be modular in design with the ability to replace individual components (LED Modules, drivers, etc.) without having to replace the entire luminaire.

D. All LED luminaire shall have a minimum CRI of 80.

E. Unless specifically indicated otherwise per the luminaire schedule, all LED lamp CCT shall be 4000K.

F. LED/LED Module and driver shall be rated for a minimum of 50,000 hours of life at 80% output (LM-80).

G. For each type Luminaire, the LED/LED Module shall originate from a common manufactured batch source.

H. All LED/LED Module shall adhere to LED package manufacturer guidelines, certification programs, and test procedures for thermal management.

I. Driver shall be FCC Part 15 compliant, UL 8750.

J. Driver shall meet ANSI C62.41 category A surge protection standards up to 4kV.

K. All LED drivers shall have a power factor greater than 0.90.

L. Emergency LED battery pack shall be integral mounted, ninety (90) minute capacity, sealed maintenance free nickel cadmium battery and integral charger, operate at rated lumen output of fixture or next highest lumen output available providing no less than 50% of the standard lumen output, and have remote mountable charging indicator light and test switch. LED drivers shall feature a self-diagnostic circuit that automatically tests unit and reports failure with an audible and visual alarm.

M. Ambient Temperature: Indoor Luminaires, 41 to 104 deg F.; Outdoor Luminaires, 5 to 104 deg F.

1. Relative Humidity: Zero to 95 percent.

2.2 LUMINAIRE REQUIREMENTS

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

B. Factory-Applied Labels: Comply with UL 1598. Include recommended lamps. Locate labels where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp characteristics:

a. "USE ONLY" and include specific lamp type.
b. Lamp diameter, shape, size, wattage, and coating.
c. CCT and CRI.

C. Recessed luminaires shall comply with NEMA LE 4.

D. NRTL Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by an NRTL.

E. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

F. California Title 24 compliant.

2.3 METAL FINISHES

A. Variations in finishes are unacceptable in the same piece. Variations in finishes of adjoining components are acceptable if they are within the range of approved Samples and if they can be and are assembled or installed to minimize contrast.

2.4 LUMINAIRE SUPPORT

A. Comply with requirements in Section 260529 "Hangers and Supports for Electrical Systems" for channel and angle iron supports and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch minimum diameter steel tubing with swivel ball fittings and ceiling canopy. Finish same as luminaire.

C. Wires: ASTM A 641/A 641 M, Class 3, soft temper, zinc-coated steel, 14 AWG. Min.

D. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

E. Hook Hangers: Integrated assembly matched to luminaire, line voltage, and equipment with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine roughing-in for luminaire to verify actual locations of luminaire and electrical connections before luminaire installation.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 TEMPORARY LIGHTING

A. If approved by the Architect, use selected permanent luminaires for temporary lighting. When construction is sufficiently complete, clean luminaires used for temporary lighting and install new lamps.

3.3 INSTALLATION

A. Comply with NECA 1.

B. Install luminaires level, plumb, and square with ceilings and walls unless otherwise indicated.

C. Regardless of locations shown or mounting heights indicated on drawings, do not rough or install luminaires in locations where they conflict with existing or new equipment. Luminaires that are installed in locations or heights that conflict with the work of other trades, or conflict with the operation or maintenance requirements of equipment shown in the construction drawings shall be relocated as required to resolve such conflicts at the contractor’s expense.

D. Supports:

1. Sized and rated for luminaire weight.
2. Able to maintain luminaire position after cleaning and relamping.
3. Provide support for luminaire without causing deflection of ceiling or wall.
4. Luminaire-mounting devices shall be capable of supporting a horizontal force of 100 percent of luminaire weight and a vertical force of 400 percent of luminaire weight.

E. Flush-Mounted Luminaires:

1. Secured to outlet box.
2. Attached to ceiling structural members at four points equally spaced around circumference of luminaire.
3. Trim ring flush with finished surface.

F. Wall-Mounted Luminaires:

1. Where recommended by luminaire manufacturer, attach to structural members in walls. Otherwise mount fixture to back box.
2. Do not attach luminaires directly to gypsum board.

G. Suspended Luminaires:

1. Ceiling Mount:
   a. Provide quantity of stems or adjustable aircraft cable to support suspended fixtures as described in the luminaire schedule and manufactures installation instructions.

2. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
3. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers. Support with approved outlet box and accessories that hold stem and provide damping of luminaire oscillations. Support outlet box vertically to building structure using approved devices.
4. Continuous Rows of Luminaires: Use stems, rod, or aircraft cable support as indicated in luminaire schedule, for suspension of each unit length of luminaire chassis, including one at each end. Maximum span shall not exceed 12'.
5. Do not use ceiling grid as support for pendant luminaires. Connect support wires or rods to building structure.

H. Ceiling-Grid-Mounted Luminaires:

1. Secure to any required outlet box.
2. Secure luminaire to the luminaire opening using approved fasteners in a minimum of four locations, spaced near corners of luminaire.
3. Use approved devices and support components to connect luminaire to ceiling grid in a minimum of four locations, spaced near corners of luminaire.
4. Do not use ceiling grid as support for luminaires. Support with aircraft cable or similar wire from building structure from a minimum of TWO locations, independent of the ceiling system.

I. Comply with requirements in Section 260519 "Low-Voltage Electrical Power Conductors and Cables" for wiring connections.

3.4 IDENTIFICATION

A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.5 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Operational Test: After installing luminaires, switches, and accessories, and after electrical circuitry has been energized, test units to confirm proper operation.
2. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery power and retransfer to normal.

B. Luminaire will be considered defective if it does not pass operation tests and inspections.

C. Prepare test and inspection reports.

3.6 STARTUP SERVICE

A. Comply with requirements for startup specified in Section 260943 "Relay-Based Lighting Controls."

3.7 ADJUSTING

A. Occupancy Adjustments: When requested within TWELVE months of date of Substantial Completion, provide on-site assistance in adjusting the direction of aim of luminaires to suit occupied conditions. Make up to TWO visits to Project during other-than-normal hours for this purpose. Some of this work may be required during hours of darkness.

1. During adjustment visits, inspect all luminaires. Replace lamps or luminaires that are defective.
2. Parts and supplies shall be manufacturer's authorized replacement parts and supplies.
3. Adjust the aim of luminaires in the presence of the Architect.

END OF SECTION 26 51 19