Specifications for:

Scattered Sites Modernization Project 2026

Springfield Metropolitan
HOUSING AUTHORITY

Prepared for:

Springfield Metropolitan Housing Authority
2026 W. Main Street
Springfield, Ohio 45504
937.325.7331

Prepared by:

RDA GROUP ARCHITECTS
7662 PARAGON ROAD | DAYTON, OH 45459 | 937.610.3440

Bid / Construction Set
January 9, 2026

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SPRINGFIELD METROPOLITAN HOUSING AUTHORITY

PROJECT MANUAL

Including Contract Bid Documents and Technical Specifications

For

Scattered Sites Modernization 2026

SPRINGFIELD METROPOLITAN HOUSING AUTHORITY

By:_____

Ms. Michelle Lee- Hall, Executive Director

Date:_____

CONTRACTOR

By:_____

Title:_____

Date:_____

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GENERAL AND CONTRACT DOCUMENTS / REQUIREMENTS

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INVITATION TO BID

The Springfield Metropolitan Housing Authority, Springfield, Ohio will receive sealed bids for the **Scattered Sites Modernization 2026 Project** at 11:00 AM on February 10, 2026, at which time and place all bids will be publicly opened and read aloud.

This aforementioned scope of work will be let under one (1) contract.

Owner: Springfield Metropolitan Housing Authority
2026 West Main Street
Springfield, OH 45504
937.325.7331x209

Architect: RDA Group Architects, LLC
7662 Paragon Road
Dayton, OH 45459
937.610.3440

Electronic Copies of the bidding documents may be obtained upon request from RDA by emailing Jonathan Schaaf at JRS@rda-group.com. The cost of printing shall be the responsibility of the bidder with no refund.

A pre-bid conference will be held at 1:00 PM on January 22, 2026, at SMHA Offices, 2026 West Main Street, Springfield, Ohio. Site visits will follow so plan time accordingly. The scope and details of the proposed project work will be discussed. Attendance is recommended.

A certified check or bank draft, payable to Springfield Metropolitan Housing Authority, Par Value US Government Bonds or satisfactory bid bond executed by the acceptable sureties in an amount equal to five percent of the bid shall be submitted with each bid. Failure to submit a proper bid bond will automatically render the bid nonresponsive.

Attention is called to the provisions for equal employment opportunity; payment of not less than the prevailing salaries and wages; and tax-exempt status for all Federal, State, Local, and/or Excise Taxes, as set forth in the Contract Documents, that must be adhered to on this project.

All questions are due by 3:00 PM on January 23, 2026. Any questions or concerns should be addressed to Mr. Xavier Gullatte, Procurement Director, at Springfield Metropolitan Housing Authority at 937.325.7331 or email **procurement@smhaohio.org**

Springfield Metropolitan Housing Authority reserves the right to reject any or all bids or to waive any informalities in the bidding that does not materially alter the bid item. No bid shall be withdrawn for a period of sixty (60) days subsequent to the opening of bids without the consent of Springfield Metropolitan Housing Authority.

Sealed bids are to be submitted to the attention of: Mr. Xavier Gullatte, Procurement Director, at Springfield Metropolitan Housing Authority, 2026 West Main Street, Springfield, OH 45504

WE ARE AN EQUAL OPPORTUNITY EMPLOYER

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U.S. Department of Housing and Urban Development

Office of Public and Indian Housing

Instructions to Bidders for Contracts Public and Indian Housing Programs

Instructions to Bidders for Contracts

Public and Indian Housing Programs

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1. Bid Preparation and Submission

(a) Bidders are expected to examine the specifications, drawings, all instructions, and, if applicable, the construction site (see also the contract clause entitled **Site Investigation and Conditions Affecting the Work** of the *General Conditions of the Contract for Construction*). Failure to do so will be at the bidders' risk.

(b) All bids must be submitted on the forms provided by the Public Housing Agency/Indian Housing Authority (PHA/IHA). Bidders shall furnish all the information required by the solicitation. Bids must be signed and the bidder's name typed or printed on the bid sheet and each continuation sheet which requires the entry of information by the bidder. Erasures or other changes must be initialed by the person signing the bid. Bids signed by an agent shall be accompanied by evidence of that agent's authority. (Bidders should retain a copy of their bid for their records.)

(c) Bidders must submit as part of their bid a completed form HUD-5369-A, "Representations, Certifications, and Other Statements of Bidders."

(d) All bid documents shall be sealed in an envelope which shall be clearly marked with the words "Bid Documents," the Invitation for Bids (IFB) number, any project or other identifying number, the bidder's name, and the date and time for receipt of bids.

(e) If this solicitation requires bidding on all items, failure to do so will disqualify the bid. If bidding on all items is not required, bidders should insert the words "No Bid" in the space provided for any item on which no price is submitted.

(f) Unless expressly authorized elsewhere in this solicitation, alternate bids will not be considered.

(g) Unless expressly authorized elsewhere in this solicitation, bids submitted by telegraph or facsimile (fax) machines will not be considered.

(h) If the proposed contract is for a Mutual Help project (as described in 24 CFR Part 905, Subpart E) that involves Mutual Help contributions of work, material, or equipment, supplemental information regarding the bid advertisement is provided as an attachment to this solicitation.

2. Explanations and Interpretations to Prospective Bidders

(a) Any prospective bidder desiring an explanation or interpretation of the solicitation, specifications, drawings, etc., must request it at least 7 days before the scheduled time for bid opening. Requests may be oral or written. Oral requests must be confirmed in writing. The only oral clarifications that will be provided will be those clearly related to solicitation procedures, i.e., not substantive technical information. No other oral explanation or interpretation will be provided. Any information given a prospective bidder concerning this solicitation will be furnished promptly to all other prospective bidders as a written amendment to the solicitation, if that information is necessary in submitting bids, or if the lack of it would be prejudicial to other prospective bidders.

(b) Any information obtained by, or provided to, a bidder other than by formal amendment to the solicitation shall not constitute a change to the solicitation.

3. Amendments to Invitations for Bids

(a) If this solicitation is amended, then all terms and conditions which are not modified remain unchanged.

(b) Bidders shall acknowledge receipt of any amendment to this solicitation (1) by signing and returning the amendment, (2) by identifying the amendment number and date on the bid form, or (3) by letter, telegram, or facsimile, if those methods are authorized in the solicitation. The PHA/IHA must receive acknowledgement by the time and at the place specified for receipt of bids. Bids which fail to acknowledge the bidder's receipt of any amendment will result in the rejection of the bid if the amendment(s) contained information which substantively changed the PHA's/IHA's requirements.

(c) Amendments will be on file in the offices of the PHA/IHA and the Architect at least 7 days before bid opening.

4. Responsibility of Prospective Contractor

(a) The PHA/IHA will award contracts only to responsible prospective contractors who have the ability to perform successfully under the terms and conditions of the proposed contract. In determining the responsibility of a bidder, the PHA/IHA will consider such matters as the bidder's:

(1) Integrity;

(2) Compliance with public policy;

(3) Record of past performance; and

(4) Financial and technical resources (including construction and technical equipment).

(b) Before a bid is considered for award, the bidder may be requested by the PHA/IHA to submit a statement or other documentation regarding any of the items in paragraph (a) above. Failure by the bidder to provide such additional information shall render the bidder nonresponsible and ineligible for award.

5. Late Submissions, Modifications, and Withdrawal of Bids

(a) Any bid received at the place designated in the solicitation after the exact time specified for receipt will not be considered unless it is received before award is made and it:

(1) Was sent by registered or certified mail not later than the fifth calendar day before the date specified for receipt of offers (e.g., an offer submitted in response to a solicitation requiring receipt of offers by the 20th of the month must have been mailed by the 15th);

(2) Was sent by mail, or if authorized by the solicitation, was sent by telegram or via facsimile, and it is determined by the PHA/IHA that the late receipt was due solely to mishandling by the PHA/IHA after receipt at the PHA/IHA; or

(3) Was sent by U.S. Postal Service Express Mail Next Day Service - Post Office to Addressee, not later than 5:00 p.m. at the place of mailing two working days prior to the date specified for receipt of proposals. The term "working days" excludes weekends and observed holidays.

(b) Any modification or withdrawal of a bid is subject to the same conditions as in paragraph (a) of this provision.

(c) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent either by registered or certified mail is the U.S. or Canadian Postal Service postmark both on the envelope or wrapper and on the original receipt from the U.S. or Canadian Postal Service. Both postmarks must show a legible date or the bid, modification, or withdrawal shall be processed as if mailed late. "Postmark" means a printed, stamped, or otherwise placed impression (exclusive of a postage meter machine impression) that is readily identifiable without further action as having been supplied and affixed by employees of the U.S. or Canadian Postal Service on the date of mailing. Therefore, bidders should request the postal clerk to place a hand cancellation bull's-eye postmark on both the receipt and the envelope or wrapper.

(d) The only acceptable evidence to establish the time of receipt at the PHA/IHA is the time/date stamp of PHA/IHA on the proposal wrapper or other documentary evidence of receipt maintained by the PHA/IHA.

(e) The only acceptable evidence to establish the date of mailing of a late bid, modification, or withdrawal sent by Express Mail Next Day Service-Post Office to Addressee is the date entered by the post office receiving clerk on the "Express Mail Next Day Service-Post Office to Addressee" label and the postmark on both the envelope or wrapper and on the original receipt from the U.S. Postal Service. "Postmark" has the same meaning as defined in paragraph (c) of this provision, excluding postmarks of the Canadian Postal Service. Therefore, bidders should request the postal clerk to place a legible hand cancellation bull's eye postmark on both the receipt and Failure by a bidder to acknowledge receipt of the envelope or wrapper.

(f) Notwithstanding paragraph (a) of this provision, a late modification of an otherwise successful bid that makes its terms more favorable to the PHA/IHA will be considered at any time it is received and may be accepted.

(g) Bids may be withdrawn by written notice, or if authorized by this solicitation, by telegram (including mailgram) or facsimile machine transmission received at any time before the exact time set for opening of bids; provided that written confirmation of telegraphic or facsimile withdrawals over the signature of the bidder is mailed and postmarked prior to the specified bid opening time. A bid may be withdrawn in person by a bidder or its authorized representative if, before the exact time set for opening of bids, the identity of the person requesting withdrawal is established and the person signs a receipt for the bid.

6. Bid Opening

All bids received by the date and time of receipt specified in the solicitation will be publicly opened and read. The time and place of opening will be as specified in the solicitation. Bidders and other interested persons may be present.

7. Service of Protest

(a) Definitions. As used in this provision:

"Interested party" means an actual or prospective bidder whose direct economic interest would be affected by the award of the contract.

"Protest" means a written objection by an interested party to this solicitation or to a proposed or actual award of a contract pursuant to this solicitation.

(b) Protests shall be served on the Contracting Officer by obtaining written and dated acknowledgement from —

[Contracting Officer designate the official or location where a protest may be served on the Contracting Officer]

(c) All protests shall be resolved in accordance with the PHA's/IHA's protest policy and procedures, copies of which are maintained at the PHA/IHA.

8. Contract Award

(a) The PHA/IHA will evaluate bids in response to this solicitation without discussions and will award a contract to the responsible bidder whose bid, conforming to the solicitation, will be most advantageous to the PHA/IHA considering only price and any price-related factors specified in the solicitation.

(b) If the apparent low bid received in response to this solicitation exceeds the PHA's/IHA's available funding for the proposed contract work, the PHA/IHA may either accept separately priced items (see 8(e) below) or use the following procedure to determine contract award. The PHA/IHA shall apply in turn to each bid (proceeding in order from the apparent low bid to the high bid) each of the separately priced bid deductible items, if any, in their priority order set forth in this solicitation. If upon the application of the first deductible item to all initial bids, a new low bid is within the PHA's/IHA's available funding, then award shall be made to that bidder. If no bid is within the available funding amount, then the PHA/IHA shall apply the second deductible item. The PHA/IHA shall continue this process until an evaluated low bid, if any, is within the PHA's/IHA's available funding. If upon the application of all deductibles, no bid is within the PHA's/IHA's available funding, or if the solicitation does not request separately priced deductibles, the PHA/IHA shall follow its written policy and procedures in making any award under this solicitation.

(c) In the case of tie low bids, award shall be made in accordance with the PHA's/IHA's written policy and procedures.

(d) The PHA/IHA may reject any and all bids, accept other than the lowest bid (e.g., the apparent low bid is unreasonably low), and waive informalities or minor irregularities in bids received, in accordance with the PHA's/IHA's written policy and procedures.

(e) Unless precluded elsewhere in the solicitation, the PHA/IHA may accept any item or combination of items bid.

(f) The PHA/IHA may reject any bid as nonresponsive if it is materially unbalanced as to the prices for the various items of work to be performed. A bid is materially unbalanced when it is based on prices significantly less than cost for some work and prices which are significantly overstated for other work.

(g) A written award shall be furnished to the successful bidder within the period for acceptance specified in the bid and shall result in a binding contract without further action by either party.

9. Bid Guarantee (applicable to construction and equipment contracts exceeding $25,000)

All bids must be accompanied by a negotiable bid guarantee which shall not be less than five percent (5%) of the amount of the bid. The bid guarantee may be a certified check, bank draft, U.S. Government Bonds at par value, or a bid bond secured by a surety company acceptable to the U.S. Government and authorized to do business in the state where the work is to be performed. In the case where the work under the contract will be performed on an Indian reservation area, the bid guarantee may also be an irrevocable Letter of Credit (see provision 10, Assurance of Completion, below). Certified checks and bank drafts must be made payable to the order of the PHA/IHA. The bid guarantee shall insure the execution of the contract and the furnishing of a method of assurance of completion by the successful bidder as required by the solicitation. Failure to submit a bid guarantee with the bid shall result in the rejection of the bid. Bid guarantees submitted by unsuccessful bidders will be returned as soon as practicable after bid opening.

10. Assurance of Completion

(a) Unless otherwise provided in State law, the successful bidder shall furnish an assurance of completion prior to the execution of any contract under this solicitation. This assurance may be [Contracting Officer check applicable items] —

[x] (1) a performance and payment bond in a penal sum of 100 percent of the contract price; or, as may be required or permitted by State law;

[x] (2) separate performance and payment bonds, each for 50 percent or more of the contract price;

[x] (3) a 20 percent cash escrow;

[ ] (4) a 25 percent irrevocable letter of credit; or,

[ ] (5) an irrevocable letter of credit for 10 percent of the total contract price with a monitoring and disbursements agreement with the IHA (applicable only to contracts awarded by an IHA under the Indian Housing Program).

(b) Bonds must be obtained from guarantee or surety companies acceptable to the U.S. Government and authorized to do business in the state where the work is to be performed. Individual sureties will not be considered. U.S. Treasury Circular Number 570, published annually in the Federal Register, lists companies approved to act as sureties on bonds securing Government contracts, the maximum underwriting limits on each contract bonded, and the States in which the company is licensed to do business. Use of companies listed in this circular is mandatory. Copies of the circular may be downloaded on the U.S. Department of Treasury website **http://www.fms.treas.gov/c570/index.html**, or ordered for a minimum fee by contacting the Government Printing Office at (202) 512-2168.

(c) Each bond shall clearly state the rate of premium and the total amount of premium charged. The current power of attorney for the person who signs for the surety company must be attached to the bond. The effective date of the power of attorney shall not precede the date of the bond. The effective date of the bond shall be on or after the execution date of the contract.

(d) Failure by the successful bidder to obtain the required assurance of completion within the time specified, or within such extended period as the PHA/IHA may grant based upon reasons determined adequate by the PHA/IHA, shall render the bidder ineligible for award. The PHA/IHA may then either award the contract to the next lowest responsible bidder or solicit new bids. The PHA/IHA may retain the ineligible bidder's bid guarantee.

11. Preconstruction Conference (applicable to construction contracts)

After award of a contract under this solicitation and prior to the start of work, the successful bidder will be required to attend a preconstruction conference with representatives of the PHA/IHA and its architect/engineer, and other interested parties convened by the PHA/IHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract (e.g., Equal Employment Opportunity, Labor Standards). The PHA/IHA will provide the successful bidder with the date, time, and place of the conference.

12. Indian Preference Requirements (applicable only if this solicitation is for a contract to be performed on a project for an Indian Housing Authority)

(a) HUD has determined that the contract awarded under this solicitation is subject to the requirements of section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450e(b)). Section 7(b) requires that any contract or subcontract entered into for the benefit of Indians shall require that, to the greatest extent feasible

(1) Preferences and opportunities for training and employment (other than core crew positions; see paragraph (h) below) in connection with the administration of such contracts or subcontracts be given to qualified "Indians." The Act defines "Indians" to mean persons who are members of an Indian tribe and defines "Indian tribe" to mean any Indian tribe, band, nation, or other organized group or community, including any Alaska Native village or regional or village corporation as defined in or established pursuant to the Alaska Native Claims Settlement Act, which is recognized as eligible for the special programs and services provided by the United States to Indians because of their status as Indians; and,

(2) Preference in the award of contracts or subcontracts in connection with the administration of contracts be given to Indian organizations and to Indian-owned economic enterprises, as defined in section 3 of the Indian Financing Act of 1974 (25 U.S.C. 1452). That Act defines "economic enterprise" to mean any Indian-owned commercial, industrial, or business activity established or organized for the purpose of profit, except that the Indian ownership must constitute not less than 51 percent of the enterprise; "Indian organization" to mean the governing body of any Indian tribe or entity established or recognized by such governing body; "Indian" to mean any person who is a member of any tribe, band, group, pueblo, or community which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs and any "Native" as defined in the Alaska Native Claims Settlement Act; and Indian "tribe" to mean any Indian tribe, band, group, pueblo, or community including Native villages and Native groups (including

corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs.

(b) (1) The successful Contractor under this solicitation shall comply with the requirements of this provision in awarding all subcontracts under the contract and in providing training and employment opportunities.

(2) A finding by the IHA that the contractor, either (i) awarded a subcontract without using the procedure required by the IHA, (ii) falsely represented that subcontracts would be awarded to Indian enterprises or organizations; or, (iii) failed to comply with the contractor's employment and training preference bid statement shall be grounds for termination of the contract or for the assessment of penalties or other remedies.

(c) If specified elsewhere in this solicitation, the IHA may restrict the solicitation to qualified Indian-owned enterprises and Indian organizations. If two or more (or a greater number as specified elsewhere in the solicitation) qualified Indian-owned enterprises or organizations submit responsive bids, award shall be made to the qualified enterprise or organization with the lowest responsive bid. If fewer than the minimum required number of qualified Indian-owned enterprises or organizations submit responsive bids, the IHA shall reject all bids and readvertise the solicitation in accordance with paragraph (d) below.

(d) If the IHA prefers not to restrict the solicitation as described in paragraph (c) above, or if after having restricted a solicitation an insufficient number of qualified Indian enterprises or organizations submit bids, the IHA may advertise for bids from non-Indian as well as Indian-owned enterprises and Indian organizations. Award shall be made to the qualified Indian enterprise or organization with the lowest responsive bid if that bid is -

(1) Within the maximum HUD-approved budget amount established for the specific project or activity for which bids are being solicited; and

(2) No more than the percentage specified in 24 CFR 905.175(c) higher than the total bid price of the lowest responsive bid from any qualified bidder. If no responsive bid by a qualified Indian-owned economic enterprise or organization is within the stated range of the total bid price of the lowest responsive bid from any qualified enterprise, award shall be made to the bidder with the lowest bid.

(e) Bidders seeking to qualify for preference in contracting or subcontracting shall submit proof of Indian ownership with their bids. Proof of Indian ownership shall include but not be limited to:

(1) Certification by a tribe or other evidence that the bidder is an Indian. The IHA shall accept the certification of a tribe that an individual is a member.

(2) Evidence such as stock ownership, structure, management, control, financing and salary or profit sharing arrangements of the enterprise.

(f) (1) All bidders must submit with their bids a statement describing how they will provide Indian preference in the award of subcontracts. The specific requirements of that statement and the factors to used by the IHA in determining the statement's adequacy are included as an attachment to this solicitation. Any bid that fails to include the required statement shall be rejected as nonresponsive. The IHA may require that comparable statements be provided by subcontractors to the successful Contractor, and may require the Contractor to reject any bid or proposal by a subcontractor that fails to include the statement.

(2) Bidders and prospective subcontractors shall submit a certification (supported by credible evidence) to the IHA in any instance where the bidder or subcontractor believes it is infeasible to provide Indian preference in subcontracting. The acceptance or rejection by the IHA of the certification shall be final. Rejection shall disqualify the bid from further consideration.

(g) All bidders must submit with their bids a statement detailing their employment and training opportunities and their plans to provide preference to Indians in implementing the contract; and the number or percentage of Indians anticipated to be employed and trained. Comparable statements from all proposed subcontractors must be submitted. The criteria to be used by the IHA in determining the statement(s)'s adequacy are included as an attachment to this solicitation. Any bid that fails to include the required statement(s), or that includes a statement that does not meet minimum standards required by the IHA shall be rejected as nonresponsive.

(h) Core crew employees. A core crew employee is an individual who is a bona fide employee of the contractor at the time the bid is submitted; or an individual who was not employed by the bidder at the time the bid was submitted, but who is regularly employed by the bidder in a supervisory or other key skilled position when work is available. Bidders shall submit with their bids a list of all core crew employees.

(i) Preference in contracting, subcontracting, employment, and training shall apply not only on-site, on the reservation, or within the IHA's jurisdiction, but also to contracts with firms that operate outside these areas (e.g., employment in modular or manufactured housing construction facilities).

(j) Bidders should contact the IHA to determine if any additional local preference requirements are applicable to this solicitation.

(k) The IHA [ ] does [x] does not [Contracting Officer check applicable box] maintain lists of Indian-owned economic enterprises and Indian organizations by specialty (e.g., plumbing, electrical, foundations), which are available to bidders to assist them in meeting their responsibility to provide preference in connection with the administration of contracts and subcontracts.

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General Conditions for Construction Contracts - Public Housing Programs

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing
OMB Approval No. 2577-0157 (exp. 1/31/2027)

Applicability. This form is applicable to any construction/development contract greater than $250,000.

Public reporting burden for this collection of information is estimated to average 1.0 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. This form includes those clauses required by OMB's common rule on grantee procurement, implemented at HUD in 2 CFR 200, and those requirements set forth in Section 3 of the Housing and Urban Development Act of 1968 and its amendment by the Housing and Community Development Act of 1992, implemented by HUD at 24 CFR Part 75. The form is required for construction contracts awarded by Public Housing Agencies (PHAs). The form is used by Housing Authorities in solicitations to provide necessary contract clauses. If the form were not used, PHAs would be unable to enforce their contracts. Responses to the collection of information are required to obtain a benefit or to retain a benefit. The information requested does not lend itself to confidentiality. HUD may not conduct or sponsor, and a person is not required to respond to a collection of information unless it displays a currently valid OMB number.

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1. Definitions

(a) "Architect" means the person or other entity engaged by the PHA to perform architectural, engineering, design, and other services related to the work as provided for in the contract. When a PHA uses an engineer to act in this capacity, the terms "architect" and "engineer" shall be synonymous. The Architect shall serve as a technical representative of the Contracting Officer. The Architect's authority is as set forth elsewhere in this contract.

(b) "Contract" means the contract entered into between the PHA and the Contractor. It includes the forms of Bid, the Bid Bond, the Performance and Payment Bond or Bonds or other assurance of completion, the Certifications, Representations, and Other Statements of Bidders (form HUD-5370), these General Conditions of the Contract for Construction (form HUD-5370), the applicable wage rate determinations from the U.S. Department of Labor, any special conditions included elsewhere in the contract, the specifications, and drawings. It includes all formal changes to any of those documents by addendum, change order, or other modification.

(c) "Contracting Officer" means the person delegated the authority by the PHA to enter into, administer, and/or terminate this contract and designated as such in writing to the Contractor. The term includes any successor Contracting Officer and any duly authorized representative of the Contracting Officer also designated in writing. The Contracting Officer shall be deemed the authorized agent of the PHA in all dealings with the Contractor.

(d) "Contractor" means the person or other entity entering into the contract with the PHA to perform all of the work required under the contract.

(e) "Drawings" means the drawings enumerated in the schedule of drawings contained in the Specifications and as described in the contract clause entitled Specifications and Drawings for Construction herein.

(f) "HUD" means the United States of America acting through the Department of Housing and Urban Development including the Secretary, or any other person designated to act on its behalf. HUD has agreed, subject to the provisions of an Annual Contributions Terms and Conditions (ACC), to provide financial assistance to the PHA, which includes assistance in financing the work to be performed under this contract. As defined elsewhere in these General Conditions or the contract documents, the determination of HUD may be required to authorize changes in the work or for release of funds to the PHA for payment to the Contractor. Notwithstanding HUD's role, nothing in this contract shall be construed to create any contractual relationship between the Contractor and HUD.

(g) "Project" means the entire project, whether construction or rehabilitation, the work for which is provided for in whole or in part under this contract.

(h) "PHA" means the Public Housing Agency organized under applicable state laws which is a party to this contract.

(j) "Specifications" means the written description of the technical requirements for construction and includes the criteria and tests for determining whether the requirements are met.

(l) "Work" means materials, workmanship, and manufacture and fabrication of components.

2. Contractor's Responsibility for Work

(a) The Contractor shall furnish all necessary labor, materials, tools, equipment, and transportation necessary for performance of the work. The Contractor shall also furnish all necessary water, heat, light, and power not made available to the Contractor by the PHA pursuant to the clause entitled Availability and Use of Utility Services herein.

(b) The Contractor shall perform on the site, and with its own organization, work equivalent to at least [ ] (12 percent unless otherwise indicated) of the total amount of work to be performed under the order. This percentage may be reduced by a supplemental agreement to this order if, during performing the work, the Contractor requests a reduction and the Contracting Officer determines that the reduction would be to the advantage of the PHA.

(c) At all times during performance of this contract and until the work is completed and accepted, the Contractor shall directly superintend the work or assign and have on the work site a competent superintendent who is satisfactory to the Contracting Officer and has authority to act for the Contractor.

(d) The Contractor shall be responsible for all damages to persons or property that occur as a result of the Contractor's fault or negligence, and shall take proper safety and health precautions to protect the work, the workers, the public, and the property of others. The Contractor shall hold and save the PHA, its officers and agents, free and harmless from liability of any nature occasioned by the Contractor's performance. The Contractor shall also be responsible for all materials delivered and work performed until completion and acceptance of the entire work, except for any completed unit of work which may have been accepted under the contract.

(e) The Contractor shall lay out the work from base lines and bench marks indicated on the drawings and be responsible for all lines, levels, and measurements of all work executed under the contract. The Contractor shall verify the figures before laying out the work and will be held responsible for any error resulting from its failure to do so.

(f) The Contractor shall confine all operations (including storage of materials) on PHA premises to areas authorized or approved by the Contracting Officer.

(g) The Contractor shall at all times keep the work area, including storage areas, free from accumulations of waste materials. After completing the work and before final inspection, the Contractor shall (1) remove from the premises all scaffolding, equipment, tools, and materials (including rejected materials) that are not the property of the PHA and all rubbish caused by its work; (2) leave the work area in a clean, neat, and orderly condition satisfactory to the Contracting Officer; (3) perform all specified tests; and, (4) deliver the installation in complete and operating condition.

(h) The Contractor's responsibility will terminate when all work has been completed, the final inspection made, and the work accepted by the Contracting Officer. The Contractor will then be released from further obligation except as required by the warranties specified elsewhere in the contract.

3. Architect's Duties, Responsibilities, and Authority

(a) The Architect for this contract, and any successor, shall be designated in writing by the Contracting Officer.

(b) The Architect shall serve as the Contracting Officer's technical representative with respect to architectural, **Schedule** engineering, and design matters related to the work performed under the contract. The Architect may provide direction on contract performance. Such direction shall be within the scope of the contract and may not be of a nature which: (1) institutes additional work outside the scope of the contract; (2) constitutes a change as defined in the Changes clause herein; (3) causes an increase or decrease in the cost of the contract; (4) alters the Construction Progress Schedule; or (5) changes any of the other express terms or conditions of the contract.

(c) The Architect's duties and responsibilities may include but shall not be limited to:

(1) Making periodic visits to the work site, and on the basis of his/her on-site inspections, issuing written reports to the PHA which shall include all observed deficiencies. The Architect shall file a copy of the report with the Contractor's designated representative at the site;

(2) Making modifications in drawings and technical specifications and assisting the Contracting Officer in the preparation of change orders and other contract modifications for issuance by the Contracting Officer;

(3) Reviewing and making recommendations with respect to - (i) the Contractor's construction progress schedules; (ii) the Contractor's shop and detailed drawings; (iii) the machinery, mechanical and other equipment and materials or other articles proposed for use by the Contractor; and, (iv) the Contractor's price breakdown and progress payment estimates; and,

(4) Assisting in inspections, signing Certificates of Completion, and making recommendations with respect to acceptance of work completed under the contract.

4. Other Contracts

The PHA may undertake or award other contracts for additional work at or near the site of the work under this contract. The Contractor shall fully cooperate with the other contractors and with PHA employees and shall carefully adapt scheduling and performing the work under this contract to accommodate the additional work, heeding any direction that may be provided by the Contracting Officer. The Contractor shall not commit or permit any act that will interfere with the performance of work by any other contractor or by PHA employees

Construction Requirements

5. Pre-construction Conference and Notice to Proceed

(a) Within ten calendar days of contract execution, and prior to the commencement of work, the Contractor shall attend a preconstruction conference with representatives of the PHA, its Architect, and other interested parties convened by the PHA. The conference will serve to acquaint the participants with the general plan of the construction operation and all other requirements of the contract. The PHA will provide the Contractor with the date, time, and place of the conference.

(b) The contractor shall begin work upon receipt of a written Notice to Proceed from the Contracting Officer or designee. The Contractor shall not begin work prior to receiving such notice.

6. Construction Progress

(a) The Contractor shall, within five days after the work commences on the contract or another period of time determined by the Contracting Officer, prepare and submit to the Contracting Officer for approval three copies of a practicable schedule showing the order in which the Contractor proposes to perform the work, and the dates on which the Contractor contemplates starting and completing the several salient features of the work (including acquiring labor, materials, and equipment). The schedule shall be in the form of a progress chart of suitable scale to indicate appropriately the percentage of work scheduled for completion by any given date during the period. If the Contractor fails to submit a schedule within the time prescribed, the Contracting Officer may withhold approval of progress payments or take other remedies under the contract until the Contractor submits the required schedule.

(b) The Contractor shall enter the actual progress on the chart as required by the Contracting Officer, and immediately deliver three copies of the annotated schedule to the Contracting Officer. If the Contracting Officer determines, upon the basis of inspection conducted pursuant to the clause entitled Inspection and Acceptance of Construction, herein that the Contractor is not meeting the approved schedule, the Contractor shall take steps necessary to improve its progress, including those that may be required by the Contracting Officer, without additional cost to the PHA. In this circumstance, the Contracting Officer may require the Contractor to increase the number of shifts, overtime operations, days of work, and/or the amount of construction plant, and to submit for approval any supplementary schedule or schedules in chart form as the Contracting Officer deems necessary to demonstrate how the approved rate of progress will be regained.

(c) Failure of the Contractor to comply with the requirements of the Contracting Officer under this clause shall be grounds for a determination by the Contracting Officer that the Contractor is not prosecuting the work with sufficient diligence to ensure completion within the time specified in the Contract. Upon making this determination, the Contracting Officer may terminate the Contractor's right to proceed with the work, or any separable part of it, in accordance with the Default clause of this contract.

7. Site Investigation and Conditions Affecting the Work

(a) The Contractor acknowledges that it has taken steps reasonably necessary to ascertain the nature and location of the work, and that it has investigated and satisfied itself as to the general and local conditions which can affect the work or its cost, including but not limited to, (1) conditions bearing upon transportation, disposal, handling, and storage of materials; (2) the availability of labor, water, electric power, and roads;(3) uncertainties of weather, river stages, tides, or similar physical conditions at the site; (4) the conformation and conditions of the ground; and (5) the character of equipment and facilities needed preliminary to and during work performance. The Contractor also acknowledges that it has satisfied itself as to the character, quality, and quantity of surface and subsurface materials or obstacles to be encountered insofar as this information is

reasonably ascertainable from an inspection of the site, including all exploratory work done by the PHA, as well as from the drawings and specifications made a part of this contract. Any failure of the Contractor to take the actions described and acknowledged in this paragraph will not relieve the Contractor from responsibility for estimating properly the difficulty and cost of successfully performing the work, or for proceeding to successfully perform the work without additional expense to the PHA.

(b) The PHA assumes no responsibility for any conclusions or interpretations made by the Contractor based on the information made available by the PHA. Nor does the PHA assume responsibility for any understanding reached or representation made concerning conditions which can affect the work by any of its officers or agents before the execution of this contract, unless that understanding or representation is expressly stated in this contract.

8. Differing Site Conditions

(a) The Contractor shall promptly, and before the conditions are disturbed, give a written notice to the Contracting Officer of (1) subsurface or latent physical conditions at the site which differ materially from those indicated in this contract, or (2) unknown physical conditions at the site(s), of an unusual nature, which differ materially from those ordinarily encountered and generally recognized as inhering in work of the character provided for in the contract.

(b) The Contracting Officer shall investigate the site conditions promptly after receiving the notice. Work shall not proceed at the affected site, except at the Contractor's risk, until the Contracting Officer has provided written instructions to the Contractor. If the conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for, performing any part of the work under this contract, whether or not changed as a result of the conditions, the Contractor shall file a claim in writing to the PHA within ten days after receipt of such instructions and, in any event, before proceeding with the work. An equitable adjustment in the contract price, the delivery schedule, or both shall be made under this clause and the contract modified in writing accordingly.

(c) No request by the Contractor for an equitable adjustment to the contract under this clause shall be allowed, unless the Contractor has given the written notice required; provided, that the time prescribed in (a) above for giving written notice may be extended by the Contracting Officer.

(d) No request by the Contractor for an equitable adjustment to the contract for differing site conditions shall be allowed if made after final payment under this contract.

9. Specifications and Drawings for Construction

(a) The Contractor shall keep on the work site a copy of the drawings and specifications and shall at all times give the Contracting Officer access thereto. Anything mentioned in the specifications and not shown on the drawings, or shown on the drawings and not mentioned in the specifications, shall be of like effect as if shown or mentioned in both. In case of difference between drawings and specifications, the specifications shall govern. In case of discrepancy in the figures, in the drawings, or in the specifications, the matter shall be promptly submitted to the Contracting Officer, who shall promptly make a determination in writing. Any adjustment by the Contractor without such a determination shall be at its own risk and expense. The Contracting Officer shall furnish from time to time such detailed drawings and other information as considered necessary, unless otherwise provided.

(b) Wherever in the specifications or upon the drawings the words "directed", "required", "ordered", "designated", "prescribed", or words of like import are used, it shall be understood that the "direction", "requirement", "order", "designation", or "prescription", of the Contracting Officer is intended and similarly the words "approved", "acceptable", "satisfactory", or words of like import shall mean "approved by", or "acceptable to", or "satisfactory to" the Contracting Officer, unless otherwise expressly stated.

(c) Where "as shown" "as indicated", "as detailed", or words of similar import are used, it shall be understood that the reference is made to the drawings accompanying this contract unless stated otherwise. The word "provided" as used herein shall be understood to mean "provide complete in place" that is "furnished and installed".

(d) "Shop drawings" means drawings, submitted to the PHA by the Contractor, subcontractor, or any lower tier subcontractor, showing in detail (1) the proposed fabrication and assembly of structural elements and (2) the installation (i.e., form, fit, and attachment details) of materials of equipment. It includes drawings, diagrams, layouts, schematics, descriptive literature, illustrations, schedules, performance and test data, and similar materials furnished by the Contractor to explain in detail specific portions of the work required by the contract. The PHA may duplicate, use, and disclose in any manner and for any purpose shop drawings delivered under this contract.

(e) If this contract requires shop drawings, the Contractor shall coordinate all such drawings, and review them for accuracy, completeness, and compliance with other contract requirements and shall indicate its approval thereon as evidence of such coordination and review. Shop drawings submitted to the Contracting Officer without evidence of the Contractor's approval may be returned for resubmission. The Contracting Officer will indicate an approval or disapproval of the shop drawings and if not approved as submitted shall indicate the PHA's reasons therefore. Any work done before such approval shall be at the Contractor's risk. Approval by the Contracting Officer shall not relieve the Contractor from responsibility for any errors or omissions in such drawings, nor from responsibility for complying with the requirements of this contract, except with respect to variations described and approved in accordance with (f) below.

(f) If shop drawings show variations from the contract requirements, the Contractor shall describe such variations in writing, separate from the drawings, at the time of submission. If the Architect approves any such variation and the Contracting Officer concurs, the Contracting Officer shall issue an appropriate modification to the contract, except that, if the variation is minor or does not involve a change in price or in time of performance, a modification need not be issued.

(g) It shall be the responsibility of the Contractor to make timely requests of the PHA for such large scale and full size drawings, color schemes, and other additional information, not already in his possession, which shall be

required in the planning and production of the work. Such requests may be submitted as the need arises, but each such request shall be filed in ample time to permit appropriate action to be taken by all parties involved so as to avoid delay.

(h) The Contractor shall submit to the Contracting Officer for approval four copies (unless otherwise indicated) of all shop drawings as called for under the various headings of these specifications. Three sets (unless otherwise indicated) of all shop drawings, will be retained by the PHA and one set will be returned to the Contractor. As required by the Contracting Officer, the Contractor, upon completing the work under this contract, shall furnish a complete set of all shop drawings as finally approved. These drawings shall show all changes and revisions made up to the time the work is completed and accepted.

(i) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all shop drawings prepared by subcontractors are submitted to the Contracting Officer.

10. As-Built Drawings

(a) "As-built drawings," as used in this clause, means drawings submitted by the Contractor or subcontractor at any tier to show the construction of a particular structure or work as actually completed under the contract. "As-built drawings" shall be synonymous with "Record drawings."

(b) As required by the Contracting Officer, the Contractor shall provide the Contracting Officer accurate information to be used in the preparation of permanent as-built drawings. For this purpose, the Contractor shall record on one set of contract drawings all changes from the installations originally indicated, and record final locations of underground lines by depth from finish grade and by accurate horizontal offset distances to permanent surface improvements such as buildings, curbs, or edges of walks.

(c) This clause shall be included in all subcontracts at any tier. It shall be the responsibility of the Contractor to ensure that all as-built drawings prepared by subcontractors are submitted to the Contracting Officer.

11. Material and Workmanship

(a) All equipment, material, and articles furnished under this contract shall be new and of the most suitable grade for the purpose intended, unless otherwise specifically provided in this contract. References in the contract to equipment, material, articles, or patented processes by trade name, make, or catalog number, shall be regarded as establishing a standard of quality and shall not be construed as limiting competition. The Contractor may, at its option, use any equipment, material, article, or process that, in the judgment of, and as approved by the Contracting Officer, is equal to that named in the specifications, unless otherwise specifically provided in this contract.

(b) Approval of equipment and materials.

(1) The Contractor shall obtain the Contracting Officer's approval of the machinery and mechanical and other equipment to be incorporated into the work. When requesting approval, the Contractor shall furnish to the Contracting Officer the name of the manufacturer, the model number, and other information concerning the performance, capacity, nature, and rating of the machinery and mechanical and other equipment. When required by this contract or by the Contracting Officer, the Contractor shall also obtain the Contracting Officer's approval of the material or articles which the Contractor contemplates incorporating into the work. When requesting approval, the Contractor shall provide full information concerning the material or articles. Machinery, equipment, material, and articles that do not have the required approval shall be installed or used at the risk of subsequent rejection.

(2) When required by the specifications or the Contracting Officer, the Contractor shall submit appropriately marked samples (and certificates related to them) for approval at the Contractor's expense, with all shipping charges prepaid. The Contractor shall label, or otherwise properly mark on the container, the material or product represented, its place of origin, the name of the producer, the Contractor's name, and the identification of the construction project for which the material or product is intended to be used.

(3) Certificates shall be submitted in triplicate, describing each sample submitted for approval and certifying that the material, equipment or accessory complies with contract requirements. The certificates shall include the name and brand of the product, name of manufacturer, and the location where produced.

(4) Approval of a sample shall not constitute a waiver of the PHA right to demand full compliance with contract requirements. Materials, equipment and accessories may be rejected for cause even though samples have been approved.

(5) Wherever materials are required to comply with recognized standards or specifications, such specifications shall be accepted as establishing the technical qualities and testing methods, but shall not govern the number of tests required to be made nor modify other contract requirements. The Contracting Officer may require laboratory test reports on items submitted for approval or may approve materials on the basis of data submitted in certificates with samples. Check tests will be made on materials delivered for use only as frequently as the Contracting Officer determines necessary to insure compliance of materials with the specifications. The Contractor will assume all costs of retesting materials which fail to meet contract requirements and/or testing materials offered in substitution for those found deficient.

(6) After approval, samples will be kept in the Project office until completion of work. They may be built into the work after a substantial quantity of the materials they represent has been built in and accepted.

(c) Requirements concerning lead-based paint. The Contractor shall comply with the requirements concerning lead-based paint contained in the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. 4821-4846) as implemented by 24 CFR Part 35.

12. Permits and Codes

(a) The Contractor shall give all notices and comply with all applicable laws, ordinances, codes, rules and regulations. Notwithstanding the requirement of the Contractor to comply with the drawings and specifications in the contract, all work installed shall comply with all applicable codes and regulations as amended by any

waivers. Before installing the work, the Contractor shall examine the drawings and the specifications for compliance with applicable codes and regulations bearing on the work and shall immediately report any discrepancy it may discover to the Contracting Officer. Where the requirements of the drawings and specifications fail to comply with the applicable code or regulation, the Contracting Officer shall modify the contract by change order pursuant to the clause entitled Changes herein to conform to the code or regulation.

(b) The Contractor shall secure and pay for all permits, fees, and licenses necessary for the proper execution and completion of the work. Where the PHA can arrange for the issuance of all or part of these permits, fees and licenses, without cost to the Contractor, the contract amount shall be reduced accordingly.

13. Health, Safety, and Accident Prevention

(a) In performing this contract, the Contractor shall:

(1) Ensure that no laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his/her health and/or safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation;

(2) Protect the lives, health, and safety of other persons;

(3) Prevent damage to property, materials, supplies, and equipment; and,

(4) Avoid work interruptions.

(b) For these purposes, the Contractor shall:

(1) Comply with regulations and standards issued by the Secretary of Labor at 29 CFR Part 1926. Failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act (Public Law 91-54, 83 Stat. 96), 40 U.S.C. 3701 et seq.; and

(2) Include the terms of this clause in every subcontract so that such terms will be binding on each subcontractor.

(c) The Contractor shall maintain an accurate record of exposure data on all accidents incident to work performed under this contract resulting in death, traumatic injury, occupational disease, or damage to property, materials, supplies, or equipment, and shall report this data in the manner prescribed by 29 CFR Part 1904.

(d) The Contracting Officer shall notify the Contractor of any noncompliance with these requirements and of the corrective action required. This notice, when delivered to the Contractor or the Contractor's representative at the site of the work, shall be deemed sufficient notice of the noncompliance and corrective action required. After receiving the notice, the Contractor shall immediately take corrective action. If the Contractor fails or refuses to take corrective action promptly, the Contracting Officer may issue an order stopping all or part of the work until satisfactory corrective action has been taken. The Contractor shall not base any claim or request for equitable adjustment for additional time or money on any stop order issued under these circumstances.

(e) The Contractor shall be responsible for its subcontractors' compliance with the provisions of this clause. The Contractor shall take such action with respect to any subcontract as the PHA, the Secretary of Housing and Urban Development, or the Secretary of Labor shall direct as a means of enforcing such provisions.

14. Temporary Heating

The Contractor shall provide and pay for temporary heating, covering, and enclosures necessary to properly protect all work and materials against damage by dampness and cold, to dry out the work, and to facilitate the completion of the work. Any permanent heating equipment used shall be turned over to the PHA in the condition and at the time required by the specifications.

15. Availability and Use of Utility Services

(a) The PHA shall make all reasonably required amounts of utilities available to the Contractor from existing outlets and supplies, as specified in the contract. Unless otherwise provided in the contract, the amount of each utility service consumed shall be charged to or paid for by the Contractor at prevailing rates charged to the PHA or, where the utility is produced by the PHA, at reasonable rates determined by the Contracting Officer. The Contractor shall carefully conserve any utilities furnished without charge.

(b) The Contractor, at its expense and in a manner satisfactory to the Contracting Officer, shall install and maintain all necessary temporary connections and distribution lines, and all meters required to measure the amount of each utility used for the purpose of determining charges. Before final acceptance of the work by the PHA, the Contractor shall remove all the temporary connections, distribution lines, meters, and associated paraphernalia.

16. Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements

(a) The Contractor shall preserve and protect all structures, equipment, and vegetation (such as trees, shrubs, and grass) on or adjacent to the work site, which are not to be removed under this contract, and which do not unreasonably interfere with the work required under this contract.

(b) The Contractor shall only remove trees when specifically authorized to do so, and shall avoid damaging vegetation that will remain in place. If any limbs or branches of trees are broken during performance of this contract, or by the careless operation of equipment, or by workmen, the Contractor shall trim those limbs or branches with a clean cut and paint the cut with a tree-pruning compound as directed by the Contracting Officer.

(c) The Contractor shall protect from damage all existing improvements and utilities (1) at or near the work site and (2) on adjacent property of a third party, the locations of which are made known to or should be known by the Contractor. Prior to disturbing the ground at the construction site, the Contractor shall ensure that all underground utility lines are clearly marked.

(d) The Contractor shall shore up, brace, underpin, secure, and protect as necessary all foundations and other parts of existing structures adjacent to, adjoining, and in the vicinity of the site, which may be affected by the excavations or other operations connected with the construction of the project.

(e) Any equipment temporarily removed as a result of work under this contract shall be protected, cleaned, and replaced in the same condition as at the time of award of this contract.

(f) New work which connects to existing work shall correspond in all respects with that to which it connects and/or be similar to existing work unless otherwise required by the specifications.

(g) No structural members shall be altered or in any way weakened without the written authorization of the Contracting Officer, unless such work is clearly specified in the plans or specifications.

(h) If the removal of the existing work exposes discolored or unfinished surfaces, or work out of alignment, such surfaces shall be refinished, or the material replaced as necessary to make the continuous work uniform and harmonious. This, however, shall not be construed to require the refinishing or reconstruction of dissimilar finishes previously exposed, or finished surfaces in good condition, but in different planes or on different levels **Construction** when brought together by the removal of intervening work, unless such refinishing or reconstruction is specified in the plans or specifications.

(i) The Contractor shall give all required notices to any adjoining or adjacent property owner or other party before the commencement of any work.

(j) The Contractor shall indemnify and save harmless the PHA from any damages on account of settlement or the loss of lateral support of adjoining property, any damages from changes in topography affecting drainage, and from all loss or expense and all damages for which the PHA may become liable in consequence of such injury or damage to adjoining and adjacent structures and their premises.

(k) The Contractor shall repair any damage to vegetation, structures, equipment, utilities, or improvements, including those that are the property of a third party, resulting from failure to comply with the requirements of this contract or failure to exercise reasonable care in performing the work. If the Contractor fails or refuses to repair the damage promptly, the Contracting Officer may have the necessary work performed and charge the cost to the Contractor.

17. Temporary Buildings and Transportation of Materials

(a) Temporary buildings (e.g., storage sheds, shops, offices, sanitary facilities) and utilities may be erected by the Contractor only with the approval of the Contracting Officer and shall be built with labor and materials furnished by the Contractor without expense to the PHA. The temporary buildings and utilities shall remain the property of the Contractor and shall be removed by the Contractor at its expense upon completion of the work. With the written consent of the Contracting Officer, the buildings and utilities may be abandoned and need not be removed.

(b) The Contractor shall, as directed by the Contracting Officer, use only established roadways, or use temporary roadways constructed by the Contractor when and as authorized by the Contracting Officer. When materials are transported in prosecuting the work, vehicles shall not be loaded beyond the loading capacity recommended by the manufacturer of the vehicle or prescribed by any federal, state, or local law or regulation. When it is necessary to cross curbs or sidewalks, the Contractor shall protect them from damage. The Contractor shall repair or pay for the repair of any damaged curbs, sidewalks, or roads.

18. Clean Air and Water

The contactor shall comply with the Clean Air Act, as amended, 42 USC 7401 et seq., the Federal Water Pollution Control Water Act, as amended, 33 U.S.C. 1251 et seq., and standards issued pursuant thereto in the facilities in which this contract is to be performed.

19. Energy Efficiency

The Contractor shall comply with mandatory standards and policies relating to energy efficiency which are contained in the energy conservation plan issued in compliance with the Energy Policy and Conservation Act (Pub.L. 94-163) for the State in which the work under the contract is performed.

20. Inspection and Acceptance of

(a) Definitions. As used in this clause -
(1) “Acceptance” means the act of an authorized representative of the PHA by which the PHA approves and assumes ownership of the work performed under this contract. Acceptance may be partial or complete.
(2) “Inspection” means examining and testing the work performed under the contract (including, when appropriate, raw materials, equipment, components, and intermediate assemblies) to determine whether it conforms to contract requirements.
(3) “Testing” means that element of inspection that determines the properties or elements, including functional operation of materials, equipment, or their components, by the application of established scientific principles and procedures.

(b) The Contractor shall maintain an adequate inspection system and perform such inspections as will ensure that the work performed under the contract conforms to contract requirements. All work is subject to PHA inspection and test at all places and at all reasonable times before acceptance to ensure strict compliance with the terms of the contract.

(c) PHA inspections and tests are for the sole benefit of the PHA and do not: (1) relieve the Contractor of responsibility for providing adequate quality control measures; (2) relieve the Contractor of responsibility for loss or damage of the material before acceptance; (3) constitute or imply acceptance; or, (4) affect the continuing rights of the PHA after acceptance of the completed work under paragraph (j) below.

(d) The presence or absence of the PHA inspector does not relieve the Contractor from any contract requirement, nor is the inspector authorized to change any term or condition of the specifications without the Contracting Officer’s written authorization. All instructions and approvals with respect to the work shall be given to the Contractor by the Contracting Officer.

(e) The Contractor shall promptly furnish, without additional charge, all facilities, labor, and material reasonably needed for performing such safe and convenient inspections and tests as may be required by the Contracting Officer. The PHA may charge to the Contractor any additional cost of inspection or test when work is not ready at the time specified by the Contractor for inspection or test, or when prior rejection makes reinspection or retest necessary. The PHA shall perform all inspections and tests in a manner that will not unnecessarily delay the work. Special, full size, and performance tests shall be performed as described in the contract.

(f) The PHA may conduct routine inspections of the construction site on a daily basis.

(g) The Contractor shall, without charge, replace or correct work found by the PHA not to conform to contract requirements, unless the PHA decides that it is in its interest to accept the work with an appropriate adjustment in contract price. The Contractor shall promptly segregate and remove rejected material from the premises.

(h) If the Contractor does not promptly replace or correct rejected work, the PHA may (1) by contract or otherwise, replace or correct the work and charge the cost to the Contractor, or (2) terminate for default the Contractor's right to proceed.

(i) If any work requiring inspection is covered up without approval of the PHA, it must, if requested by the Contracting Officer, be uncovered at the expense of the Contractor. If at any time before final acceptance of the entire work, the **Construction** PHA considers it necessary or advisable, to examine work already completed by removing or tearing it out, the Contractor, shall on request, promptly furnish all necessary facilities, labor, and material. If such work is found to be defective or nonconforming in any material respect due to the fault of the Contractor or its subcontractors, the Contractor shall defray all the expenses of the examination and of satisfactory reconstruction. If, however, such work is found to meet the requirements of the contract, the Contracting Officer shall make an equitable adjustment to cover the cost of the examination and reconstruction, including, if completion of the work was thereby delayed, an extension of time.

(j) The Contractor shall notify the Contracting Officer, in writing, as to the date when in its opinion all or a designated portion of the work will be substantially completed and ready for inspection. If the Architect determines that the state of preparedness is as represented, the PHA will promptly arrange for the inspection. Unless otherwise specified in the contract, the PHA shall accept, as soon as practicable after completion and inspection, all work required by the contract or that portion of the work the Contracting Officer determines and designates can be accepted separately. Acceptance shall be final and conclusive except for latent defects, fraud, gross mistakes amounting to fraud, or the PHA's right under any warranty or guarantee.

21. Use and Possession Prior to Completion

(a) The PHA shall have the right to take possession of or use any completed or partially completed part of the work. Before taking possession of or using any work, the Contracting Officer shall furnish the Contractor a list of items of work remaining to be performed or corrected on those portions of the work that the PHA intends to take possession of or use. However, failure of the Contracting Officer to list any item of work shall not relieve the Contractor of responsibility for complying with the terms of the contract. The PHA's possession or use shall not be deemed an acceptance of any work under the contract.

(b) While the PHA has such possession or use, the Contractor shall be relieved of the responsibility for (1) the loss of or damage to the work resulting from the PHA's possession or use, notwithstanding the terms of the clause entitled Permits and Codes herein; (2) all maintenance costs on the areas occupied; and, (3) furnishing heat, light, power, and water used in the areas occupied without proper remuneration therefore. If prior possession or use by the PHA delays the progress of the work or causes additional expense to the Contractor, an equitable adjustment shall be made in the contract price or the time of completion, and the contract shall be modified in writing accordingly.

22. Warranty of Title

The Contractor warrants good title to all materials, supplies, and equipment incorporated in the work and agrees to deliver the premises together with all improvements thereon free from any claims, liens or charges, and agrees further that neither it nor any other person, firm or corporation shall have any right to a lien upon the premises or anything appurtenant thereto.

23. Warranty of

(a) In addition to any other warranties in this contract, the Contractor warrants, except as provided in paragraph (j) of this clause, that work performed under this contract conforms to the contract requirements and is free of any defect in equipment, material, or workmanship performed by the Contractor or any subcontractor or supplier at any tier. This warranty shall continue for a period of _____ (one year unless otherwise indicated) from the date of final acceptance of the work. If the PHA takes possession of any part of the work before final acceptance, this warranty shall continue for a period of (one year unless otherwise indicated) from the date that the PHA takes possession.

(b) The Contractor shall remedy, at the Contractor's expense, any failure to conform, or any defect. In addition, the Contractor shall remedy, at the Contractor's expense, any damage to PHA-owned or controlled real or personal property when the damage is the result of—

(1) The Contractor's failure to conform to contract requirements; or

(2) Any defects of equipment, material, workmanship or design furnished by the Contractor.

(c) The Contractor shall restore any work damaged in fulfilling the terms and conditions of this clause. The Contractor's warranty with respect to work repaired or replaced will run for (one year unless otherwise indicated) from the date of repair or replacement.

(d) The Contracting Officer shall notify the Contractor, in writing, within a reasonable time after the discovery of any failure, defect or damage.

(e) If the Contractor fails to remedy any failure, defect, or damage within a reasonable time after receipt of notice, the PHA shall have the right to replace, repair or otherwise remedy the failure, defect, or damage at the Contractor's expense.

(f) With respect to all warranties, express or implied, from subcontractors, manufacturers, or suppliers for work performed and materials furnished under this contract, the Contractor shall:

(1) Obtain all warranties that would be given in normal commercial practice;

(2) Require all warranties to be executed in writing, for the benefit of the PHA; and,

(3) Enforce all warranties for the benefit of the PHA.

(g) In the event the Contractor's warranty under paragraph (a) of this clause has expired, the PHA may bring suit at its own expense to enforce a subcontractor's, manufacturer's or supplier's warranty.

(h) Unless a defect is caused by the negligence of the Contractor or subcontractor or supplier at any tier, the Contractor shall not be liable for the repair of any defect of material or design furnished by the PHA nor for the repair of any damage that results from any defect in PHA furnished material or design.

(i) Notwithstanding any provisions herein to the contrary, the establishment of the time periods in paragraphs (a) and (c) above relate only to the specific obligation of the Contractor to correct the work, and have no relationship to the time within which its obligation to comply with the contract may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to its obligation other than specifically to correct the work.

(j) This warranty shall not limit the PHA's rights under the Inspection and Acceptance of Construction clause of this contract with respect to latent defects, gross mistakes or fraud.

24. Prohibition Against Liens

The Contractor is prohibited from placing a lien on the PHA's property. This prohibition shall apply to all subcontractors at any tier and all materials suppliers.

Administrative Requirements

25. Contract Period

The Contractor shall complete all work required under this contract within 700 calendardays of the effective date of the contract, or within the time schedule establishedin the notice to proceedissuedby the ContractingOfficer.

26. Order of Provisions

accordance with the terms and conditions of the

In the event of a conflict between these General Conditions and the Specifications, the General Conditions shall prevail. In the event of a conflict between the contract and any applicable state or local law or regulation, the state or local law or regulation shall prevail; provided that such state or local law or regulation does not conflict with, or is less restrictive than applicable federal law, regulation, or Executive Order. In the event of such a conflict, applicable federal law, regulation, and Executive Order shall prevail.

27. Payments

retain ten (10) percent of the amount of progress

(a) The PHA shall pay the Contractor the price as provided in this contract.

(b) The PHA shall make progress payments approximately every 30 days as the work proceeds, on estimates of work accomplished which meets the standards of quality established under the contract, as approved by the Contracting Officer. The PHA may, subject to written determination and approval of the Contracting Officer, make more frequent payments to contractors which are qualified small businesses.

(c) Before the first progress payment under this contract, the Contractor shall furnish, in such detail as requested by the Contracting Officer, a breakdown of the total contract price showing the amount included therein for each principal category of the work, which shall substantiate the payment amount requested in order to provide a basis for determining progress payments. The breakdown shall be approved by the Contracting Officer and must be acceptable to HUD. If the contract covers more than one project, the Contractor shall furnish a separate breakdown for each. The values and quantities employed in making up this breakdown are for determining the amount of progress payments and shall not be construed as a basis for additions to or deductions from the contract price. The Contractor shall prorate its overhead and profit over the construction period of the contract.

(d) The Contractor shall submit, on forms provided by the

performed during each period based upon the approved

submitted not later than _7_____ days in advance of the date set for payment and are subject to correction and revision as required. The estimates must be approved by the Contracting Officer with the concurrence of the Architect prior to payment. If the contract covers more than one project, the Contractor shall furnish a separate progress payment estimate for each.

(e) Along with each request for progress payments and the required estimates, the Contractor shall furnish the following certification, or payment shall not be made: I hereby certify, to the best of my knowledge and belief, that:

(1) The amounts requested are only for performance in accordance with the specifications, terms, and conditions of the contract;

(2) Payments to subcontractors and suppliers have been made from previous payments received under the contract, and timely payments will be made from the proceeds of the payment covered by this certification, in accordance with subcontract agreements; and,

(3) This request for progress payments does not include any amounts which the prime contractor intends to withhold or retain from a subcontractor or supplier in

subcontract.

Name:

Title:

Date:

(f) Except as otherwise provided in State law, the PHA shall

payments until completion and acceptance of all work under the contract; except, that if upon completion of 50 percent of the work, the Contracting Officer, after consulting with the Architect, determines that the Contractor's performance and progress are satisfactory, the PHA may make the remaining payments in full for the work subsequently completed. If the Contracting Officer subsequently determines that the Contractor's performance and progress are unsatisfactory, the PHA shall reinstate the ten (10) percent (or other percentage as provided in State law) retainage until such time as the Contracting Officer determines that performance and progress are satisfactory.

(g) The Contracting Officer may authorize material delivered on the site and preparatory work done to be taken into consideration when computing progress payments.

Material delivered to the Contractor at locations other than the site may also be taken into consideration if the Contractor furnishes satisfactory evidence that (1) it has acquired title to such material; (2) the material is properly stored in a bonded warehouse, storage yard, or similar suitable place as may be approved by the Contracting Officer; (3) the material is insured to cover its full value; and (4) the material will be used to perform this contract. Before any progress payment which includes delivered material is made, the Contractor shall furnish such documentation as the Contracting Officer may require to assure the protection of the PHA's interest in such materials. The Contractor shall remain responsible for such stored material notwithstanding the transfer of title to the PHA.

(h) All material and work covered by progress payments made shall, at the time of payment become the sole property of the PHA, but this shall not be construed as (1) relieving the Contractor from the sole responsibility for all material and work upon which payments have been made or the restoration of any damaged work; or, (2) waiving the right of the PHA to require the fulfillment of all of the terms of the contract. In the event the work of the Contractor has been damaged by other contractors or persons other than employees of the PHA in the course of their employment, the Contractor shall restore such damaged work without cost to the PHA and to seek redress for its damage only from those who directly caused it.

(i) The PHA shall make the final payment due the Contractor under this contract after (1) completion and final acceptance of all work; and (2) presentation of release of all claims against the PHA arising by virtue of this contract, other than claims, in stated amounts, that the Contractor has specifically excepted from the operation of the release. Each such exception shall embrace no more than one claim, the basis and scope of which shall be clearly defined. The amounts for such excepted claims shall not be included in the request for final payment. A release may also be required of the assignee if the Contractor's claim to amounts payable under this contract has been assigned.

(j) Prior to making any payment, the Contracting Officer may require the Contractor to furnish receipts or other evidence of payment from all persons performing work and supplying material to the Contractor, if the Contracting Officer determines such evidence is necessary to substantiate claimed costs.

(k) The PHA shall not; (1) determine or adjust any claims for payment or disputes arising there under between the Contractor and its subcontractors or material suppliers; or, (2) withhold any moneys for the protection of the subcontractors or material suppliers. The failure or refusal of the PHA to withhold moneys from the Contractor shall in nowise impair the obligations of any surety or sureties under any bonds furnished under this contract.

28. Contract Modifications

(a) Only the Contracting Officer has authority to modify any term or condition of this contract. Any contract modification shall be authorized in writing.

(b) The Contracting Officer may modify the contract unilaterally (1) pursuant to a specific authorization stated in a contract clause (e.g., Changes); or (2) for administrative matters which do not change the rights or responsibilities of the parties (e.g., change in the PHA address). All other contract modifications shall be in the form of supplemental agreements signed by the Contractor and the Contracting Officer.

(c) When a proposed modification requires the approval of HUD prior to its issuance (e.g., a change order that exceeds the PHA's approved threshold), such modification shall not be effective until the required approval is received by the PHA.

29. Changes

(a) The Contracting Officer may, at any time, without notice to the sureties, by written order designated or indicated to be a change order, make changes in the work within the general scope of the contract including changes:
(1) In the specifications (including drawings and designs);
(2) In the method or manner of performance of the work;
(3) PHA-furnished facilities, equipment, materials, services, or site; or,
(4) Directing the acceleration in the performance of the work.

(b) Any other written order or oral order (which, as used in this paragraph (b), includes direction, instruction, interpretation, or determination) from the Contracting Officer that causes a change shall be treated as a change order under this clause; provided, that the Contractor gives the Contracting Officer written notice stating (1) the date, circumstances and source of the order and (2) that the Contractor regards the order as a change order.

(c) Except as provided in this clause, no order, statement or conduct of the Contracting Officer shall be treated as a change under this clause or entitle the Contractor to an equitable adjustment.

(d) If any change under this clause causes an increase or decrease in the Contractor's cost of, or the time required for the performance of any part of the work under this contract, whether or not changed by any such order, the Contracting Officer shall make an equitable adjustment and modify the contract in writing. However, except for a adjustment based on defective specifications, no proposal for any change under paragraph (b) above shall be allowed for any costs incurred more than 20 days (5 days for oral orders) before the Contractor gives written notice as required. In the case of defective specifications for which the PHA is responsible, the equitable adjustment shall include any increased cost reasonably incurred by the Contractor in attempting to comply with the defective specifications.

(e) The Contractor must assert its right to an adjustment under this clause within 30 days after (1) receipt of a written change order under paragraph (a) of this clause, or (2) the furnishing of a written notice under paragraph (b) of this clause, by submitting a written statement describing the general nature and the amount of the proposal. If the facts justify it, the Contracting Officer may extend the period for submission. The proposal may be included in the notice required under paragraph (b) above. No proposal by the Contractor for an equitable adjustment shall be allowed if asserted after final payment under this contract.

(f) The Contractor's written proposal for equitable adjustment shall be submitted in the form of a lump sum proposal supported with an itemized breakdown of all increases and decreases in the contract in at least the following details:

(1) Direct Costs. Materials (list individual items, the quantity and unit cost of each, and the aggregate cost); Transportation and delivery costs associated with materials; Labor breakdowns by hours or unit costs (identified with specific work to be performed); Construction equipment exclusively necessary for the change; Costs of preparation and/ or revision to shop drawings resulting from the change; Worker's Compensation and Public Liability Insurance; Employment taxes under FICA and FUTA; and, Bond Costs when size of change warrants revision.

(2) Indirect Costs. Indirect costs may include overhead, general and administrative expenses, and fringe benefits not normally treated as direct costs.

(3) Profit. The amount of profit shall be negotiated and may vary according to the nature, extent, and complexity of the work required by the change. The allowability of the direct and indirect costs shall be determined in accordance with the Contract Cost Principles and Procedures for Commercial Firms in Part 31 of the Federal Acquisition Regulation (48 CFR 1-31), as implemented by HUD Handbook 2210.18, in effect on the date of this contract. The Contractor shall not be allowed a profit on the profit received by any subcontractor. Equitable adjustments for deleted work shall include a credit for profit and may include a credit for indirect costs. On proposals covering both increases and decreases in the amount of the contract, the application of indirect costs and profit shall be on the net-change in direct costs for the Contractor or subcontractor performing the work.

(g) The Contractor shall include in the proposal its request for time extension (if any), and shall include sufficient information and dates to demonstrate whether and to what extent the change will delay the completion of the contract in its entirety.

(h) The Contracting Officer shall act on proposals within 30 days after their receipt, or notify the Contractor of the date when such action will be taken.

(i) Failure to reach an agreement on any proposal shall be a dispute under the clause entitled Disputes herein. Nothing in this clause, however, shall excuse the Contractor from proceeding with the contract as changed.

(j) Except in an emergency endangering life or property, no change shall be made by the Contractor without a prior order from the Contracting Officer.

30. Suspension of Work

(a) The Contracting Officer may order the Contractor in writing to suspend, delay, or interrupt all or any part of the work of this contract for the period of time that the Contracting Officer determines appropriate for the convenience of the PHA.

(b) If the performance of all or any part of the work is, for an unreasonable period of time, suspended, delayed, or interrupted (1) by an act of the Contracting Officer in the administration of this contract, or (2) by the Contracting Officer's failure to act within the time specified (or within a reasonable time if not specified) in this contract an adjustment shall be made for any increase in the cost of performance of the contract (excluding profit) necessarily caused by such unreasonable suspension, delay, or interruption and the contract modified in writing accordingly. However, no adjustment shall be made under this clause for any suspension, delay, or interruption to the extent that performance would have been so suspended, delayed, or interrupted by any other cause, including the fault or negligence of the Contractor or for which any equitable adjustment is provided for or excluded under any other provision of this contract.

(c) A claim under this clause shall not be allowed (1) for any costs incurred more than 20 days before the Contractor shall have notified the Contracting Officer in writing of the act or failure to act involved (but this requirement shall not apply as to a claim resulting from a suspension order); and, (2) unless the claim, in an amount stated, is asserted in writing as soon as practicable after the termination of the suspension, delay, or interruption, but not later than the date of final payment under the contract.

31. Disputes

(a) "Claim," as used in this clause, means a written demand or written assertion by one of the contracting parties seeking, as a matter of right, the payment of money in a sum certain, the adjustment or interpretation of contract terms, or other relief arising under or relating to the contract. A claim arising under the contract, unlike a claim relating to the contract, is a claim that can be resolved under a contract clause that provides for the relief sought by the claimant. A voucher, invoice, or other routine request for payment that is not in dispute when submitted is not a claim. The submission may be converted to a claim by complying with the requirements of this clause, if it is disputed either as to liability or amount or is not acted upon in a reasonable time.

(b) Except for disputes arising under the clauses entitled Labor Standards - Davis Bacon and Related Acts, herein, all disputes arising under or relating to this contract, including any claims for damages for the alleged breach thereof which are not disposed of by agreement, shall be resolved under this clause.

(c) All claims by the Contractor shall be made in writing and submitted to the Contracting Officer for a written decision. A claim by the PHA against the Contractor shall be subject to a written decision by the Contracting Officer.

(d) The Contracting Officer shall, within 60 (unless otherwise indicated) days after receipt of the request, decide the claim or notify the Contractor of the date by which the decision will be made.

(e) The Contracting Officer's decision shall be final unless the Contractor (1) appeals in writing to a higher level in the PHA in accordance with the PHA's policy and procedures, (2) refers the appeal to an independent mediator or arbitrator, or (3) files suit in a court of competent jurisdiction. Such appeal must be made within (30 unless otherwise indicated) days after receipt of the Contracting Officer's decision.

(f) The Contractor shall proceed diligently with performance of this contract, pending final resolution of any request for relief, claim, appeal, or action arising under or relating to the contract, and comply with any decision of the Contracting Officer.

32. Default

(a) If the Contractor refuses or fails to prosecute the work, or any separable part thereof, with the diligence that will insure its completion within the time specified in this contract, or any extension thereof, or fails to complete said work within this time, the Contracting Officer may, by written notice to the Contractor, terminate the right to

proceed with the work (or separable part of the work) that has been delayed. In this event, the PHA may take over the work and complete it, by contract or otherwise, and may take possession of and use any materials, equipment, and plant on the work site necessary for completing the work. The Contractor and its sureties shall be liable for any damage to the PHA resulting from the Contractor's refusal or failure to complete the work within the specified time, whether or not the Contractor's right to proceed with the work is terminated. This liability includes any increased costs incurred by the PHA in completing the work.

Convenience

(b) The Contractor's right to proceed shall not be terminated or the Contractor charged with damages under this clause if—

(1) The delay in completing the work arises from unforeseeable causes beyond the control and without the fault or negligence of the Contractor. Examples of such causes include (i) acts of God, or of the public enemy, (ii) acts of the PHA or other governmental entity in either its sovereign or contractual capacity, (iii) acts of another contractor in the performance of a contract with the PHA, (iv) fires, (v) floods, (vi) epidemics, (vii) quarantine restrictions, (viii) strikes, (ix) freight embargoes, (x) unusually severe weather, or (xi) delays of subcontractors or suppliers at any tier arising from unforeseeable causes beyond the control and without the fault or negligence of both the Contractor and the subcontractors or suppliers; and

(2) The Contractor, within days (10 days unless otherwise indicated) from the beginning of such delay (unless extended by the Contracting Officer) notifies the Contracting Officer in writing of the causes of delay. The Contracting Officer shall ascertain the facts and the extent of the delay. If, in the judgment of the Contracting Officer, the findings of fact warrant such action, time for completing the work shall be extended by written modification to the contract. The findings of the Contracting Officer shall be reduced to a written decision which shall be subject to the provisions of the Disputes clause of this contract.

(c) If, after termination of the Contractor's right to proceed, it is determined that the Contractor was not in default, or that the delay was excusable, the rights and obligations of the parties will be the same as if the termination had been for convenience of the PHA.

33. Liquidated Damages

(a) If the Contractor fails to complete the work within the time specified in the contract, or any extension, as specified in the clause entitled Default of this contract, the Contractor shall pay to the PHA as liquidated damages, the sum of$ 200.00 for each day of delay. If different completion dates are specified in the contract for separate parts or stages of the work, the amount of liquidated damages shall be assessed on those parts or stages which are delayed. To the extent that the Contractor's delay or nonperformance is excused under another clause in this contract, liquidated damages shall not be due the PHA. The Contractor remains liable for damages caused other than by delay.

(b) If the PHA terminates the Contractor's right to proceed, the resulting damage will consist of liquidated damages until such reasonable time as may be required for final completion of the work together with any increased costs occasioned the PHA in completing the work.

(c) If the PHA does not terminate the Contractor's right to proceed, the resulting damage will consist of liquidated damages until the work is completed or accepted.

34. Termination for Convenience

(a) The Contracting Officer may terminate this contract in whole, or in part, whenever the Contracting Officer determines that such termination is in the best interest of the PHA. Any such termination shall be effected by delivery to the Contractor of a Notice of Termination specifying the extent to which the performance of the work under the contract is terminated, and the date upon which such termination becomes effective.

(b) If the performance of the work is terminated, either in whole or in part, the PHA shall be liable to the Contractor for reasonable and proper costs resulting from such termination upon the receipt by the PHA of a properly presented claim setting out in detail: (1) the total cost of the work performed to date of termination less the total amount of contract payments made to the Contractor; (2) the cost (including reasonable profit) of settling and paying claims under subcontracts and material orders for work performed and materials and supplies delivered to the site, payment for which has not been made by the PHA to the Contractor or by the Contractor to the subcontractor or supplier; (3) the cost of preserving and protecting the work already performed until the PHA or assignee takes possession thereof or assumes responsibility therefore; (4) the actual or estimated cost of legal and accounting services reasonably necessary to prepare and present the termination claim to the PHA; and (5) an amount constituting a reasonable profit on the value of the work performed by the Contractor.

(c) The Contracting Officer will act on the Contractor's claim within days (60 days unless otherwise indicated) of receipt of the Contractor's claim.

(d) Any disputes with regard to this clause are expressly made subject to the provisions of the Disputes clause of this contract.

35. Assignment of Contract

The Contractor shall not assign or transfer any interest in this contract; except that claims for monies due or to become due from the PHA under the contract may be assigned to a bank, trust company, or other financial institution. Such assignments of claims shall only be made with the written concurrence of the Contracting Officer. If the Contractor is a partnership, this contract shall inure to the benefit of the surviving or remaining member(s) of such partnership as approved by the Contracting Officer.

36. Insurance

(a) Before commencing work, the Contractor and each subcontractor shall furnish the PHA with certificates of insurance showing the following insurance is in force and will insure all operations under the Contract:

(1) Workers' Compensation, in accordance with state or Territorial Workers' Compensation laws.

(2) Commercial General Liability with a combined single limit for bodily injury and property damage of not less than $ 500,000

per occurrence to protect the Contractor and each subcontractor against claims for bodily injury or death and damage to the property of others. This shall cover the use of all equipment, hoists, and vehicles on the site(s) not covered by Automobile Liability under (3) below. If the Contractor has a "claims made" policy, then the following additional requirements apply: the policy must provide a "retroactive date" which must be on or before the execution date of the Contract; and the extended reporting period may not be less than five years following the completion date of the Contract.

(3) Automobile Liability on owned and non -owned motor vehicles used on the site(s) or in connection therewith for a combined single limit for bodily injury and property damage of not less than $ 500,000 Contractor. [Contracting Officer insert amount] per occurrence.

(b) Before commencing work, the Contractor shall furnish the PHA with a certificate of insurance evidencing that Builder's Risk (fire and extended coverage) Insurance on all work in place and/or materials stored at the building site(s), including foundations and building equipment, is in force. The Builder's Risk Insurance shall be for the benefit of the Contractor and the PHA as their interests may appear and each shall be named in the policy or policies as an insured. The Contractor in installing equipment supplied by the PHA shall carry insurance on such equipment from the time the Contractor takes possession thereof until the Contract work is accepted by the PHA. The Builder's Risk Insurance need not be carried on excavations, piers, footings, or foundations until such time as work on the superstructure is started. It need not be carried on landscape work. Policies shall furnish coverage at all times for the full cash value of all completed construction, as well as materials in place and/or stored at the site(s), whether or not partial payment has been made by the PHA. The Contractor may terminate this insurance on buildings as of the date taken over for occupancy by the PHA. The Contractor is not required to carry Builder's Risk Insurance for modernization work which does not involve structural alterations or additions and where the PHA's existing fire and extended coverage policy can be endorsed to include such work.

(c) All insurance shall be carried with companies which are financially responsible and admitted to do business in the State in which the project is located. If any such insurance is due to expire during the construction period, the Contractor (including subcontractors, as applicable) shall not permit the coverage to lapse and shall furnish evidence of coverage to the Contracting Officer. All certificates of insurance, as evidence of coverage, shall provide that no coverage may be canceled or non-renewed by the insurance company until at least 30 days prior written notice has been given to the Contracting Officer.

37. Subcontracts

(a) Definitions. As used in this contract -

(1) "Subcontract" means any contract, purchase order, or other purchase agreement, including modifications and change orders to the foregoing, entered into by a subcontractor to furnish supplies, materials, equipment, and services for the performance of the prime contract or a subcontract.

(2) "Subcontractor" means any supplier, vendor, or firm that furnishes supplies, materials, equipment, or services to or for the Contractor or another subcontractor.

(b) The Contractor shall not enter into any subcontract with any subcontractor who has been temporarily denied participation in a HUD program or who has been suspended or debarred from participating in contracting programs by any agency of the United States Government or of the state in which the work under this contract is to be performed.

(c) The Contractor shall be as fully responsible for the acts or omissions of its subcontractors, and of persons either directly or indirectly employed by them as for the acts or omissions of persons directly employed by the

(d) The Contractor shall insert appropriate clauses in all subcontracts to bind subcontractors to the terms and conditions of this contract insofar as they are applicable to the work of subcontractors.

(e) Nothing contained in this contract shall create any contractual relationship between any subcontractor and the PHA or between the subcontractor and HUD.

38. Subcontracting with Small and Minority Firms, Women's Business Enterprise, and Labor Surplus Area Firms

The Contractor shall take the following steps to ensure that, whenever possible, subcontracts are awarded to small business firms, minority firms, women's business enterprises, and labor surplus area firms:

(a) Placing qualified small and minority businesses and women's business enterprises on solicitation lists;

(b) Ensuring that small and minority businesses and women's business enterprises are solicited whenever they are potential sources;

(c) Dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by small and minority businesses and women's business enterprises;

(d) Establishing delivery schedules, where the requirements of the contract permit, which encourage participation by small and minority businesses and women's business enterprises; and

(e) Using the services and assistance of the U.S. Small Business Administration, the Minority Business Development Agency of the U.S. Department of Commerce, and State and local governmental small business agencies.

39. Equal Employment Opportunity

During the performance of this contract, the Contractor/ Seller agrees as follows:

(a) The Contractor/Seller shall not discriminate against any employee or applicant for employment because of of race color, religion, sex, sexual orientation, gender identity, disability, or national origin.

(b) The Contractor/Seller shall take affirmative action to ensure that applicants are employed, and that employees are treated during employment without regard to their race, color, religion, sex, sexual orientation, gender identity, disability, or national origin. Such action shall include, but not be limited to, (1) employment, (2) upgrading demotion, (4) transfer, (5) recruitment or recruitment advertising, (6) layoff or termination, (7) rates of pay or other forms of compensation, and (8) selection for training,including apprenticeship

(c) The Contractor/Seller agrees to post in conspicuous places available to employees and applicants for employment the notices to be provided by the Contracting Officer setting forth the provisions of this nondiscrimination clause.
(d) The Contractor/Seller shall, in all solicitations or advertisements for employees placed by or on behalf of the Contractor/Seller, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, or national origin.
(e) The Contractor/Seller shall send, to each labor union or representative of workers with which it has a collective bargaining agreement or other contract or understanding, the notice to be provided by the Contracting Officer advising the labor union or workers' representative of the Contractor's commitments under this clause, and post copies of the notice in conspicuous places available to employees and applicants for employment.
(f) The Contractor/Seller shall comply with Executive Order 11246, as amended, and the rules, regulations, and orders of the Secretary of Labor.
(g) The Contractor/Seller shall furnish all information and reports required by Executive Order 11246, as amended, Section 503 of the Rehabilitation Act of 1973, as amended, and by rules, regulations, and orders of the Secretary of Labor, or pursuant thereto. The Contractor/Seller shall permit

access to its books, records, and accounts by the Secretary of Labor for purposes of investigation to ascertain compliance with such rules, regulations, and orders.

(h) In the event of a that the Contractor/Seller is in noncompliance with the nondiscrimination clauses of this contract or with any of such rules, regulations, or orders, this contract may be canceled, terminated or suspended in whole or in part and the contractor/seller may be declared ineligible for further Government contracts in accordance with procedures authorized in Executive Order 11246 of September 24, 1965, and such other sanctions may be imposed and remedies invoked as provided in Executive Order 11246 of September 24, 1965, or by rule, regulation, or order of the Secretary of Labor, or as otherwise provided by law.

(i)The contractor/seller will include the provisions of paragraphs (a) through (h) in every subcontract or purchase order unless exempted by rules, regulations, or orders of the Secretary of Labor issued pursuant to section 204 of Executive Order 11246 of September 24, 1965, so that such provisions will be binding upon each sub[contractor/seller] or vendor. The [contractor/seller] will take such action with respect to any subcontract or purchase order as may be directed by the Secretary of Labor as a means of enforcing such provisions in cluding sanctions for noncompliance: Provided, however, that in the event the [contractor/seller] becomes involved in, or is threatened with, litigation with a subcontractor or vendor as a result of such direction, the [contractor/seller] may request the United States to enter into such litigation to protect the interests of the United States.

(j) Compliance with the requirements of this clause shall be to the maximum extent consistent with, but not in derogation of, compliance with section 7(b) of the Indian Self-Determination and Education Assistance Act and the Indian Preference clause of this contract.

40. Employment, Training, and Contracting Opportunities for Low-Income Persons, Section 3 of the Housing and Urban Development Act of 1968.

(a) The work to be performed under this contract is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by Section 3, shall, to the greatest extent feasible, be directed to low- and very low-income persons, particularly persons who are recipients of HUD assistance for housing.
(b) The parties to this contract agree to comply with HUD's regulations in 24 CFR Part 75, which implement Section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the Part 75 regulations.
(c) The contractor agrees to send to each labor organization or representative of workers with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause and will post copies of the notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the Section 3 prioritization requirements and shall state the minimum percentages of labor hour requirements established in the Benchmark Notice (FR-6085-N-04).
(d) The contractor agrees to include this section 3 clause in every subcontract subject to compliance with regulations in 24 CFR Part 75, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulations in 24 CFR Part 75. The contractor will not subcontract with any subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations in 24 CFR Part 75.
(e) Noncompliance with HUD's regulations in 24 CFR Part 75 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
(f) Contracts, subcontracts, grants, or subgrants subject to Section 7(b) of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 5307(b)) or subject to tribal preference requirements as authorized under 101(k) of the Native American Housing Assistance and Self-Determination Act (25 U.S.C. 4111(k)) must provide preferences in employment, training, and business opportunities to Indians and Indian organizations, and are therefore not subject to the requirements of 24 CFR Part 75.

41. Interest of Members of Congress

No member of or delegate to the Congress of the United States of America shall be admitted to any share or part of this contract or to any benefit that may arise therefrom.

42. Interest of Members, Officers, or Employees and Former Members, Officers, or Employees

No member, officer, or employee of the PHA, no member of the governing body of the locality in which the project is situated, no member of the governing body of the locality in which the PHA was activated, and no other public official of such locality or localities who exercises any functions or responsibilities with respect to the project, shall, during his or her tenure, or for one year thereafter, have any interest, direct or indirect, in this contract or the proceeds thereof.

43. Limitations on Payments made to Influence Certain Federal Financial Transactions

(a) The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of **Acts** Federal appropriated funds to pay any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, and officer or employee of Congress, or an employee of a Member of Congress in connection with any of the following covered Federal actions: the awarding of any Federal contract; the making of any Federal grant; the making of any Federal loan; the entering into of any cooperative agreement; or the modification of any Federal contract, grant, loan, or cooperative agreement.

(b) The Contractor further agrees to comply with the requirement of the Act to furnish a disclosure (OMB Standard Form LLL, Disclosure of Lobbying Activities) if any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress in connection with a Federal contract, grant, loan, or cooperative agreement.

44. Royalties and Patents

The Contractor shall pay all royalties and license fees. It shall defend all suits or claims for infringement of any patent rights and shall save the PHA harmless from loss on account thereof; except that the PHA shall be responsible for all such loss when a particular design, process or the product of a particular manufacturer or manufacturers is specified and the Contractor has no reason to believe that the specified design, process, or product is an infringement. If, however, the Contractor has reason to believe that any design, process or product specified is an infringement of a patent, the Contractor shall promptly notify the Contracting Officer. Failure to give such notice shall make the Contractor responsible for resultant loss.

45. Examination and Retention of Contractor's Records

(a) The PHA, HUD, or Comptroller General of the United States, or any of their duly authorized representatives shall, until 3 years after final payment under this contract, have access to and the right to examine any of the Contractor's directly pertinent books, documents, papers, or other records involving transactions related to this contract for the purpose of making audit, examination, excerpts, and transcriptions.

(b) The Contractor agrees to include in first-tier subcontracts under this contract a clause substantially the same as paragraph (a) above. "Subcontract," as used in this clause, excludes purchase orders not exceeding $10,000.

(c) The periods of access and examination in paragraphs (a) and (b) above for records relating to (1) appeals under the Disputes clause of this contract, (2) litigation or settlement of claims arising from the performance of this contract, or (3) costs and expenses of this contract to which the PHA, HUD, or Comptroller General or any of their duly authorized representatives has taken exception shall continue until disposition of such appeals, litigation, claims, or exceptions.

46. Labor Standards - Davis-Bacon and Related

If the total amount of this contract exceeds $2,000, the Federal labor standards set forth in the clause below shall apply to the development or construction work to be performed under the contract.

(a) Minimum Wages.

(1) All laborers and mechanics employed under this contract in the development or construction of the project(s) involved will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the Contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the regular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits in the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein; provided, that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall

be posted at all times by the Contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

(2) (i) Any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when all the following criteria have been met: (A) The work to be performed by the classification requested is not performed by a classification in the wage determination; and (B) The classification is utilized in the area by the construction industry; and (C) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(ii) If the Contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employee Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.

(iii) In the event the Contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator of the Wage and Hour Division for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary.

(iv) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (a)(2)(ii) or (iii) of this clause shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in classification.

(3) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the Contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(4) If the Contractor does not make payments to a trustee or other third person, the Contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program; provided, that the Secretary of Labor has found, upon the written request of the Contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the Contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(b) Withholding of funds. HUD or its designee shall, upon its own action or upon written request of an authorized representative of the Department of Labor, withhold or cause to be withheld from the Contractor under this contract or any other Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime Contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the Contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working in the construction or development of the project, all or part of the wages required by the contract, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the Contractor, disburse such amounts withheld for and on account of the Contractor or subcontractor to the respective employees to whom they are due.

(c) Payrolls and basic records.

(1) Payrolls and basic records relating thereto shall be maintained by the Contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working in the construction or development of the project. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made, and actual wages paid. Whenever the Secretary of Labor has found, under 29 CFR 5.5(a)(1)(iv), that the wages of any laborer or mechanic include the amount of costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the Contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(2) (i) The Contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the Contracting Officer for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under subparagraph (c)(1) of this clause. This information may be submitted in any form desired. Optional Form WH-347 (Federal Stock Number 029-005-00014-1) is available for this purpose and may be purchased from the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402. The Contractor is responsible for the submission of copies of payrolls by all subcontractors. (Approved by the Office of Management and Budget under OMB Control Number 1214-0149.)

(ii) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the Contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(A) That the payroll for the payroll period contains the information required to be maintained under paragraph (c) (1) of this clause and that such information is correct and complete;

(B) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3; and

(C) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(iii) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirements for submission of the "Statement of Compliance" required by subparagraph (c)(2)(ii) of this clause.

(iv) The falsification of any of the above certifications may subject the Contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 3729 of Title 31 of the United States Code.

(3) The Contractor or subcontractor shall make the records required under subparagraph (c)(1) available for inspection, copying, or transcription by authorized representatives of HUD or its designee, the Contracting Officer, or the Department of Labor and shall permit such representatives to interview employees during working hours on the job. If the Contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the Contractor, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(d) (1) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship and Training, Employer and Labor Services (OATELS), or with a State Apprenticeship Agency recognized by OATELS, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by OATELS or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the Contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated in this paragraph, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the Contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator of the Wage and Hour Division determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event OATELS, or a State Apprenticeship Agency recognized by OATELS, withdraws approval of an apprenticeship program, the Contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(2) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under

the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed in the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate in the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate in the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate in the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the Contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(3) Equal employment opportunity. The utilization of apprentices, trainees, and journeymen under this clause shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

(e) Compliance with Copeland Act requirements. The Contractor shall comply with the requirements of 29 CFR Part 3, which are hereby incorporated by reference in this contract.

(f) Contract termination; debarment. A breach of this contract clause may be grounds for termination of the contract and for debarment as a Contractor and a subcontractor as provided in 29 CFR 5.12.

(g) Compliance with Davis-Bacon and related Act requirements. All rulings and interpretations of the Davis-Bacon and related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract.

(h) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this clause shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the Contractor (or any of its subcontractors) and the PHA, HUD, the U.S. Department of Labor, or the employees or their representatives.

(i) Certification of eligibility.

(1) By entering into this contract, the Contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the Contractor's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(2) No part of this contract shall be subcontracted to any person or firm ineligible for award of a United States Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(3) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

(j) Contract Work Hours and Safety Standards Act. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics, including watchmen and guards, shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the provisions set forth in subparagraph (j)(1) of this clause, the Contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such Contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic (including watchmen and guards) employed in violation of the provisions set forth in subparagraph (j)(1) of this clause, in the sum of $27 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by provisions set forth in subparagraph (j)(1) of this clause. DOL posts current fines at: https://www.dol.gov/whd/govcontracts/cwhssa.htm#cmp

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the Contractor or subcontractor under any such contract or any Federal contract with the same prime Contractor, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime Contractor, such sums as may be determined to be necessary to satisfy any liabilities of such Contractor or subcontractor for unpaid wages and liquidated damages as provided in the provisions set forth in subparagraph (j)(2) of this clause.

(k) Subcontracts. The Contractor or subcontractor shall insert in any subcontracts all the provisions contained in this clause, and such other clauses as HUD or its designee may by appropriate instructions require, and also a clause requiring the subcontractors to include these provisions in any lower tier subcontracts. The prime Contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all these provisions.

47. Non-Federal Prevailing Wage Rates

(a) Any prevailing wage rate (including basic hourly rate and any fringe benefits), determined under State or tribal law to be prevailing, with respect to any employee in any trade or position employed under the contract, is inapplicable to the contract and shall not be enforced against the Contractor or any subcontractor, with respect to employees engaged under the contract whenever such non-Federal prevailing wage rate exceeds:

(1) The applicable wage rate determined by the Secretary of Labor pursuant to the Davis-Bacon Act (40 U.S.C. 3141 et seq.) to be prevailing in the locality with respect to such trade;

(b) An applicable apprentice wage rate based thereon specified in an apprenticeship program registered with the U.S. Department of Labor (DOL) or a DOL-recognized State Apprenticeship Agency; or

(c) An applicable trainee wage rate based thereon specified in a DOL-certified trainee program.

48. Procurement of Recovered Materials.

(a) In accordance with Section 6002 of the Solid Waste Disposal Act, as amended by the Resource Conservation and Recovery Act, the Contractor shall procure items designated in guidelines of the Environmental Protection Agency (EPA) at 40 CFR Part 247 that contain the highest percentage of recovered materials practicable, consistent with maintaining a satisfactory level of competition. The Contractor shall procure items designated in the EPA guidelines that contain the highest percentage of recovered materials practicable unless the Contractor determines that such items: (1) are not reasonably available in a reasonable period of time; (2) fail to meet reasonable performance standards, which shall be determined on the basis of the guidelines of the National Institute of Standards and Technology, if applicable to the item; or (3) are only available at an unreasonable price.

( ) Paragraph (a) of this clause shall apply to items purchased under this contract where: (1) the Contractor purchases in excess of $10,000 of the item under this contract; or (2) during the preceding Federal fiscal year, the Contractor: (i) purchased any amount of the items for use under a contract that was funded with Federal appropriations and was with a Federal agency or a State agency or agency of a political subdivision of a State; and (ii) purchased a total of in excess of $10,000 of the item both under and outside that contract.

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SPECIAL CONDITIONS

A. Project Site:
The project, for Springfield Metropolitan Housing Authority, involves Modernization of seventeen [17] dwelling units as part of a Scattered Sites Modernization Project.

B. Completion time per area:
For all work involved in the project and at the end of each working day, all other areas of the building and entrances to the buildings shall be maintained fully operational and so all services are functional such that there is no unnecessary inconvenience to the adjacent residents / dwelling units. The units will be vacant throughout the course of the work.

C. Clean up:
While working and upon completion of the work, the Contractor shall make every effort to keep the area dust and debris free and thoroughly clean all areas for debris, dirt and dust caused by his performance of work under this contract.

The Contractor at all times shall keep the premises free from the accumulation of waste materials or rubbish caused by his operation, specifically cleaning up shall be completed daily prior to the close of working hours.

If the Contractor fails to clean up daily, the Authority may do so and charge the Contractor the cost for doing so.

D. Communication:
All notices, demands, requests, instructions, approvals, proposals, and claims must be in writing.

E. Guarantee against claims:
The Contractor shall guarantee the Housing Authority against any and all claims arising out of the performance of the contract, including any damages to resident owned items.

F. Resident Notification:
The Contractor shall be required to disburse flyers to individual residents in notification of work to take place within or outside/adjacent their units. Such flyers will be provided by the Housing Authority.

G. Access to Apartments:
Keys to gain access to individual dwelling units shall be issued by the Housing Authority. All keys shall be returned to the Housing Authority prior to the close of business each day. Lost or missing keys issued to the Contractor shall result in the potential of rekeying all locks at the expense of the Contractor.

H. Amendments to the General Conditions:

1. Contracting Officer's Responsibilities:
   The Contracting Offices will not be responsible for construction means, methods, techniques, sequences, or procedures, or for safety precautions and programs in connection with the work, and he/she will not be responsible for the Contractor's failure to carry out the work in accordance with the Contract Documents.
2. Contractor's Responsibilities:
   The Contractor shall be responsible to the Housing Authority for the acts and omissions of all his employees and all subcontractors, their agents and employees, and all other persons performing any of the work under a contract with the Contractor.

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

The Contractor shall take all reasonable precautions for safety precautions for the safety of, and shall provide all reasonable protection to prevent damages, injury, and loss to:

All employees on the work and all other persons who may be affected thereby.

All the work and all materials and equipment to be incorporated therein, whether in storage on or off the site, under the care, custody, or control of the Contractor or any of his subcontractors.

Other property at the site or adjacent thereto, including lobbies, hallways, corridors, and trees, shrubs, lawns, walks, pavements, roadway systems, structures, and utilities not designated for removal or replacement in the course of construction.

3. Lien Restriction:
   The Contractor and Subcontractors are prohibited from placing a lien on the Housing Authority's property.

END OF DOCUMENT

"General Decision Number: OH20260007 01/02/2026

Superseded General Decision Number: OH20250007

State: Ohio

Construction Type: Residential

County: Clark County in Ohio.

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories).

Modification Number	Publication Date
0	01/02/2026

ENGI0018-027 05/01/2019

	Rates	Fringes
POWER EQUIPMENT OPERATOR (Bulldozer)	$ 37.02	15.20

ENGI0066-026 06/01/2023

	Rates	Fringes
POWER EQUIPMENT OPERATOR Crane	$ 36.92	24.01

LABO0265-004 06/01/2024

	Rates	Fringes
LABORER (Mason Tender-Brick)	$ 25.90	18.40

PAIN0707-001 05/01/2025

	Rates	Fringes
PAINTER (Brush and Roller)	$ 33.95	20.20

PLAS0109-006 06/01/2025

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 33.48	24.81

SHEE0033-016 06/01/2025

	Rates	Fringes
SHEET METAL WORKER (HVAC Duct Installation Only)	$ 20.40	16.50

SUOH2012-006 07/20/2012

	Rates	Fringes
BRICKLAYER	$ 28.40	11.78
CARPENTER	$ 20.19	6.51

ELECTRICIAN.....$ 19.68 9.46

LABORER: Common or General.....$ 21.50 5.23

OPERATOR: Backhoe/Excavator.....$ 25.25 9.38

OPERATOR: Bobcat/Skid Steer/Skid Loader.....$ 29.49 11.16

PLUMBER.....$ 20.00 5.52

ROOFER.....$ 16.85 3.83

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

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

Note: Executive Order 13658 generally applies to contracts subject to the Davis-Bacon Act that were awarded on or between January 1, 2015 and January 29, 2022, and that have not been renewed or extended on or after January 30, 2022. Executive Order 13658 does not apply to contracts subject only to the Davis-Bacon Related Acts regardless of when they were awarded. If a contract is subject to Executive Order 13658, the contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025. The applicable Executive Order minimum wage rate will be adjusted annually. Additional information on contractor requirements and worker protections under Executive Order 13658 is available at www.dol.gov/whd/govcontracts.

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

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage

determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

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

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

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

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

Survey Rate Identifiers

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

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

State Adopted Rate Identifiers

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

WAGE DETERMINATION APPEALS PROCESS

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

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

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

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

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

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

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

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

The request should be accompanied by a full statement of the interested party's position and any information (wage payment

data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

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

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

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END OF GENERAL DECISION
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SECTION 3

OF THE

HOUSING AND URBAN DEVELOPMENT ACT

OF 1968, AS AMENDED

THE FACTS

What does Section 3 Require?

Recipients and contactors must make a good faith effort to utilize Section 3 area residents as trainees and employees in connection with the project. Targeted recruitment and the section of Section 3 area residents for available positions are two examples of good faith efforts to meet this requirement.

Recipients and contractors must make a good faith effort to award contracts to Section 3 business concerns for work in connection with the project. An example of a good faith effort to make this requirement is the implementation of an affirmative action plan, which includes targets for the number and dollar value for awarding contracts to Section 3 business concerns.

Recipients and contractors must keep records and submit reports too HUD documenting the good faith efforts taken and the results of this actions. Examples of such documentation include letters to community organizations, employment development and business development centers; copies of solicitations for bids or proposals; and copies of affirmative action plans.

Key Terms

Section 3 Area – For the purpose of training and employment, the Section 3 area is the unit of local government, or the metropolitan area or nonmetropolitan county, as determined by HUD, which the project is located. For the purpose of contracting, the Section 3 area is the metropolitan area or nonmetropolitan county in which the project is located.

Section 3 Business Concerns – A Section 3 business concern is a business, which is located within the Section 3 area or is owned in substantial part by persons residing in the Section 3 area.

Section 3 Area Resident – A Section 3 area resident is any lower income individual residing with the Section 3 area.

SECTION 3: PROVIDING ECONOMIC OPPORTUNITIES THROUGH HUD PROGRAMS

A FACT SHEET

What is Section 3?

Section 3 is a provision of the Housing and Urban Development Act of 1968, which requires that programs of direct financial assistance administered by the U.S. Department of Housing and Urban Development (HUD) provide, to the greatest extent feasible, opportunities for job training and employment to lower income residents in connection with projects in their neighborhoods. Further, to the greatest extent feasible, contracts in connection with these projects are to be awarded to local businesses. Section 3 is a tool for fostering local economic development, neighborhood economic improvement an individual self-sufficiency.

Who Must Comply with Section 3 Requirements?

Section 3 applies to financial assistance awarded, provided, or otherwise made available to a project or activity under a program administered by HUD in aid of housing, urban planning, redevelopment, development, or renewal, public or community facilities and new community development. Section 3 does not apply to financial assistance made available solely in the form of insurance or guaranty or to tenant-based assistance. Recipients of Section 3 covered assistance include, but not limited to, States, units of local government, public housing agencies, Indian housing authorities, public and private nonprofit organizations, private agencies developers, builders, community development housing organizations, resident management corporations and resident councils. Also, contractors who perform work in connection with projects funded under covered programs must comply with Section 3 requirements. Section 3 applies to the following programs:

- Low Income Public Housing Programs
- Community Development Block Grant Programs
- Homeless Assistance Programs
- HOPE Programs
- HOME Programs
- National Affordable Housing Act Programs
- Fair Housing Initiatives Program
- Fair Housing Assistance Program

What Types of Economic Opportunities may be Available?

Administrative/Management

accounting
clerical/record keeping
research
word processing

Services

ADP/Computer
air conditioner repair
appliance repair
carpet consultants
catering
engineering
florists
janitorial
landscaping
lead-based paint removal
legal
manufacturing
marketing
monuments
photography
printing
supplier
transportation

Construction

architecture
bricklaying
carpentry
cement/masonry
demolition
drywall
electrical
elevator construction
fencing
heating
iron work
lathers
machine operation
painting
plastering
plumbing
surveying
tile setting

Is there a procedure for filing a complaint under Section 3?

A Complaint, formally called a grievance, may be filed alleging a violation of Section 3 requirements. Grievances may be field by Section 3 residents and by Section 3 business concerns. HUD investigates Grievances. Where appropriate, voluntary resolutions are sought. Those grievances that are not resolved voluntarily can result in an administrative hearing.

A grievance should be written and include:

- name and address of grievant
- name and address of recipient/contractor
- description of acts or omissions
- corrective action sought

Grievances should be filed with a Regional Office of the U.S. Department of Housing and Urban Development or with:

Assistant Secretary for Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
451 Seventh Street, S.W.
Washington, DC 20410-2000

What are sources of more information?

To learn more about specific economic opportunities in your community, contact your housing and community development agencies.

For additional technical information or guidance, contact the U.S. department of Housing and Urban Development, Assistant Secretary of Fair Housing and Equal Opportunity, Attention: Section 3 Compliance Division, at the above address or the closet Regional Office of Fair Housing and Equal Opportunity:

Regional Director
Office of Fair Housing and Urban Development
Thomas P. O'Neill, Jr. Federal Building
10 Causeway Street, Room 375
Boston, MA 02222-1092

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
26 Federal Plaza
New York, NY 10278-0068

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Liberty Square Building
105 South 7th Street
Philadelphia, PA 191106-3392

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Richard B. Russell Federal Building
75 Spring Street S.W.
Atlanta, GA 3003-3388

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Ralph H. Metcalfe Federal Building
77 West Jackson Boulevard
Chicago, IL 60604-5601

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
1600 Throckmorton
P.O. Box 2905
Fort Worth, TX 76113-2905

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Executive Tower Building
1405 Curtis Street
Denver, CO 80202-2349

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Phillip Burton Federal Building and U.S. Courthouse
450 Golden Gate Avenue
P.O. Box36003
San Francisco, CA 94102-3448

Regional Director
Office of Fair Housing and Equal Opportunity
U.S. Department of Housing and Urban Development
Arcade Plaza Building
1321 Second Avenue
Seattle, WA 98101-2058

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MINORITY BUSINESS ENTERPRISE STATEMENT

The policy of Springfield Metropolitan Housing authority [SMHA] is that maximum practicable opportunity to participate in the performance of contracts shall be provided minority business enterprises [MBE] as subcontractors and suppliers to contractors performing work or rendering services for prime contractors or subcontractors under the Springfield Metropolitan Housing Authority [SMHA] contracts.

The Contractor agrees to make a “good faith” effort to comply with this policy to the fullest extent practicable.

Among the matters to be considered in the award of the contact will be the extent to which the contractor will afford minority business enterprises [MBE] opportunity to participate in the performance of the contract.

“Minority Business Enterprises” [MBE] means a business enterprise that is owned or controlled by one or more socially or economically disadvantaged persons. Such persons include, but not limited to; Blacks, Puerto Ricans, Spanish-speaking Americans, American Indians, Eskimo, and Aleuts. The Contractor may rely on written presentations by subcontractors regarding their status as a minority business enterprise.

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PROVISIONS AND PROCEDURES PERTAINING TO
THE MINORITY BUSINESS ENTERPRISE PROGRAM IN
CONNECTION WITH HUD PROJECTS IN
COMPLIANCE WITH EXECUTIVE ORDER 11625
AFFIRMATIVE ACTION PLAN FOR UTILIZATION OF MINORITY BUSINESS

PROJECT NAME:_____ **PROJECT NO:**_____

DEVELOPER:_____ **GENERAL CONTRACTOR**:_____

CONTRACTING

Prior to the signing of Contracts between the Sponsor and General Contractor, the General Contractor shall provide the Sponsor a preliminary statement of Minority Business Utilization where known; where not known, such information shall be supplied prior to the signing of any Contract between the General Contractor and subcontractor(s), and forwarded the HUD, EO Division through the General Contractor within thirty (30) days of the signing of said Contract.

UTILIZATION OF BUSINESS

Each General Contractor and/or subcontractor undertaking work on the HUD project shall assure that to the greatest extent feasible, Contracts for work to be performed in connection with the project are awarded to minority business concerns.

The General Contractor or subcontractor shall, to the greatest extent feasible, utilize minority concerns for procurement (materials, supplies, services) to be performed in connection with the HUD project. To this end the General Contractor and/or subcontractors projects a Utilization Goal of $_____, (_____%).

CATEGORY	AMOUNT AVAILABLE IN DOLLARS	GOAL ALLOCATION AMT. PROJECTED IN DOLLARS
A. Minority Contractors	$	$
B. Minority Procurement	$	$

GOOD FAITH EFFORT

The following minority business referral agencies will be contracted: HUD, SBA, State OMBE and others: (List):_____

This is to certify that _____ will abide by and initiate in all our Contractors, to the greatest extent feasible, the requirements of Executor order 11625.

_____ _____
Signature Title Date

The contractor shall execute the Certificate of Compliance and cause all subcontractors undertaking work in connection with this contract to furnish the same.

SECTION 3 – CERTIFICATION

_____Will abide by and initiate with all their subcontractors to the greatest extent feasible the requirements of Section 3 of the Housing and Urban Development Act of 1968, 12 U.S.C. 170 lu.

_____

1. MANPOWER UTILIZATION TABLE

OCCUPATION CATEGORY	TOTAL WORK FORCE	SKILLED	TRAINEES	NO. OF PROJECT AREA RESIDENTS TO BE UTILIZED
				Skilled Trainees
TOTAL				

EMPLOYMENT CERTIFICATION

A. The company hereby certifies that the above table represents the appropriate number of employees

Positions required in the execution of _____ Contract No._____ and also represents the number of lower income project area residence that the company proposes to employee.

B. The Company certifies that it will make a good faith effort to employ the number of lower income employees stated above, utilizing such based organizations and services agencies as:_____ _____ and Opportunities Industrialization Center (OIC) and on the site company employment posters.

C. The Company certifies that the employees goals listed in the above table, approximate the ratio of lower income residents to the total population of the project area.

_____ _____
Company Authorized Signature

_____ _____
Date Title

APPENDIX #2

AFFIRMATIVE ACTION PLAN FOR UTILIZATION OF SECTION 3 PROJECT BUSINESS

The Company shall utilize business concerns located in the area of Project No._____, in contracting for work to be performed in connection with the completion of the contract. To this end, the Company shall require the services of companies in the project area engaged in the business of _____.

Subcontractors	Total Subcontract Dollar Amount	Proposed Sec. 3 Business Available For use	Total Subcontract to Section 3 Businesses Dollar Amount
	$		$
	$		$
	$		$

_____
Company

_____
Authorized Signature

_____
Title

_____
Date

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FORM OF CONTRACT

This AGREEMENT made this _____ day of _____, in the year _____ by and between _____, a company organized and existing under the laws of the State of Ohio, hereinafter called the Contractor, and SPRINGFIELD METROPOLITAN HOUSING AUTHORITY hereinafter referred to as the "SMHA"

WITNESSETH, That the Contractor and SMHA for the consideration stated herein mutually agree as follows:

ARTICLE 1. STATEMENT OF WORK: The Contractor shall furnish all labor, specified materials, equipment and services, and shall perform and complete all work required for the SCATTERED SITES MODERNIZATION 2026 PROJECT, in accordance with the Documents and Specifications which are incorporated herein by reference and made a part hereof.

ARTICLE 2. THE CONTRACT PRICE: The SMHA shall pay the Contractor for the performance of the Contractor the sum of: _____ dollars ($_____).

ARTICLE 3. THE CONTRACT DOCUMENTS: The Contract shall consist of the following parts.

1. This instrument.
2. General Conditions of the Contract for Construction [HUD 5370]
3. General Requirements and General Conditions.
4. Special Conditions
5. Equal Employment Opportunity Contract Specifications [Executive Order 11246]
6. Project Manual
7. Technical Specifications
8. Drawings.
9. Addenda

This instrument, together with the other documents enumerated in this Article 3, which said other documents are as fully a part of the Contract. In the event that any provision in any other component part of this Contract conflicts with any provision of any other component part, the component part first enumerated in this Article 3 shall govern, except as otherwise specifically stated. The various provisions in Addenda shall be construed in the order of preference on the component part which each modifies.

ARTICLE 4. CONTRACT DURATION: This project shall be completed within SEVEN HUNDRED [700] calendar days from the date specified in the Notice to Proceed. Refer to Phasing and Notice to Proceed.

ARTICLE 5. EQUAL EMPLOYMENT OPPORTUNITY: It is the policy of SMHA, that maximum opportunities for equal employment of minorities be provided by the Contractor in the performance of this Contract.

IN WITNESS WHEREOF, the parties hereto have caused this Instrument to be executed in two [2] counterparts as of the day and year first written above.

_____	Springfield Metropolitan Housing Authority
Contractor	
By:_____	By:_____
Title:_____	Ms. Michelle Lee-Hall, Executive Director
Address:_____	2026 W. Main Street Springfield, OH 45504
_____	

END OF DOCUMENT

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DIRECTIONS FOR PREPARATION OF PERFORMANCE AND PAYMENT OF BOND

For all construction and equipment contracts (including CSP Contracts) over $10,000.00, the contractor shall be required to furnish a performance and payment bond for 100% of the contract price, or separate performance an payment bonds, each for 50% or more of the contract price, or a 20% cash escrow or a 25% irrevocable letter of credit. A letter of credit submitted in lieu of a Performance and Labor & Material Bond will only be allowed for projects under $100,000. Personal or business checks are not acceptable in lieu of the 5% bid bond, Performance Bond, or Labor/Material Bond.

1. Individual sureties, partnerships, of corporations not in the surety business will be acceptable.

2. The name of the Principal shall be shown exactly as it appears in the Contract.

3. The penal sum shall not the less than required by the Specifications.

4. If the Principals are partners, or joint ventures, each member shall execute the bond as an individual, and state his place of residence.

5. If the Principal is a corporation, the bond shall be executed under its corporate seal. If the Corporation has no corporate seal, it shall so state and affix a scroll or adhesive seal following the corporate name.

6. The official character and authority of the person(s) executing the bond for the Principal, if a corporation, shall be certified by the Secretary or Assistant Secretary thereof under the corporate seal, or copies attached to such records of the corporation as will evidence the official character and authority of the officer, signing, duly certified by the Secretary of Assistant Secretary, under the corporate seal, to be a true copies.

7. The current power of attorney of the person signing for the surety company must be attached to the bond.

8. The date of the bond must not be prior to the date of the contract.

9. The following information must be placed on the bond by the surety company,

    a. The rate of the premium in dollars per thousand; and
    b. The total dollar amount of premium charged.

10. The signature of a witness shall appear in the appropriate place, attesting to the signature of each party of the bond.

11. Type or print the name underneath each signature appearing on the bond.

12. An executed copy of the bond must be attached to each copy of the Contract (original counterpart) intended for signing.

NOTE TO THE ARCHITECT: A Performance Bond and Payment Bond (often combined as one bond) are required. Bond forms should be included in the bid documents. Form should not include provisions which modify the substance of the contract, or unreasonable restrict the liability of a surety.

Moreover, unless required under State or local law, no provisions should be included which (a) requires arbitration of dispute in conflict with provisions of Paragraph 10 of the printed General Conditions, (b) reduces the time within which laborers and materialsmen must pursue their claims, (c) prescribes notice of claim and the parties to whom it must be directed, (d) limited the jurisdictions or courts where claims may be pursued or (e) otherwise deprives laborers and materialsmen of the full benefit of applicable law.

On each form, the following shall appear beneath the signatures space for Corporate surety and ahead of the space for “Certificate as to Corporate Principal”:

“The rate of premium on the bond is $_____ per thousand.
The total amount of premium charged is $_____.
(The above is to be filled inn by the surety company, and the power-of-attorney of the person signing for the surety company must be attached)”

NOTE: Bonding Company may use own form.

PERFORMANCE BOND

KNOW ALL MEN BY THESE PRESENT, That we, _____

_____, as Principal, and _____, as surety are held and firmly bound unto **Springfield Metropolitan Housing Authority**, in the penal sum of _____ Dollars ($_____), for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into certain contract with the **Springfield Metropolitan Housing Authority**, dated _____ _____, 20_____, for **Scattered Sites Modernization 2026 Project, Springfield, OH**.

Now, therefore, if the Principal shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contact and any extensions thereof that may be granted by **Springfield Metropolitan Housing Authority** with or without notice to be surety, and shall also well and truly perform and fulfill all undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said contract, notice to surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals this _____ day of _____, 20_____, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to the authority of its governing body.

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(ADDRESS) (BUSINESS ADDRESS)

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(ADDRESS) (BUSINESS ADDRESS)

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(ADDRESS) (BUSINESS ADDRESS)

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(ADDRESS) (BUSINESS ADDRESS)

ATTEST:

_____
(CORPORATE PRINCIPAL)

_____
(BUSINESS ADDRESS)

_____ _____
(AFFIX CORPORATE SEAL)

ATTEST:

(CORPORATE PRINCIPAL)

(BUSINESS ADDRESS)

(AFFIX CORPORATE SEAL)

The rate of premium on the bond is $_____ per thousand.

The total amount of premium charged is $_____.

(The above must be filled in by the surety)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the_____ _____, Secretary of the Corporation name as principal in the within bond, that _____ who signed the said bond on behalf of the principal was the _____ of said corporation; that I know his signature and his signature is genuine and that said bond was duly signed, sealed and attested to for ad in behalf of said Corporation by authority of its governing body.

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NOTE: Bonding Company may use own form.

PAYMENT BOND

KNOW ALL MEN BY THESE PRESENT, That we, _____

_____, as Principal,

and _____, as surety are held and firmly bound unto **Springfield Metropolitan Housing Authority**, in the penal sum of _____ Dollars ($_____), for the payment of which sum will and truly to be made, we bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal entered into certain contract with the **Springfield Metropolitan Housing Authority**, dated _____ _____, 20_____, for **Scattered Sites Modernization 2026 Project, Springfield, OH**.

Now, therefore, if the Principal shall promptly make payment to all personal supplying labor and material in the prosecution of the work provided for in said contract, and any and all duly authorized modifications of said contract that may hereafter be made, notice of which medications to the surety being hereby waived, then this obligation to be void; otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above bounded parties have executed this instrument under their several seals this _____ day of _____, 20_____, the name and corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to the authority of its governing body.

_____	_____ (SEAL)
	(INDIVIDUAL PRINCIPAL)
_____	_____
(ADDRESS)	(BUSINESS ADDRESS)
_____	_____ (SEAL)
	(INDIVIDUAL PRINCIPAL)
_____	_____
(ADDRESS)	(BUSINESS ADDRESS)
_____	_____ (SEAL)
	(INDIVIDUAL PRINCIPAL)
_____	_____
(ADDRESS)	(BUSINESS ADDRESS)
_____	_____ (SEAL)
	(INDIVIDUAL PRINCIPAL)
_____	_____
(ADDRESS)	(BUSINESS ADDRESS)

ATTEST:

_____
(CORPORATE PRINCIPAL)

_____
(BUSINESS ADDRESS)

_____ _____
(AFFIX CORPORATE SEAL)

ATTEST:

_____
(CORPORATE PRINCIPAL)

_____
(BUSINESS ADDRESS)

_____ _____
(AFFIX CORPORATE SEAL)

The rate of premium on the bond is $_____ per thousand.

The total amount of premium charged is $_____.

(The above must be filled in by the surety)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the_____ _____, Secretary of the Corporation name as principal in the within bond, that _____ who signed the said bond on behalf of the principal was the _____ of said corporation; that I know his signature and his signature is genuine and that said bond was duly signed, sealed and attested to for ad in behalf of said Corporation by authority of its governing body.

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FORMS TO BE SUBMITTED WITH BID

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DOCUMENT 00 41 13
SOLICITATION/BID FORM

To: SPRINGFIELD METROPOLITAN HOUSING AUTHORITY
2026 W. Main Street
Springfield, Ohio 45504

Project: **Scattered Sites Modernization 2026 Project**
Springfield Metropolitan Housing Authority

Bidder: _____

Date: _____

1.1 OFFER

Having examined the Place of The Work and all matters referred to in the Bid Documents and Contract Documents, HUD Documents, and related forms and affidavits, prepared by RDA Group Architects on behalf of Springfield Metropolitan Housing Authority for the above mentioned project, we the undersigned, hereby proposed to furnish all labor, specified materials, equipment and services required for Scattered Sites Modernization 2026 Project, all in accordance with and for the sum of:

Site 01 – Modernization 1002 Robinson Drive: $ _____

Site 02 – Modernization 1006 Robinson Drive: $ _____

Site 03 – Modernization 1300 Innisfallen Avenue: $ _____

Site 04 – Modernization 1200 Highland Avenue: $ _____

Site 05 – Modernization 306 Chestnut Avenue: $ _____

Site 06 – Modernization 563 E. Northern Avenue: $ _____

Site 07 – Modernization 328 Warren Drive: $ _____

Site 08 – Modernization 2122 Morgan Street: $ _____

Site 09 – Modernization 2130 Greenbrier Drive: $ _____

Site 10 – Modernization 2627 Lagonda Avenue: $ _____

Site 11 – Modernization 330 Lincoln Park Circle: $ _____

Site 12 – Modernization 359 Lincoln Park Circle: $ _____

Site 13 – Modernization 317 Indiana Avenue: $ _____

Site 14 – Modernization 350 E. John Street: $ _____

Site 15 – Modernization 2010 Huron Avenue: $ _____

Site 16 – Modernization 1923 Superior Avenue: $ _____

Site 17 – Modernization 1927 Superior Avenue: $ _____

Contingency Allowance [$10,000 per site]: $ 170,000.00

Building Permit Allowance [$1,000 per site]: $ 17,000.00

Total Bid Amount: [sum of all lines above including allowances]

$** _____ **$ _____
Figures Words

Contractors Note the Following:

A. Project is intended for award to one contractor for the total base bid amount with consideration of the alternates listed/selected by the Owner. The Owner intends to award the project providing it is within the funding limits, available budget, and overall estimate for the project.

B. Unit Prices: Contractor to complete Unit Cost Sheet attached to the end of this Bid Form. These prices will be used to calculate costs for any Change Orders, etc. Failure to complete the unit price sheet may render the bid non-responsive.

C. The selection of the lowest and best bidder is based on the lowest with any required alternates that are required to be removed. Lowest and best bidder can also include factoring in MBE/DBE participation and consideration of MBE prime contractors. Section 3 preference may also be considered.

1.2 ALTERNATES:

Add Alternate 06-01: SITE 06 – 563 E. NORTHERN AVENUE.

Remove existing, install new vinyl lap siding, soffits, porch ceilings, related trim, and aluminum wrap fascia / rakes complete. Remove existing, install new aluminum wrap trim at window / door openings.

ADD to the Base Bid:

$** _____ **$ _____
Figures words

Add Alternate 10-01: SITE 10 – 2627 LAGONDA AVENUE.

Remove existing, install new concrete driveway.

ADD to the Base Bid:

$** _____ **$ _____
Figures words

Add Alternate 10-02: SITE 10 – 2627 LAGONDA AVENUE.

Remove existing tree to the right of driveway complete, grind stump and restore lawn.

ADD to the Base Bid:

$** _____ **$ _____
Figures words

Add Alternate 11-01: SITE 11 – 330 LINCOLN PARK CIRCLE

Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 11-02: SITE 11 – 330 LINCOLN PARK CIRCLE

Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 13-01: SITE 13 – 317 INDIANA AVENUE.

Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system at entire detached garage structure. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 13-02: SITE 13 – 317 INDIANA AVENUE.

Remove existing load center, install new splice box at existing panel location, and install new load center that is located within the reach range for accessibility.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 15-01: SITE 15 – 2010 HURON AVENUE

Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 15-02: SITE 15 – 2010 HURON AVENUE

Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 16-01: SITE 16 – 1923 SUPERIOR AVENUE

Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 16-02: SITE 16 – 1923 SUPERIOR AVENUE

Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 17-01: SITE 17 – 1927 SUPERIOR AVENUE

Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

Add Alternate 17-02: SITE 17 – 1927 SUPERIOR AVENUE

Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

ADD to the Base Bid:

$**_____ **$_____
Figures words

1.3 UNIT PRICES

UP-1	Remove / replace 3/4” T&G OSB subfloor [per 4x8 sheet] on a per sheet [EA] basis	$_____/EA
UP-2	Remove / replace 7/16” OSB roof sheathing [anticipate minimum of 4’x4’ replacement] on a per sheet basis	$_____/EA
UP-3	Remove / replace 1/2" gypsum board [anticipate minimum of 4’x4’ replacement] on a per sheet basis	$_____/EA

1.4 SECURITY

Security in the sum of:_____($_____)

in the form of a_____is submitted herewith in accordance with the specifications.

1.5 ACCEPTANCE

In submitting this bid, it is understood that the right is reserved to reject any and all bids. If written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the undersigned within sixty (60) days after the opening thereof, the undersigned agrees to execute and deliver a contract in the prescribed form and furnish the required bonding within ten (10) days after the contract is presented for signature.

Springfield Metropolitan Housing Authority reserves the right to reject any and all bids or award only a portion of the project as it bests fits with the goals of SMHA.

1.6 CONTRACT TIME

Work shall be completed within_____ calendar days from Notice to Proceed. Maximum 700 calendar days.

The project will be accomplished in three phases, each with separate Notice to Proceed issued. This is due to funding limitations.

It is anticipated that the Contract will be in place in late February 2026 for a spring 2026 start date.

Contractor indicates the following anticipated Start Date of _____for the project considering contracts are executed by late February 2026.

1.7 ADDENDA

The following Addenda have been received. The modifications to the Contract Documents noted therein have been considered and all costs thereto are included in the Bid Sum.

Addendum #_____ Dated _____

Addendum #_____ Dated _____

Addendum #_____ Dated _____

1.8 BIDDER CERTIFICATIONS

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

1. The undersigned has not entered into collusion with any person in respect to this bid or any other bid or the submitting of bids for the contract for which this bid is submitted. Attached hereto is an affidavit in proof that the undersigned has not entered into any collusion with any person in respect to this proposal or any proposal or submitting of proposals for the contract for which this proposal is submitted.
2. The Bidder represents that he has [ ], has not [ ], participated in a previous contract or subcontract to the Equal Opportunity Clause prescribed by Executive Orders 10925, 1114, or 11246, or the Secretary of Labor, that he has [ ], has not [ ], filed all required compliance reports; and that the representations indicating submission of required compliance reports, signed by proposed subcontractors will be obtained prior to subcontract awards. (The above representation need not be submitted in connection with contract or subcontracts which are exempt from the clause.)
3. Bidder hereby agrees to comply with all City, State and Federal Statutes relating to Liability Insurance, Working Hour, Safety and Sanitary Regulations. Bidder further agrees that their bid amount includes all fees for permits, taxes, and insurance required or applicable to the work.
4. The Bidder will sign his bid on the line indicated below; if it will be a partnership the firm name will be signed, followed by the signature of the partner signing, his own name to be signed on the line beginning with the work “By”; if a corporation, name will be signed followed by the signature and the official title of the officer signing name
5. The Bidder has read and understands the Contract Documents and agrees to comply with all requirements of the Contract Documents, regardless of whether the Bidder has actual knowledge of the requirements and regardless of any statement or omission made by the Bidder which might indicate a contrary intention.
6. The Bidder represents that the bid is based upon the Standards specified in the Contract Documents.
7. The Bidder has visited the project site, become familiar with the local conditions and has correlated personal observations about the requirements of the Contract Documents. The Bidder has no outstanding questions regarding the interpretation or clarification of the Contract Documents.
8. Incomplete bid forms will be rejected as non-responsive.
9. The Bidder certifies that upon the award of a Contract, the Contractor will make a good faith effort to 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.
10. THE PENALTY FOR MAKING FALSE STATEMENTS IN OFFERS IS PRESCRIBED IN 18 U.S.C. 1001.

1.9 BID FORM SIGNATURES

If the Bidder is a Corporation, partnership or sole proprietorship, an officer, partner or principal of the Bidder, as applicable, shall print or type the legal name of the Bidder on the line provided and sign the Bid Form. If the Bidder is a joint venture, an officer, partner or principal, as applicable, of each member of the joint venture shall print or type the legal name of the applicable member on the line provided and sign the Bid Form. All signatures must be original.

Bidder/Company Name: _____

Authorized Signature: _____

Print name: _____

Title: _____

Mailing Address : _____

Telephone Number: _____

Email Address: _____

Federal Tax ID#: _____

If the bid is a joint venture or partnership, add additional forms of execution for each member of the joint venture in the appropriate form or forms as above.

END OF DOCUMENT

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BID BOND

KNOW ALL MEN BY THESE PRESENT, That we the undersigned, _____

_____, as Principal,

and _____, as SURETY

are held and firmly bound unto **Springfield Metropolitan Housing Authority**, hereinafter called the "LHA", in the penal sum of _____ Dollars ($_____),

lawful money in the United States, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH, that whereas the Principal has submitted the accompanying bid dated _____, 20__ _____, to **Springfield Metropolitan Housing Authority**, for **Scattered Sites Modernization 2026 Project, Springfield, OH**.

NOW, THEREFORE, if the Principal shall not withdraw said bid within the period specified therein after the opening of the same, or, if no period be specified, within sixty (60) days after the said opening, and shall within the period specified therefore, or, if no period be specified, with ten (10) days after the prescribed forms are presented to him for signature, enter into a written contact with the LHA in accordance with the bid as accepted, and give bond with good and sufficient surety or sureties, as may be required, for the faithful performance and proper fulfillment of such contract; or in the event of the withdrawal of said bid within the period specified, or the failure to enter into such contract and give such bond within the time specified if the Principal shall pay the LHA the difference between the amount specified in said bid and the amount for which the LHA may procure the require work, or supplies, or both. If the latter amount be in of the former, then the above obligation shall be void and of no effect, otherwise to remain in full force and virtue.

IN WITNESS WHEREOF, the above-bound parties have executed this instrument under their several seals this _____ day of _____, 20__ _____, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to the Authority of its governing body.

IN PRESENCE OF:

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(BUSINESS ADDRESS)

_____ _____ (SEAL)
(INDIVIDUAL PRINCIPAL)

_____ _____
(BUSINESS ADDRESS)

ATTEST:

_____ _____
(CORPORATE PRINCIPAL)

_____
(BUSINESS ADDRESS)

BY: _____ (SEAL)

_____ _____
(CORPORATE PRINCIPAL)

_____
(BUSINESS ADDRESS)

BY: _____ (SEAL)

POWER-OF-ATTORNEY FOR PERSONS SIGNING FOR SURETY COMPANY MUST BE ATTACHED TO BOND.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I,_____, certify that I am the Secretary of the Corporation named as Principal of the attached bond; that _____ _____ who signed the said bond on behalf of the Principal was then _____ _____ of said corporation; that I know his signature, and his signature thereto is genuine; and that said bond was duly signed, sealed and attest to for and in behalf of said corporation by authority of its governing body.

(CORPORATE SEAL)

BY:_____

TITLE: SECRETARY

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AFFIDAVIT

STATE OF _____

COUNTY OF _____

_____, being first duly sworn, deposes and says that he/she is _____ [Title], of the party making the foregoing proposal or bid, that such proposal or bid is genuine and not collusive or sham; that said bidder has not colluded, connived or agreed, directly or indirectly, sought by agreement or collusion or communication or conference with any person, to fix the bid prices of affiant or any other bidder, or to fix any overhead profit or cost element of said bid price, or that of any other bidder, or to secure any advantage against the **Springfield Metropolitan Housing Authority**, or any person interest in the proposed Contract; and that all statements in said proposal or bid are true.

_____
Name of Firm/Bidder

By:_____

Title:_____

SUBSCRIBED AND SWORN TO BEFORE ME THIS _____ DAY OF _____ _____, 20____.

_____
NOTARY PUBLIC

MY COMMISSION EXPIRES ON:_____

THIS SHEET LEFT INTENTIONALLY BLANK

U.S. Department of Housing and Urban Development

Office of Public and Indian Housing

Representations, Certifications, and Other Statements of Bidders

Public and Indian Housing Programs

Representations, Certifications, and Other Statements of Bidders

Public and Indian Housing Programs

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1. Certificate of Independent Price Determination

(a) The bidder certifies that--

(1) The prices in this bid have been arrived at independently, without, for the purpose of restricting competition, any consultation, communication, or agreement with any other bidder or competitor relating to (i) those prices, (ii) the intention to submit a bid, or (iii) the methods or factors used to calculate the prices offered;

(2) The prices in this bid have not been and will not be knowingly disclosed by the bidder, directly or indirectly, to any other bidder or competitor before bid opening (in the case of a sealed bid solicitation) or contract award (in the case of a competitive proposal solicitation) unless otherwise required by law; and

(3) No attempt has been made or will be made by the bidder to induce any other concern to submit or not to submit a bid for the purpose of restricting competition.

(b) Each signature on the bid is considered to be a certification by the signatory that the signatory--

(1) Is the person in the bidder's organization responsible for determining the prices being offered in this bid or proposal, and that the signatory has not participated and will not participate in any action contrary to subparagraphs (a)(l) through (a)(3) above; or

(2) (i) Has been authorized, in writing, to act as agent for the following principals in certifying that those principals have not participated, and will not participate in any action contrary to subparagraphs (a)(l) through (a)(3) above.

_____ [insert full name of person(s) in the bidder's organization responsible for determining the prices offered in this bid or proposal, and the title of his or her position in the bidder's organization];

(ii) As an authorized agent, does certify that the principals named in subdivision (b)(2)(i) above have not participated, and will not participate, in any action contrary to subparagraphs (a)(1) through (a)(3) above; and

(iii) As an agent, has not personally participated, and will not participate in any action contrary to subparagraphs (a)(1) through (a)(3) above.

(c) If the bidder deletes or modifies subparagraph (a)2 above, the bidder must furnish with its bid a signed statement setting forth in detail the circumstances of the disclosure.

[ ] [Contracting Officer check if following paragraph is applicable]

(d) Non-collusive affidavit. (applicable to contracts for construction and equipment exceeding $50,000)

(1) Each bidder shall execute, in the form provided by the PHA/IHA, an affidavit to the effect that he/she has not colluded with any other person, firm or corporation in regard to any bid submitted in response to this solicitation. If the successful bidder did not submit the affidavit with his/her bid, he/she must submit it within three (3) working days of bid opening. Failure to submit the affidavit by that date may render the bid nonresponsive. No contract award will be made without a properly executed affidavit.

(2) A fully executed "Non-collusive Affidavit" ☒ is, ☐ is not included with the bid.

2. Contingent Fee Representation and Agreement

(a) Definitions. As used in this provision:

"Bona fide employee" means a person, employed by a bidder and subject to the bidder's supervision and control as to time, place, and manner of performance, who neither exerts, nor proposes to exert improper influence to solicit or obtain contracts nor holds out as being able to obtain any contract(s) through improper influence.

"Improper influence" means any influence that induces or tends to induce a PHA/IHA employee or officer to give consideration or to act regarding a PHA/IHA contract on any basis other than the merits of the matter.

(b) The bidder represents and certifies as part of its bid that, except for full-time bona fide employees working solely for the bidder, the bidder:

(1) ☐ has, ☒ has not employed or retained any person or company to solicit or obtain this contract; and

(2) ☐ has, ☒ has not paid or agreed to pay to any person or company employed or retained to solicit or obtain this contract any commission, percentage, brokerage, or other fee contingent upon or resulting from the award of this contract.

(c) If the answer to either (a)(1) or (a)(2) above is affirmative, the bidder shall make an immediate and full written disclosure to the PHA/IHA Contracting Officer.

(d) Any misrepresentation by the bidder shall give the PHA/IHA the right to (1) terminate the contract; (2) at its discretion, deduct from contract payments the amount of any commission, percentage, brokerage, or other contingent fee; or (3) take other remedy pursuant to the contract.

3. Certification and Disclosure Regarding Payments to Influence Certain Federal Transactions (applicable to contracts exceeding $100,000)

(a) The definitions and prohibitions contained in Section 1352 of title 31, United States Code, are hereby incorporated by reference in paragraph (b) of this certification.

(b) The bidder, by signing its bid, hereby certifies to the best of his or her knowledge and belief as of December 23, 1989 that:

(1) No Federal appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with the awarding of a contract resulting from this solicitation;

(2) If any funds other than Federal appropriated funds (including profit or fee received under a covered Federal transaction) have been paid, or will be paid, to any person for influencing or attempting to influence an officer or employee of any agency, a Member of Congress, an officer or employee of Congress, or an employee of a Member of Congress on his or her behalf in connection with this solicitation, the bidder shall complete and submit, with its bid, OMB standard form LLL, "Disclosure of Lobbying Activities;" and

(3) He or she will include the language of this certification in all subcontracts at any tier and require that all recipients of subcontract awards in excess of $100,000 shall certify and disclose accordingly.

(c) Submission of this certification and disclosure is a prerequisite for making or entering into this contract imposed by section 1352, title 31, United States Code. Any person who makes an expenditure prohibited under this provision or who fails to file or amend the disclosure form to be filed or amended by this provision, shall be subject to a civil penalty of not less than $10,000, and not more than $100,000, for each such failure.

(d) Indian tribes (except those chartered by States) and Indian organizations as defined in section 4 of the Indian Self-Determination and Education Assistance Act (25 U.S.C. 450B) are exempt from the requirements of this provision.

4. Organizational Conflicts of Interest Certification

The bidder certifies that to the best of its knowledge and belief and except as otherwise disclosed, he or she does not have any organizational conflict of interest which is defined as a situation in which the nature of work to be performed under this proposed contract and the bidder's organizational, financial, contractual, or other interests may, without some restriction on future activities:

(a) Result in an unfair competitive advantage to the bidder; or,

(b) Impair the bidder's objectivity in performing the contract work.

☒ In the absence of any actual or apparent conflict, I hereby certify that to the best of my knowledge and belief, no actual or apparent conflict of interest exists with regard to my possible performance of this procurement.

5. Bidder's Certification of Eligibility

(a) By the submission of this bid, the bidder certifies that to the best of its knowledge and belief, neither it, nor any person or firm which has an interest in the bidder's firm, nor any of the bidder's subcontractors, is ineligible to:

(1) Be awarded contracts by any agency of the United States Government, HUD, or the State in which this contract is to be performed; or,

(2) Participate in HUD programs pursuant to 24 CFR Part 24.

(b) The certification in paragraph (a) above is a material representation of fact upon which reliance was placed when making award. If it is later determined that the bidder knowingly rendered an erroneous certification, the contract may be terminated for default, and the bidder may be debarred or suspended from participation in HUD programs and other Federal contract programs.

6. Minimum Bid Acceptance Period

(a) "Acceptance period," as used in this provision, means the number of calendar days available to the PHA/IHA for awarding a contract from the date specified in this solicitation for receipt of bids.

(b) This provision supersedes any language pertaining to the acceptance period that may appear elsewhere in this solicitation.

(c) The PHA/IHA requires a minimum acceptance period of [Contracting Officer insert time period] calendar days.

(d) In the space provided immediately below, bidders may specify a longer acceptance period than the PHA's/IHA's minimum requirement. The bidder allows the following acceptance period: calendar days. 60

(e) A bid allowing less than the PHA's/IHA's minimum acceptance period will be rejected.

(f) The bidder agrees to execute all that it has undertaken to do, in compliance with its bid, if that bid is accepted in writing within (1) the acceptance period stated in paragraph (c) above or (2) any longer acceptance period stated in paragraph (d) above.

7. Small, Minority, Women-Owned Business Concern Representation

The bidder represents and certifies as part of its bid/ offer that it --

(a) ☐ is, ☐ is not a small business concern. "Small business concern," as used in this provision, means a concern, including its affiliates, that is independently owned and operated, not dominant in the field of operation in which it is bidding, and qualified as a small business under the criteria and size standards in 13 CFR 121.

(b) ☐ is, ☐ is not a women-owned business enterprise. "Women-owned business enterprise," as used in this provision, means a business that is at least 51 percent owned by a woman or women who are U.S. citizens and who also control and operate the business.

(c) ☐ is, ☐ is not a minority business enterprise. "Minority business enterprise," as used in this provision, means a business which is at least 51 percent owned or controlled by one or more minority group members or, in the case of a publicly owned business, at least 51 percent of its voting stock is owned by one or more minority group members, and whose management and daily operations are controlled by one or more such individuals. For the purpose of this definition, minority group members are:

(Check the block applicable to you)

☐ Black Americans
☐ Hispanic Americans
☐ Native Americans
☐ Asian Pacific Americans
☐ Asian Indian Americans
☐ Hasidic Jewish Americans

8. Indian-Owned Economic Enterprise and Indian Organization Representation (applicable only if this solicitation is for a contract to be performed on a project for an Indian Housing Authority)

The bidder represents and certifies that it:

(a) ☐ is, ☐ is not an Indian-owned economic enterprise. "Economic enterprise," as used in this provision, means any commercial, industrial, or business activity established or organized for the purpose of profit, which is at least 51 percent Indian owned. "Indian," as used in this provision, means any person who is a member of any tribe, band, group, pueblo, or community which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs and any "Native" as defined in the Alaska Native Claims Settlement Act.

(b) ☐ is, ☐ is not an Indian organization. "Indian organization," as used in this provision, means the governing body of any Indian tribe or entity established or recognized by such governing body. Indian "tribe" means any Indian tribe, band, group, pueblo, or

community including Native villages and Native groups (including corporations organized by Kenai, Juneau, Sitka, and Kodiak) as defined in the Alaska Native Claims Settlement Act, which is recognized by the Federal Government as eligible for services from the Bureau of Indian Affairs.

9. Certification of Eligibility Under the Davis-Bacon Act (applicable to construction contracts exceeding $2,000)

(a) By the submission of this bid, the bidder certifies that neither it nor any person or firm who has an interest in the bidder's firm is a person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(b) No part of the contract resulting from this solicitation shall be subcontracted to any person or firm ineligible to be awarded contracts by the United States Government by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(c) The penalty for making false statements is prescribed in the U. S. Criminal Code, 18 U.S.C. 1001.

10. Certification of Nonsegregated Facilities (applicable to contracts exceeding $10,000)

(a) The bidder's attention is called to the clause entitled **Equal Employment Opportunity** of the General Conditions of the Contract for Construction.

(b) "Segregated facilities," as used in this provision, means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees, that are segregated by explicit directive or are in fact segregated on the basis of race, color, religion, or national origin because of habit, local custom, or otherwise.

(c) By the submission of this bid, the bidder certifies that it does not and will not maintain or provide for its employees any segregated facilities at any of its establishments, and that it does not and will not permit its employees to perform their services at any location under its control where segregated facilities are maintained. The bidder agrees that a breach of this certification is a violation of the Equal Employment Opportunity clause in the contract.

(d) The bidder further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) prior to entering into subcontracts which exceed $10,000 and are not exempt from the requirements of the Equal Employment Opportunity clause, it will:

(1) Obtain identical certifications from the proposed subcontractors;

(2) Retain the certifications in its files; and

(3) Forward the following notice to the proposed subcontractors (except if the proposed subcontractors have submitted identical certifications for specific time periods):

Notice to Prospective Subcontractors of Requirement for Certifications of Nonsegregated Facilities

A Certification of Nonsegregated Facilities must be submitted before the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Employment Opportunity clause of the prime contract. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

Note: The penalty for making false statements in bids is prescribed in 18 U.S.C. 1001.

11. Clean Air and Water Certification (applicable to contracts exceeding $100,000)

The bidder certifies that:

(a) Any facility to be used in the performance of this contract ☐ is, ☒ is not listed on the Environmental Protection Agency List of Violating Facilities:

(b) The bidder will immediately notify the PHA/IHA Contracting Officer, before award, of the receipt of any communication from the Administrator, or a designee, of the Environmental Protection Agency, indicating that any facility that the bidder proposes to use for the performance of the contract is under consideration to be listed on the EPA List of Violating Facilities; and,

(c) The bidder will include a certification substantially the same as this certification, including this paragraph (c), in every nonexempt subcontract.

12. Previous Participation Certificate (applicable to construction and equipment contracts exceeding $50,000)

(a) The bidder shall complete and submit with his/her bid the Form HUD-2530, "Previous Participation Certificate." If the successful bidder does not submit the certificate with his/her bid, he/she must submit it within three (3) working days of bid opening. Failure to submit the certificate by that date may render the bid nonresponsive. No contract award will be made without a properly executed certificate.

(b) A fully executed "Previous Participation Certificate"

☒ is, ☐ is not included with the bid.

13. Bidder's Signature

The bidder hereby certifies that the information contained in these certifications and representations is accurate, complete, and current.

_____ ☐

(Signature and Date)

_____

(Typed or Printed Name)

_____

(Title)

_____

(Company Name)

(Company Address)

OMB Approval No. 2502-0118
(Exp. 01/31/2026)

US Department of Housing and Urban Development
Office of Housing/Federal Housing Commissioner

US Department of Agriculture
Farmers Home Administration

Part I to be completed by Controlling Participant(s) of Covered Projects *(See instructions)* Reason for submission:		**For HUD HQ/FmHA use only**	
1. Agency name and City where the application is filed		**2**. Project Name, Project Number, City and Zip Code	
3. Loan or Contract amount $	**4**. Number of Units or Beds	**5**. Section of Act	**6**. Type of Project (check one) ☐ Existing ☐ Rehabilitation ☐ Proposed (New)

7. List all proposed Controlling Participants and attach complete organization chart for all organizations showing ownership %

Name and address (Last, First, Middle Initial) of controlling participant(s) proposing to participate	**8 Role of Each Principal in Project**	**9. SSN or IRS Employer Number (TIN)**

1. Schedule A contains a listing, for the last ten years, of every project assisted or insured by HUD, USDA FmHA and/or State and local government housing finance agencies in which the controlling participant(s) have participated or are now participating.
2. For the period beginning 10 years prior to the date of this certification, and except as shown on the certification:
a. No mortgage on a project listed has ever been in default, assigned to the Government or foreclosed, nor has it received mortgage relief from the mortgagee;
b. The controlling participants have no defaults or noncompliance under any Conventional Contract or Turnkey Contract of Sale in connection with a public housing project;
c. There are no known unresolved findings as a result of HUD audits, management reviews or other Governmental investigations concerning the controlling participants or their projects;
d. There has not been a suspension or termination of payments under any HUD assistance contract due to the controlling participant's fault or negligence;
e. The controlling participants have not been convicted of a felony and are not presently the subject of a complaint or indictment charging a felony. (A felony is defined as any offense punishable by imprisonment for a term exceeding one year, but does not include any offense classified as a misdemeanor under the laws of a State and punishable by imprisonment of two years or less);
f. The controlling participants have not been suspended, debarred or otherwise restricted by any Department or Agency of the Federal Government or of a State Government from doing business with such Department or Agency;
g. The controlling participants have not defaulted on an obligation covered by a surety or performance bond and have not been the subject of a claim under an employee fidelity bond;
3. All the names of the controlling participants who propose to participate in this project are listed above.
4. None of the controlling participants is a HUD/FmHA employee or a member of a HUD/FmHA employee's immediate household as defined in Standards of Ethical Conduct for Employees of the Executive Branch in 5 C.F.R. Part 2635 (57 FR 35006) and HUD's Standard of Conduct in 24 C.F.R. Part 0 and USDA's Standard of Conduct in 7 C.F.R. Part 0 Subpart B.
5. None of the controlling participants is a participant in an assisted or insured project as of this date on which construction has stopped for a period in excess of 20 days or which has been substantially completed for more than 90 days and documents for closing, including final cost certification, have not been filed with HUD or FmHA.
6.None of the controlling participants have been found by HUD or FmHA to be in noncompliance with any applicable fair housing and civil rights requirements in 24 CFR 5.105(a). (If any controlling participants have been found to be in noncompliance with any requirements, attach a signed statement explaining the relevant facts, circumstances, and resolution, if any).
7. None of the controlling participants is a Member of Congress or a Resident Commissioner nor otherwise prohibited or limited by law from contracting with the Government of the United States of America.
8.Statements above (if any) to which the controlling participant(s) cannot certify have been deleted by striking through the words with a pen, and the controlling participant(s) have initialed each deletion (if any) and have attached a true and accurate signed statement (if applicable) to explain the facts and circumstances.

I/We, the undersigned, certify under penalty of perjury that the information provided above is true and correct. WARNING: Anyone who knowingly submits a false claim or makes a false statement is subject to criminal and/or civil penalties, including confinement for up to 5 years, fines, and civil and administrative penalties. (18 U.S.C. §§ 287, 1001, 1010, 1012, 1014; 31 U.S.C. §3729, 3802).

Name of Controlling Participant	**Signature of Controlling Participant**	**Certification Date (mm/dd/yyyy)**	**Area Code and Tel. No.**
This form prepared by (print name)		**Area Code and Tel. No.**	

Schedule A: List of Previous Projects and Section 8 Contracts. Below is a complete list of the controlling participants' previous participation projects and participation history in covered projects as per 24 CFR, part 200 §200.214 and multifamily Housing programs of FmHA, State and local Housing Finance Agencies, if applicable. **Note:** Read and follow the instruction sheet carefully. Make full disclosure. Add extra sheets if you need more space. Double check for accuracy. If no previous projects, write by your name, "**No previous participation, First Experience"**.

1. Controlling Participants' Name (Last, First)	2. List of previous projects (Project name, project ID and, Govt. agency involved)	3.List Participants' Role(s) (indicate dates participated, and if fee or identity of interest participant)	4. Status of loan (current, defaulted, assigned, foreclosed)	5.Was the Project ever in default during your participation **Yes**	**No**	**If yes, explain**	6. Last MOR rating and Physical Insp. Score and date

Part II- For HUD Internal Processing Only

Received and checked by me for accuracy and completeness; recommend approval or refer to Headquarters after checking appropriate box.

Date (mm/dd/yyyy)	Tel No. and area code	☐ A. No adverse information; form HUD-2530 approval recommended.	☐ C. Disclosure or Certification problem
Staff	Processing and Control	☐ B. Name match in system	☐ D. Other (attach memorandum)

Signature of authorized reviewer	Signature of authorized reviewer	Approved ☐ Yes ☐ No	Date (mm/dd/yyyy)

Instructions for Completing the Previous Participation Certificate, form HUD-2530

Carefully read these instructions and the applicable regulations. A copy of the regulations published at 24 C.F.R. part 200, subpart H, § 200.210-200.222 can be obtained on-line at www.gpo.gov and from the Account Executive at any HUD Office. Type or print neatly in ink when filling out this form. Incomplete form will be returned to the applicant.

Attach extra sheets as you need them. Be sure to indicate "Continued on Attachments" wherever appropriate. Sign each additional page that you attach if it refers to you or your record. **Carefully read the certification before you sign it.** Any questions regarding the form or how to complete it can be answered by your HUD Account Executive.

Purpose: This form provides HUD/USDA FmHA with a certified report of all previous participation in relevant HUD/USDA programs by those parties submitting the application. The information requested in this form is used by HUD/USDA to determine if you meet the standards established to ensure that all controlling participants in HUD/USDA projects will honor their legal, financial and contractual obligations and are of acceptable risks from the underwriting standpoint of an insurer, lender or governmental agency. HUD requires that you certify and submit your record of previous participation, in relevant projects, by completing and signing this form, before your participation can be approved.

HUD approval of your certification is a necessary precondition for your participation in the project and in the capacity that you propose. If you do not file this certification, do not furnish the information requested accurately, or do not meet established standards, HUD will not approve your certification.

Note that approval of your certification does not obligate HUD to approve your project application, and it does not satisfy all other HUD program requirements relative to your qualifications.

Who Must Sign and File Form HUD-2530: Form HUD-2530 must be completed and signed by all Controlling Participants of Covered Projects, as such terms are defined in 24 CFR part 200 §200.212, and as further clarified by the Processing Guide (HUD notice H 2016-15) referenced in 24 CFR §200.210(b) and available on the HUD website at: http://portal.hud.gov/hudportal/HUD?src=/program_offices/housing/mfh/prevparticipation.

Where and When Form HUD-2530 Must Be Filed: The original of this form must be submitted to the HUD Office where your project application will be processed at the same time you file your initial project application. This form must be filed with applications for projects listed in 24 CFR §200.214 and for the Triggering Events listed at 24 CFR §200.218.

Review of Adverse Determination: If approval of your participation in a HUD project is denied, withheld, or conditionally granted on the basis of your record of previous participation, you will be notified by the HUD Office. You may request reconsideration in accordance with 24 CFR §200.222 and further clarified by the Processing Guide. Request must be made in writing within 30 days from your receipt of the notice of determination.

The Department of Housing and Urban Development (HUD) is authorized to collect this information by law 42 U.S.C. 3535(d) and by regulation at 24 CFR 200.210. This information is needed so that principals applying to participate in multifamily programs can become HUD-approved controlling participants. The information you provide will enable HUD to evaluate your record with respect to established standards of performance, responsibility and eligibility. Without prior approval, a controlling participant may not participate in a proposed or existing multifamily or healthcare project. HUD uses this information to evaluate whether or not controlling participants pose an unsatisfactory underwriting risk. The information is used to evaluate the potential controlling participants and approve only individuals and organizations that will honor their legal, financial and contractual obligations.

Privacy Act Statement: The Housing and Community Development Act of 1987, 42 U.S.C. 3543 requires persons applying for a Federally-insured or guaranteed loan to furnish his/her Social Security Number (SSN). HUD must have your SSN for identification of your records. HUD may use your SSN for automated processing of your records and to make requests for information about you and your previous records with other public agencies and private sector sources. HUD may disclose certain information to Federal, State and local agencies when relevant to civil, criminal, or regulatory investigations and prosecutions. It will not be otherwise disclosed or released outside of HUD, except as required and permitted by law. You must provide all of the information requested in this application, including your SSN. Failure to provide any of the information will result in your disapproval of participation in this HUD program. APPS SORN could be accessed in Federal Register / Vol. 81, No. 146 / Friday, July 29, 2016 / Notices ([Docket No. FR–5921–N–10] Implementation of the Privacy Act of 1974, as Amended; Amended System of Records Notice, Active Partners Performance System).

PRA Statement: The public reporting burden is estimated at 3 hours per response, including the time for reviewing instructions, searching existing data sources, gathering, and maintaining the data needed, and completing and reviewing the collection of information.
Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions to reduce this burden, to the Reports Management Officer, Paperwork Reduction Project, to the Office of Information Technology, US. Department of Housing and Urban Development, Washington, DC 20410-3600. When providing comments, please refer to OMB Approval No. 2502-0118. HUD may not conduct and sponsor, and a person is not required to respond to, a collection of information unless the collection displays a valid control number.

The collection is authorized by 12 U.S.C 1702-1715z; 42 U.S.C. 3535(d). HUD form 2530 is created to collect information as mandated by 24 CFR Part 200. The HUD-2530 form is used to protect HUD's Multifamily Housing and Healthcare programs by comprehensively assessing industry participants' risk. It is the Department's policy that participants in its housing programs honor their legal, financial, and contractual obligations. Accordingly, uniform standards are established for approvals, disapprovals, or withholding actions on principals in projects, based upon their past performances as well as other relevant information. Respondents such as owners, management agents, master tenants, general contractors, and nursing home operators are subject to review. The information on this form needs to be collected by the Department to evaluate participants' previous performance and compliance with contracts, regulations, and directives.

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Section 3 Clause

A. The work to be performed under this contract is subject to the requirements of section 3 of the Housing and Urban Development Act of 1968, 12 U.S.C. 170lu (section 3). The purpose of section 3 is to ensure that employment and other economic opportunities generated by HUD assistance or HUD-assisted projects covered by section 3, shall, to the greatest extent feasible, be directed to low- and very- low-income persons, particularly persons who are recipients of HUD assistance for housing.
B. The parties to this contract agree to comply with HUD's regulations in 24 CFR part 135, which implement section 3. As evidenced by their execution of this contract, the parties to this contract certify that they are under no contractual or other impediment that would prevent them from complying with the part 135 regulations.
C. The contractor agrees to send to each labor organization or representative of works with which the contractor has a collective bargaining agreement or other understanding, if any, a notice advising the labor organization or workers' representative of the contractor's commitments under this section 3 clause, and will post copies of this notice in conspicuous places at the work site where both employees and applicants for training and employment positions can see the notice. The notice shall describe the section 3 preference, shall set forth minimum number and job titles subject to hire, availability of apprenticeship and training positions, the qualifications for each; and the name and location of the person(s) taking applications for each of the positions; and the anticipated date the work shall begin.
D. The contractor agrees to include the section 3 clause in every subcontract subject to compliance with regulations in 24 CFR part 135, and agrees to take appropriate action, as provided in an applicable provision of the subcontract or in this section 3 clause, upon a finding that the subcontractor is in violation of the regulation in 24 CFR part 135, the contractor will not subcontract with an subcontractor where the contractor has notice or knowledge that the subcontractor has been found in violation of the regulations of 24 CFR 135.
E. The contractor will certify that any vacant employment positions, including training positions, that are filled (1) after the contractor is selected but before the contract is executed, and (2) with persons other than those to whom the regulation of 24 CFR part 135 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR part 135.
F. Noncompliance with HUD's regulations in 24 CFR part 135 may result in sanctions, termination of this contract for default, and debarment or suspension from future HUD assisted contracts.
G. In the event of a determination by the Executive Director or his/her designee that the Contractor is not in compliance with the section 3 clause or any rule, regulation, or report submission requirements of SMHA, this contract may be cancelled, terminated, or suspended in whole or in part.

_____

Contractor's Signature Date

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FORMS TO BE SUBMITTED TO HOUSING AUTHORITY FOR PROJECT DURING CONSTRUCTION

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Certification for a Drug-Free Workplace

U.S. Department of Housing and Urban Development

Applicant Name

Program/Activity Receiving Federal Grant Funding

Acting on behalf of the above named Applicant as its Authorized Official, I make the following certifications and agreements to the Department of Housing and Urban Development (HUD) regarding the sites listed below:

I certify that the above named Applicant will or will continue to provide a drug-free workplace by:

a. Publishing a statement notifying employees that the unlawful manufacture, distribution, dispensing, possession, or use of a controlled substance is prohibited in the Applicant's workplace and specifying the actions that will be taken against employees for violation of such prohibition.

b. Establishing an on-going drug-free awareness program to inform employees ---

(1) The dangers of drug abuse in the workplace;

(2) The Applicant's policy of maintaining a drug-free workplace;

(3) Any available drug counseling, rehabilitation, and employee assistance programs; and

(4) The penalties that may be imposed upon employees for drug abuse violations occurring in the workplace.

c. Making it a requirement that each employee to be engaged in the performance of the grant be given a copy of the statement required by paragraph a.;

d. Notifying the employee in the statement required by paragraph a. that, as a condition of employment under the grant, the employee will ---

(1) Abide by the terms of the statement; and

(2) Notify the employer in writing of his or her conviction for a violation of a criminal drug statute occurring in the workplace no later than five calendar days after such conviction;

e. Notifying the agency in writing, within ten calendar days after receiving notice under subparagraph d.(2) from an employee or otherwise receiving actual notice of such conviction. Employers of convicted employees must provide notice, including position title, to every grant officer or other designee on whose grant activity the convicted employee was working, unless the Federalagency has designated a central point for the receipt of such notices. Notice shall include the identification number(s) of each affected grant;

f. Taking one of the following actions, within 30 calendar days of receiving notice under subparagraph d.(2), with respect to any employee who is so convicted ---

(1) Taking appropriate personnel action against such an employee, up to and including termination, consistent with the requirements of the Rehabilitation Act of 1973, as amended; or

(2) Requiring such employee to participate satisfactorily in a drug abuse assistance or rehabilitation program approved for such purposes by a Federal, State, or local health, law enforcement, or other appropriate agency;

g. Making a good faith effort to continue to maintain a drug-free workplace through implementation of paragraphs a. thru f.

2. Sites for Work Performance. The Applicant shall list (on separate pages) the site(s) for the performance of work done in connection with the HUD funding of the program/activity shown above: Place of Performance shall include the street address, city, county, State, and zip code. Identify each sheet with the Applicant name and address and the program/activity receiving grant funding.)

Check here ☐ if there are workplaces on file that are not identified on the attached sheets.

I hereby certify that all the information stated herein, as well as any information provided in the accompaniment herewith, is true and accurate.

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

Name of Authorized Official	Title

Signature	Date
X	

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ctivity

U.S. Department of Housing and Urban Development

OMB Approval No.: 2535-0117 (exp. 1/31/2013)

on is estimated to average .50 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the . HUD may not collect this information, and you are not required to complete this form, unless it displays a currently valid OMB Control Number.

e Minority Business Development Plans shall be developed by each Federal Agency and that these annual plans shall establish minority business development objectives. The information is used by HUD to monitor activity and the designated minority business enterprise (MBE) goals. The Department requires the information to provide guidance and oversight for programs for the development of minority business enterprise ormation is not collected HUD would not be able to establish meaningful MBE goals nor evaluate MBE performance against these goals.
espondents, HUD generally discloses this data only in response to a Freedom of Information request.

of Housing and Urban Development, Federal Housing Administration, is authorized to solicit the information requested in this form by virtue of Title 12, United States Code, Section 1701 et seq., and regulations Regulations. It will not be disclosed or released outside the United States Department of Housing and Urban Development without your consent, except as required or permitted by law.

y	Check if: PHA ☐ IHA ☐	2. Location (City, State, ZIP Code)
	3b. Phone Number (Including Area Code)	4. Reporting Period ☐ Oct. 1 - Sept. 30 (Annual-FY)
		5. Program Code (Not applicable for CPD programs.) See explanation of codes at bottom of page. Use a separate sheet for each program code.
		6. Date Submitted to Field Office

f act	Type of Trade Code (See below) 7c.	Contractor or Subcontractor Business Racial/Ethnic Code (See below) 7d.	Woman Owned Business (Yes or No) 7e.	Prime Contractor Identification (ID) Number 7f.	Sec. 3 7g.	Subcontractor Identification (ID) Number 7h.	Sec. 3 7i.	Contractor/Subcontractor Name and Address 7j. Name	Street	City	State	Zip Code

s:
:
6 = Professional
7 = Tenant Services
8 = Education/Training
9 = Arch./Engrg. Appraisal
0 = Other

7d: Racial/Ethnic Codes:
1 = White Americans
2 = Black Americans
3 = Native Americans
4 = Hispanic Americans
5 = Asian/Pacific Americans
6 = Hasidic Jews

5: Program Codes (Complete for Housing and Public and Indian Housing programs only):
1 = All insured, including Section 8
2 = Flexible Subsidy
3 = Section 8 Noninsured, Non-HFDA
4 = Insured (Management
5 = Section 202
6 = HUD-Held (Management)
7 = Public/Indian Housing

s, sponsors, builders, agencies,
contract activities of $10,000 or
elopment Block Grants (entitle-
Grants; Housing Development
and Indian Housing Authorities;
nabilitation assistance.

reported only if such contracts
activity. Include only contracts

tract data in columns 7g and 7i.
onomic opportunities generated
ty development programs shall,
- and very low-income persons,
sistance for housing. Recipients
st also use Part I of form HUD-
s data. Form HUD-2516 is to be

completed for public and Indian housing and most community development programs. Form HUD-60002 is to be completed by all other HUD programs including State administered community development programs covered under Section 3.

A Section 3 contractor/subcontractor is a business concern that provides economic opportunities to low- and very low-income residents of the metropolitan area (or nonmetropolitan county), including a business concern that is 51 percent or more owned by low- or very low-income residents; employs a substantial number of low- or very low-income residents; or provides subcontracting or business development opportunities to businesses owned by low- or very low-income residents. Low- and very low-income residents include participants in Youthbuild programs established under Subtitle D of Title IV of the Cranston-Gonzalez National Affordable Housing Act.

The terms “low-income persons” and “very low-income persons” have the same meanings given the terms in section 3(b)(2) of the United States Housing Act of 1937. Low-income persons mean families (including single persons) whose incomes do not exceed 80 per centum of the median income for the area, as determined by the Secretary, with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 80 per centum of the median for the area on the basis of the Secretary’s findings that such variations are necessary because of prevailing levels of construction costs or unusually high or low-income families. Very low-income persons means low-income families (including single persons) whose incomes do not exceed 50 per centum of the median family income for the area, as determined by the Secretary with adjustments for smaller and larger families, except that the Secretary may establish income ceilings higher or lower than 50 per centum of the median for the area on the basis of the Secretary’s findings that such variations are necessary because of unusually high or low family incomes.

Submit two (2) copies of this report to your local HUD Office within ten (10) days after the end of the reporting period you checked in item 4 on the front.

Complete item 7h. only once for each contractor/subcontractor on each semi-annual report.

Enter the prime contractor's ID in item 7f. for all contracts and subcontracts. Include only contracts executed during this reporting period. PHAs/IHAs are to report all contracts/subcontracts.

ment submitting this report.

son responsible for maintaining

elopment Block Grant Identifica-
MC-25-0034. For Entitlement
ve programs, enter the latest

dollar amount rounded to the
in 7f, the dollar figure would be
ct.

best indicates the contractor's/
provided in 7f., the type of trade
e prime contractor. The "other"
all other activities except con-

he numeric code which indicates
and controller(s) of 51% of the
olled by any single racial/ethnic/
ppropriate. If the subcontractor
bcontractor and not to the prime

e Employer (IRS) Number of the
ipient of HUD funds. Note that
contract/subcontract awarded.

ter the Employer (IRS) Number
subcontract awarded from HUD
rovided, the respective Prime

Enter this information for each

firm receiving contract/subcontract activity only one time on each report for each firm.

Multifamily Housing Programs

1. **Grantee/Project Owner:** Enter the name of the unit of government, agency or mortgagor entity submitting this report.
3. **Contact Person:** Same as item 3 under CPD Programs.
4. **Reporting Period:** Check only one period.
5. **Program Code:** Enter the appropriate program code.

7a. Grant/Project Number: Enter the HUD Project Number or Housing Development Grant or number assigned.

7b. Amount of Contract/Subcontract: Same as item 7b. under CPD Programs.

7c. Type of Trade: Same as item 7c. under CPD Programs.

7d. Business Racial/Ethnic/Gender Code: Same as item 7d. under CPD Programs.

7e. Woman Owned Business: Enter Yes or No.

7f. Contractor Identification (ID) Number: Same as item 7f. under CPD Programs.

7g. Section 3 Contractor: Enter Yes or No.

7h. Subcontractor Identification (ID) Number: Same as item 7h. under CPD Programs.

7i. Section 3 Contractor: Enter Yes or No.

7j. Contractor/Subcontractor Name and Address: Same as item 7j. under CPD Programs.

Public Housing and Indian Housing Programs

PHAs/IHAs are to report all contracts/subcontracts. Include only contracts executed during this reporting period.

1. **Project Owner:** Enter the name of the unit of government, agency or mortgagor entity submitting this report. Check box as appropriate.
3. **Contact Person:** Same as item 3 under CPD Programs.
4. **Reporting Period:** Check only one period.
5. **Program Code:** Enter the appropriate program code.

7a. Grant/Project Number: Enter the HUD Project Number or Housing Development Grant or number assigned.

7b. Amount of Contract/Subcontract: Same as item 7b. under CPD Programs.

7c. Type of Trade: Same as item 7c. under CPD Programs.

7d. Business Racial/Ethnic/Gender Code: Same as item 7d. under CPD Programs.

7e. Woman Owned Business: Enter Yes or No.

7f. Contractor Identification (ID) Number: Same as item 7f. under CPD Programs.

7g. Section 3 Contractor: Enter Yes or No.

7h. Subcontractor Identification (ID) Number: Same as item 7h. under CPD Programs.

7i. Section 3 Contractor: Enter Yes or No.

7j. Contractor/Subcontractor Name and Address: Same as item 7j. under CPD Programs.

Construction Progress Schedule

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157 (Exp. 1/31/2027)

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. Construction practices and HUD administrative requirements establish the need that HAs maintain certain records or submit certain documents in conjunction with the oversight of the award of construction contracts for the construction of new low-income housing developments or modernization of existing developments. These forms are used by HAs to provide information on the construction progress schedule and schedule of amounts for contract payments. Responses to the collection of information are required to obtain a benefit or to retain a benefit. The information requested does not lend itself to confidentiality.

1. Name of Public Housing Agency/Indian Housing Authority (PHA/IHA)		
2. City	3. State	5. Project Name
4. Location		6. Project Number
7. Contract For		8. Contract Time (Days)
9. From (mm/dd/yyyy) To (mm/dd/yyyy)		10. Contract Price $

11. Number of Buildings	12. Number of Dwelling Units	13. Number of Rooms

(Submit as many pages as necessary to cover the construction period.)

Year (yyyy)								
Month								
Actual Monthly Value, Work in Place	($)							
Actual Accumulated Progress	(%)							
Anticipated Monthly Value	($)							
Accumulated Scheduled Progress	(%)							

Submitted by	Contractor's Name		
	Title	Signature	Date (mm/dd/yyyy)
Approved by	PHA/IHA		
	Title		Date (mm/dd/yyyy)
Approved by	Architect		Date (mm/dd/yyyy)

Instructions for Preparation of Construction Progress Schedule
Form HUD-5372

General. The information required for items 1 through 6 can be obtained from the contract documents. (7.) Enter the type of work awarded by the PHA/IHA. This may be "general construction," "plumbing," "heating," "electrical," etc., depending upon prime contract awards. (8.) Enter the contract time in calendar days (unless otherwise stated). (9.) Enter the starting and completion dates as established by the Notice to Proceed.

Year and Month. At the top of the Schedule, space is provided for inserting the "Year" and "Month" to identify the times during which the work is to be performed.

Year. Enter the year when the Notice to Proceed was issued. If the starting date of the contract is such that the time assigned for completion will be carried into a succeeding year, two yearly designations will be shown, each centered over the applicable spread of time for each year.

Month. The body of the Schedule is divided into Columns, each representing a period of one month. Starting in the Column with the month stated in the Notice to Proceed, enter at the top of each column the successive months corresponding to the entire spread of the total contract time. The Schedule must contain monthly columns to cover the entire active period of contract, with extra columns for possible overruns in contract time.

Computation of Anticipated Monthly Value of Work in Place

Before presenting the form for approval, enter in each monthly column the dollar value (omit cents) of the increment of work anticipated to be put in place during that interval of time. This shall be the Contractor's best estimate of the rate of progress for each month. This section contains a suggested guide for the elapsed contract time vs. progress percentages.

The horizontal total of the monthly dollars shown for "Anticipated Monthly Value" must equal the contract price shown in the heading.

Accumulated Scheduled Progress – %

Entries on this line shall show in percentage of total completion the cumulative stage of progress that is scheduled to be reached at the end of each monthly interval. It is generally sufficient to state this anticipated progress to the nearest tenth of one percent, but for very large contracts it may be advisable to extend computations to the nearest hundredth.

The entry for the first month's column should be the % obtained by the anticipated monthly dollar value of work in place at the close of the first month being divided by the contract price.

The entry for the second month's column is obtained by the sum of the anticipated monthly dollar values of work in place for Columns 1 and 2 being divided by the contract price.

Enter in the third month's column the percentage computed similarly, using the sum of dollar values of work in place for Columns 1, 2, and 3. Continue in this manner for the succeeding monthly columns until "100" is reached in the final column.

Charting Actual Progress. The horizontal space extending through the monthly columns is divided into "Actual Monthly Value of Work in Place – $" and Actual Accumulated Progress – %." In each monthly column show the actual accumulated % of progress and the actual value of work in place for that month, as the work progresses. An anticipated complete shutdown at some stage in the work because of adverse seasonal weather or otherwise, as may occur in road work, excavation (grading), etc., is readily shown by a gap.

The Contractor's name shall be placed in the lower left-hand corner of the form, together with the signature and title of the employee who prepared the Schedule and the date. The form then shall be sent to the Architect for review. If the Architect considers that changes are necessary to make the Schedule more realistic, it will withhold approval and so advise the Contractor. When the form is acceptable and approved by the Architect, and the PHA/ IHA, it will be returned to the Contractor, who shall reproduce and submit the number and style of prints required by the PHA/ IHA.

Normal building construction experience has proved that the rate of overall progress (as measured by work in place) accelerates slowly at the start, reaches its peak in the middle third of the construction period, and tapers down at the close. The data following illustrate the general average expectancy of a well-balanced operation and may be used as a guide. If the proposed progress lies within reasonable range of these check points, the Schedule may be considered satisfactory insofar as the time-performance feature is involved.

% of Contract Time	% of Accumulated Progress
0	0
10	2
20	8
30	20
40	37
50	57
60	75
70	89
80	96
90	99
100	100

The foregoing percentages must be tempered by consideration of seasonal weather conditions and other known conditions which may affect the progress of the work. These percentages are offered for information only.

Schedule of Amounts for Contract Payments

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157
(Exp. 1/31/2027)

No progress payments shall be made to the contractor unless a schedule of amounts for contract payments in accordance with the construction contract is received.

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. Construction practices and HUD administrative requirements establish the need that HAs maintain certain records or submit certain documents in conjunction with the oversight of the award of construction contracts for the construction of new low-income housing developments or modernization of existing developments. These forms are used by HAs to provide information on the construction progress schedule and schedule of amounts for contract payments. Responses to the collection of information are required to obtain a benefit or to retain a benefit. The information requested does not lend itself to confidentiality.

Project Name and Location	Project Number

Name, Address, and Zip Code of Contractor

Nature of Contract	Contract Number

Approved for Contractor by	Title	Date (mm/dd/yyyy)

Approved for Architect by	Title	Date (mm/dd/yyyy)

Approved for Owner by	Title	Date (mm/dd/yyyy)

Item No. (1)	Description of Item (2)	Quantity (3)	Unit of Measure (4)	Unit Price in Place (5)	Amount of Sub-Item (6)	Amount of Principal Item (7)
			D			
Total Amount of Contract or Carried Forward						$

To the best of my knowledge, all the information stated herein, as well as any information provided in the accompaniment herewith, is true and accurate.
Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

Signature of authorized represenative	Date signed (mm/dd/yyyy)

Instructions for Preparation of form HUD-51000

1. A separate breakdown is required for each project and prime contract instructions for preparation are given below.
   a. **Heading.** Enter all identifying information required for both forms.
   b. **Columns 1 and 2.** In column 1, enter the item numbers starting with No. 1, and in column 2 enter each principal division of work incorporated in the contract work.
      (1) **Master List.** The Master list contains the basic items into which any construction contract may be subdivided for the purpose of preparing the Construction Progress Schedule and the Periodical Estimates for Partial Payments. Only those items shall be selected which apply to the particular contract. To ensure uniformity, no change shall be made in the item numbers. Generally, about 25 to 40 major items appear in a contract.
      (2) **Items Subdivided.** In the Contractor's breakdown, against which all periodical estimates will be checked prior to payment, each major item must be subdivided into sub-items pertinent to the project involved and in agreement with the Contractor's intended basis for requesting monthly payments.
   c. **Column 3.** Enter the total quantity for each sub-item of each principal division of work listed in the breakdown.
   d. **Column 4.** Enter the appropriate unit of measure for each sub-item of work opposite the quantities described in column 3, such as “sq. ft.,” “cu. yd.,” “tons,” “lb.,” “lumber per M/BM,” “brickwork per M,” etc., applicable to the particular sub-item. Items shown on “lump sum” or equivalent basis will be paid for only on completion of the whole item and not on a percentage of completion basis.
   e. **Column 5.** Enter the unit price, in place, of each sub-item of work.
   f. **Column 6.** Enter the amount of each sub-item obtained by multiplying the quantities in column 3 by the corresponding unit prices in column 5.
   g. **Column 7.** Enter the amount of principal item only, obtained by adding the amounts of all sub-items of each principal division of work listed in column 6. Continue with the breakdown on form HUD-51000.
   h. The “Schedule of Amounts for Contract Payments” shall be signed and dated in the space provided at the bottom of each sheet of the form by the individual who prepared the breakdown for the Contractor.

2. The minimum number of copies required for each submission for approval is an original and two copies. When approved, one fully approved copy will be returned to the Contractor.

Master List of Items

Item No.	Division of Work	Item No.	Division of Work	Item No.	Division of Work
1	Bond	20	Rough Carpentry		**Site Improvements**
2	General Conditions	21	Metal Bucks	44	Retaining Walls
3	Demolition & Clearing	22	Caulking	45	Storm Sewers
		23	Weatherstripping	46	Sanitary Sewers
	Structures	24	Lath & Plastering-Drywall	47	Water Distribution System
4	General Excavation	25	Stucco	48	Gas Distribution System
5	Footing Excavation	26	Finish Carpentry	49	Electrical Distribution System
6	Backfill	27	Finish Hardware	50	Street & Yard Lighting
7	Foundation Piles & Caissons	28	Glass & Glazing	51	Fire & Police Alarm System
8	Concrete Foundations	29	Metal Doors	52	Fire Protection System
9	Concrete Superstructures	30	Metal Base & Trim	53	Street Work
10	Reinforcing Steel	31	Toilet Partitions	54	Yard Work
11	Waterproofing & Dampproofing	32	Floors	55	(Other)
12	Spandrel Waterproofing	33	Painting & Decorating	56	(Other)
13	Structural Steel	34	Screens		
14	Masonry	35	Plumbing		**Equipment**
15	Stonework	36	Heating	57	Shades & Drapery Rods
16	Miscellaneous & Ornamental Metal	37	Ventilating System	58	Ranges
17	Metal Windows	38	Electrical	59	Refrigerators
18	Roofing	39	Elevators	60	Kitchen Cabinets & Work Tables
19	Sheet Metal	40	Elevator Enclosures—Metal	61	Laundry Equipment
		41	Incinerators—Masonry & Parts	62	(Other)
		42	(Other)		
		43	(Other)	63	**Punch List** \2
				64	Lawns & Planting

1 General Conditions should be 3% to 5% of contract amount.
2 Punch List should be approximately 1/2 of 1% or $30 per dwelling unit, whichever is greater.

Periodic Estimate for Partial Payment

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157 (exp. 1/31/2027)

Submit original and one copy to the Public Housing Agency.
Complete instructions are on the back of this form.

Public reporting burden for this collection of information is estimated to average 3.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. This information is collected under the authority of Section 6(c) of the U.S Housing Act of l937 and HUD regulations. HAs are responsible for contract administration to ensure that the work for project development is done in accordance with State laws and HUD requirements. The contractor/subcontractor reports provide details and summaries on payments, change orders, and schedule of materials stored for the project. The information will be used to ensure that the total development costs, identified in the ACC, are kept as low as possible and consistent with HUD construction requirements. Responses to the collection are necessary to obtain a benefit. The information requested does not lend itself to confidentiality.

Name of Public Housing Agency	Periodic Estimate Number	Period From (mm/dd/yyyy) To (mm/dd/yyyy)

Location of Project	Project Number

Name of Contractor	Contract Number

Item Number (1)	Description of Item (2)	Completed to Date (3)
		$

Value of Contract Work Completed to Date (Transfer this total to line 5 on back of this sheet)	**$**

Instructions

Headings. Enter all identifying data required. Periodic estimates must be numbered in sequence beginning with the number 1.

Columns 1 and 2. The"Item Number"and "Description of Item" must correspond to the number and descriptive title assigned to each principal division of work in the "Schedule of Amounts for Contract Payments", form HUD-51000.

Column 3. Enter the accumulated value of each principal division of work completed as of the closing date of the periodic estimate. Enter the total in the space provided.

Certifications. The certification of the contractor includes the analysis of amounts used to determine the net balance due. In the first paragraph, enter the name of the Public Housing Agency, the contractor, and the date of the contract. Enter the calculations used in arriving at the "Balance Due This Payment" on lines 1 through 16.

Enter the contractor's name and signature in the certification following line 16.

The latter portion of this certification relating to payment of legal rates of wages, is required by the contract before any payment may be made. However, if the contractor does not choose to certify on behalf of his/her subcontractors to wage payments made by them, he/she may modify the language to cover only himself /herself and attach a list of all subcontractors who employed labor on the site during the period covered by the Periodic Estimate, together with the individual certifications of each.

Certification of the Contractor or Duly Authorized Representative

According to the best of my knowledge and belief, I certify that all items and amounts shown on the other side of this form are correct; that all work has been performed and material supplied in full accordance with the items and conditions of the contract between the (name of owner) _____ and (contractor) _____ dated (mm/dd/yyyy) _____, and duly authorized deviations, substitutions, alterations, and additions; that the following is a true and correct statement of the Contract Account up to and including the last day of the period covered by this estimate, and that no part of the "Balance Due This Payment" has been received.

1. Original Contract Amount			$
Approved Change Orders:			
2. Additions (Total from Col. 3, form HUD-51002)	$		
3. Deductions (Total from Col. 5, form HUD-51002)	$	(net) $	
4. Current Adjusted Contract Amount (line 1 plus or minus net)			$
Computation of Balance Due this Payment			
5. Value of Original Contract work completed to date (from other side of this form)			$
Completed Under Approved Change Orders			
6. Additions (from Col. 4, form HUD-51002)	$		
7. Deductions (from Col.5, form HUD-51002)	$	(net) $	
8. Total Value of Work in Place (line 5 plus or minus net line 7)			$
9. **Less:** Retainage, _____ %	$		
10. Net amount earned to date (line 8 less line 9)		$	
11. Less: Previously earned (line 10, last Periodic Estimate)		$	
12. Net amount due, work in place (line 10 less line 11)			$
Value of Materials Properly Stored			
13. At close of this period (from form HUD-51004)	$		
14. **Less:** Allowed last period	$		
15. Increase (decrease) from amount allowed last period	$		
16. Balance Due This Payment			**$**

I further certify that all just and lawful bills against the undersigned and his/her subcontractors for labor, material, and equipment employed in the performance of this contract have been paid in full in accordance with the terms and conditions of this contract, and that the undersigned and his/her subcontractors have complied with, or that there is an honest dispute with respect to, the labor provisions of this contract.

Name of Contractor	Signature of Authorized Representative	Title	Date (mm/dd/yyyy)

Certificate of Authorized Project Representative and of Contracting Officer

Each of us certifies that he/she has checked and verified this Periodic Estimate No. _____ ; that to the best of his/her knowledge and belief it is a true statement of the value of work performed and material supplied by the contractor; that all work and material included in this estimate has been inspected by him/her or by his/her authorized assistants; and that such work has been performed or supplied in full accordance with the drawings and specifications, all applicable accessibility requirements (including Section 504 and Title II of the Americans with Disabilities Act; and the Fair Housing Act and Title III of the Americans with Disa bilities Act, if applicable),the terms and conditions of the contract, and duly authorized deviations, substitutions, alterations, and additions, all of which have been duly approved.

We, therefore, approve as the "Balance Due this Payment" the amount of $ _____

Authorized Project Representative	Date (mm/dd/yyyy)	Contracting Officer	Date (mm/dd/yyyy)

I certify the information on this form and in any accompanying documentation is true and accurate. I acknowledge making, presenting, or submitting a false, fictitious, or fraudulent statement, representation, or certification may result in criminal, civil, and/or administrative sanctions, including fines, penalties, and confinement for up to 5 years, (18 U.S.C. §§ 287, 1001 and 31 U.S.C. §3729)

Schedule of Change Orders

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157
(exp. 1/31/2027)

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. This information is collected under the authority of Section 6(c) of the U.S Housing Act of l937 and HUD regulations. HAs are responsible for contract administration to ensure that the work for project development is done in accordance with State laws and HUD requirements. The contractor/subcontractor reports provide details and summaries on payments, change orders, and schedule of materials stored for the project. The information will be used to ensure that the total development costs, identified in the ACC, are kept as low as possible and consistent with HUD construction requirements. Responses to the collection are necessary to obtain a benefit. The information requested does not lend itself to confidentiality.

Instructions: Contractors use this form for reporting the details of approved Change Orders. Attach an original (or a opy) to each copy of the Periodic Estimate for Partial Payment (form HUD-51001) submission, and send to the Public Housing Agency. Complete all entries. Only Change Orders which bear the signatures required by the contract are to be recorded.

Name of Public Housing Agency	Supporting Periodic Estimate for Partial Payment Number	Period From (mm/dd/yyyy) to (mm/dd/yyyy)

Location of Project	Project Number

Name of Contractor	Contract Number

Approved Change Orders		Additions		Deductions
Change Order Number (1)	Dated (mm/dd/yyyy) (2)	Total Amount of Change Order (3)	Value of Work Completed to Date (4)	Total Amount of Change Order (5)
		$	$	$
Totals		$	$	$

Authorized Project Representative	**Date (mm/dd/yyyy)**

I certify that the information provided on this form and in any accompanying documentation is true and accurate. I acknowledge that making, presenting, or submitting a false, fictitious, or fraudulent statement, representation, or certification may result in criminal, civil, and/or administrative sanctions, including fines, civil penalties, and confinement for up to 5 years, (18 U.S.C. §§ 287, 1001 and 31 U.S.C. §3729)

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Schedule of Materials Stored

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157
(exp. 1/301/2027)

Public reporting burden for this collection of information is estimated to average 1.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestions for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. This information is collected under the authority of Section 6(c) of the U.S. Housing Act of l937 and HUD regulations. HAs are responsible for contract administration to ensure that the work for project development is done in accordance with State laws and HUD requirements. The contractor/subcontractor reports provide details and summaries on payments, change orders, and schedule of materials stored for the project. The information will be used to ensure that the total development costs, identified in the ACC, are kept as low as possible and consistent with HUD construction requirements. Responses to the collection are necessary to obtain a benefit. The information requested does not lend itself to confidentiality.

Instructions: This form is to be used to support the Periodic Estimate for Partial Payment (form HUD-51001). The contractor must prepare a separate schedule for his/her materials and for those of his/her subcontractors. Attach an original (or a copy) to each copy of the Summary of Materials Stored (form HUD-51004). Enter all identifying data and list materials stored. The listing of materials stored must correspond to the arrangement established on the Schedule of Contract Payments (form HUD-51000) and each item will be keyed by corresponding item number. This form must be signed as noted.

Name of Public Housing Agency	Supporting Periodic Estimate for Partial Payment Number	Period From (mm/dd/yyyy) To (mm/dd/yyyy)

Name and Location of Project	Project Number
Name of General Contractor	**Contract Number**
Name of Subcontractor	**Subcontract Number**

Item Number*	Description and Quality	Quantity	Unit of Measure	Unit Price at Site	Total Price
Amount Carried Forward					**$**

Total Amount or Amount Carried Forward **$**

Prepared by (Contractor's Representative)	**Date (mm/dd/yyyy)**	**Checked by** (Owner's Representative)	**Date (mm/dd/yyyy)**

I certify that the information provided on this form and in any accompanying documentation is true and accurate. I acknowledge that making, presenting, or submitting a false, fictitious, or fraudulent statement, representation, or certification may result in criminal, civil, and/or administrative sanctions, including fines, penalties, and imprisonment.

As identified in Schedule of Amounts for Contract Payments, form HUD-51000.

Previous Editions are Obsolete

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Summary of Materials Stored

U.S. Department of Housing and Urban Development
Office of Public and Indian Housing

OMB Approval No. 2577-0157
(exp. 1/31/2027)

Public reporting burden for this collection of information is estimated to average 2.5 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. HUD may not conduct or sponsor, and an applicant is not required to respond to a collection of information unless it displays a currently valid OMB control number. Comments regarding the accuracy of this burden estimate and any suggestion s for reducing this burden can be sent to the Reports Management Officer, Office of Policy Development and Research, REE, Department of Housing and Urban Development, 451 7th St SW, Room 4176, Washington, DC 20410-5000. When providing comments, please refer to OMB Approval No. 2577-0157. This information is collected under the authority of Section 6(c) of the U.S Housing Act of l937 and HUD regulations. HAs are responsible for contract administration to ensure that the work for project development is done in accordance with State laws and HUD requirements. The contractor/subcontractor reports provide details and summaries on payments, change orders, and schedule of materials stored for the project The information will be used to ensure that the total development costs, identified in the ACC, are kept as low as possible and consistent with HUD construction requirements. Responses to the collection are necessary to obtain a benefit. The information requested does not lend itself to confidentiality.

Instructions: This form is for the Contractor to summarize the value of materials stored at the site (as shown on the schedule, form HUD-51003). Use a separate line for the contractor and each of his/her subcontractors. Prepare an original and one copy, attach form HUD-51003, and send to the Public Housing Agency with the Periodic Estimate for Partial Payment, form HUD-51001. **Payment Value.** No more than 90 percent of the estimated value of the stored materials will be allowed, and only the net amount will be carried to line 13 on the back of the Periodic Estimate for Partial Payment, form HUD-51001. **Signatures.** This form must be signed by those employees of the contractor and of the Public Housing Agency who prepare and check the Schedule of Materials Stored, form HUD-51003.

Name of Public Housing Agency	Supporting Periodic Estimate for Partial Payment Number	Period From (mm/dd/yyyy)	To (mm/dd/yyyy)

Location of Project	Project Number

Name of General Contractor	Contract Number

Name of General Contractor or Subcontractor	**Amounts**
General Contractor	$
Subcontractors	$
Total	**$**
Less 10%	**$**
Net	**$**

Prepared by	**Date (mm/dd/yyyy)**	**Checked by**	**Date (mm/dd/yyyy)**

I certify that I or my authorized representatives have examined and checked in detail the invoices representing the cost of materials set forth in appended "Schedule of Materials Stored", form HUD-51003, dated (mm/dd/yyyy) __---------- submitted by __ ---------- _____ consisting of _____ sheets with an indicated cost of $ _____ , and find that the net unit prices set forth in the schedule are the same or less than the invoices examined, and that such materials were suitably stored at the site of the development as of (date)(mm/dd/yyyy) _____ .

Name of Owner	**By** (Authorized Representative)	**Title**	**Date (mm/dd/yyyy)**

Warning: HUD will prosecute false claims and statements. Conviction may result in criminal and/or civil penalties. (18 U.S.C. 1001, 1010, 1012; 31 U.S.C. 3729, 3802)

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U.S. Department of Labor
Wage and Hour Division

PAYROLL

(For Contractor's Optional Use; See Instructions at www.dol.gov/whd/forms/wh347instr.htm)

Persons are not required to respond to the collection of information unless it displays a currently valid OMB control number.

U.S. Wage and Hour Division

Rev. Dec. 2008

OMB No.: 1215-0149
Expires: 12/31/2011

NAME OF CONTRACTOR ☐ OR SUBCONTRACTOR ☐	ADDRESS	
PAYROLL NO.	FOR WEEK ENDING	PROJECT AND LOCATION / PROJECT OR CONTRACT NO.

(1) NAME AND INDIVIDUAL IDENTIFYING NUMBER (e.g., LAST FOUR DIGITS OF SOCIAL SECURITY NUMBER) OF WORKER	(2) NO. OF WITHHOLDING EXEMPTIONS	(3) WORK CLASSIFICATION	OT. OR ST.	(4) DAY AND DATE — HOURS WORKED EACH DAY	(5) TOTAL HOURS	(6) RATE OF PAY	(7) GROSS AMOUNT EARNED	(8) DEDUCTIONS: FICA	WITH-HOLDING TAX			OTHER	TOTAL DEDUCTIONS	(9) NET WAGES PAID FOR WEEK
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While completion of Form WH-347 is optional, it is mandatory for covered contractors and subcontractors performing work on Federally financed or assisted construction contracts to respond to the information collection contained in 29 C.F.R. §§ 3.3, 5.5(a). The Copeland Act (40 U.S.C. § 3145) contractors and subcontractors performing work on Federally financed or assisted construction contracts to "furnish weekly a statement with respect to the wages paid each employee during the preceding week." U.S. Department of Labor (DOL) regulations at 29 C.F.R. § 5.5(a)(3)(ii) require contractors to submit weekly a copy of all payrolls to the Federal agency contracting for or financing the construction project, accompanied by a signed "Statement of Compliance" indicating that the payrolls are correct and complete and that each laborer or mechanic has been paid not less than the proper Davis-Bacon prevailing wage rate for the work performed. DOL and federal contracting agencies receiving this information review the information to determine that employees have received legally required wages and fringe benefits.

Public Burden Statement

We estimate that is will take an average of 55 minutes to complete this collection, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. If you have any comments regarding these estimates or any other aspect of this collection, including suggestions for reducing this burden, send them to the Administrator, Wage and Hour Division, U.S. Department of Labor, Room S3502, 200 Constitution Avenue, N.W. Washington, D.C. 20210

(over)

Date _____

I, _____ _____
(Name of Signatory Party) (Title)

do hereby state:

(1) That I pay or supervise the payment of the persons employed by

_____ on the
(Contractor or Subcontractor)

_____; that during the payroll period commencing on the
(Building or Work)

_____ day of _____, _____, and ending the _____ day of _____, _____,

all persons employed on said project have been paid the full weekly wages earned, that no rebates have been or will be made either directly or indirectly to or on behalf of said

_____ from the full
(Contractor or Subcontractor)

weekly wages earned by any person and that no deductions have been made either directly or indirectly from the full wages earned by any person, other than permissible deductions as defined in Regulations, Part 3 (29 C.F.R. Subtitle A), issued by the Secretary of Labor under the Copeland Act, as amended (48 Stat. 948, 63 Start. 108, 72 Stat. 967; 76 Stat. 357; 40 U.S.C. § 3145), and described below:

_____

_____

_____

_____

(2) That any payrolls otherwise under this contract required to be submitted for the above period are correct and complete; that the wage rates for laborers or mechanics contained therein are not less than the applicable wage rates contained in any wage determination incorporated into the contract; that the classifications set forth therein for each laborer or mechanic conform with the work he performed.

(3) That any apprentices employed in the above period are duly registered in a bona fide apprenticeship program registered with a State apprenticeship agency recognized by the Bureau of Apprenticeship and Training, United States Department of Labor, or if no such recognized agency exists in a State, are registered with the Bureau of Apprenticeship and Training, United States Department of Labor.

(4) That:

(a) WHERE FRINGE BENEFITS ARE PAID TO APPROVED PLANS, FUNDS, OR PROGRAMS

☐ – in addition to the basic hourly wage rates paid to each laborer or mechanic listed in the above referenced payroll, payments of fringe benefits as listed in the contract have been or will be made to appropriate programs for the benefit of such employees, except as noted in section 4(c) below.

(b) WHERE FRINGE BENEFITS ARE PAID IN CASH

☐ – Each laborer or mechanic listed in the above referenced payroll has been paid, as indicated on the payroll, an amount not less than the sum of the applicable basic hourly wage rate plus the amount of the required fringe benefits as listed in the contract, except as noted in section 4(c) below.

(c) EXCEPTIONS

EXCEPTION (CRAFT)	EXPLANATION

REMARKS:

NAME AND TITLE	SIGNATURE

THE WILLFUL FALSIFICATION OF ANY OF THE ABOVE STATEMENTS MAY SUBJECT THE CONTRACTOR OR SUBCONTRACTOR TO CIVIL OR CRIMINAL PROSECUTION. SEE SECTION 1001 OF TITLE 18 AND SECTION 231 OF TITLE 31 OF THE UNITED STATES CODE.

Record of Employee Interview Instructions	U.S. Department of Housing and Urban Development Office of Davis-Bacon and Labor Standards	OMB Approval No. 2501-0009 (exp. 12/31/2024)

Instructions

General:

This form is to be used by HUD and local agency staff for recording information gathered during on-site interviews with laborers and mechanics employed on projects subject to Federal prevailing wage requirements. Typically, the staff that will conduct on-site interviews and use this form are HUD staff and fee construction inspectors, HUD Labor Standards staff, and local agency labor standards contract monitors.

Information recorded on the form HUD-11 is evaluated for general compliance and compared to certified payroll reports submitted by the respective employer. The comparison tests the veracity of the payroll reports and may be critical to the successful conclusion of enforcement actions in the event of labor standards violations. The thoroughness and accuracy of the information gathered during interviews is crucial.

Note that the interview itself and the information collected on the form HUD-11 are considered confidential. Interviews should be conducted individually and privately. All laborers and mechanics employed on the job site must be made available for interview at the interviewer's request. The employee's participation, however, is voluntary. Interviews shall be conducted in a manner and place that are conducive to the purposes of the interview and that cause the least inconvenience to the employer(s) and the employee(s).

Completing the form HUD-11:

Items 1a - 1c: Self-explanatory

Items 2a – 2d: Enter the employee's full name, a telephone number where the employee can be reached, and the employee's home address. Many construction workers use a temporary address in the locality of the project and have a more permanent address elsewhere from which mail may be forwarded to them. Obtain a more permanent address, if available. Ask the employee for a form of identification (e.g., driver's license) to verify their name.

Items 3a – 4c: Enter the employee's responses. Ask the employee whether they have a pay stub with them; if so, determine whether the pay stub is consistent with the information provided by the employee.

Items 5 – 7: Be certain that the employee's responses are specific. For example, job classification (#5) must identify the trade involved (e.g., Carpenter, Electrician, Plumber) – responses such as "journeyman" or "mechanic" are not helpful for our purposes.

Items 8 – 12b: Self-explanatory

Items 13 – 15c: These items represent some of the most important information that can be gathered while conducting on-site interviews. Please be specific about the duties you observed the employee performing. It may be easiest to make these observations before initiating the interview. Please record any comments or remarks that may be helpful. For example, if the employee interviewed was working with a crew, how many workers were in the crew? Was the employee evasive?

The level of specificity that is warranted is directly related to the extent to which interview(s) or other observations indicate that there may be violations present. If interviews indicate that there may be underpayments involving a particular trade(s), the interviewer is encouraged to interview as many workers in that trade(s) that are available.

Items 16 – 17b: The information on the form HUD-11 may be reviewed for general compliance, initially. For example, are the job classification and wage rate stated by the employee compatible with the classifications and wage rates on the applicable wage decision? Are the duties observed by the interviewer consistent with the job classification?

Item 18: Please place here any additional information you may want to document or continuing information from other lines that do not fit in their block space.

Once the corresponding certified payroll reports are received, the information on the HUD-11 shall be compared to the payroll reports. Any discrepancies noted between the HUD-11 information and that on the payroll report shall be noted in Item 16, Remarks. If discrepancies are noted, follow-up actions to resolve the discrepancies must be taken.

Record of Employee Interview

U.S. Department of Housing and Urban Development
Office of Davis-Bacon and Labor Standards

OMB Approval No. 2501-0009
(exp. 12/31/2024)

The public reporting burden estimate for this collection of information is 15 minutes per response on average. This includes reviewing instructions, searching existing data sources, gathering, and maintaining the data, and completing the collection of information. This information may not be collected, nor are you required to provide, the information requested unless it displays a currently valid OMB control number. The information collected ensures compliance with the Federal labor standards through recording interviews with construction workers. The information collected assists HUD in compliance monitoring of Federal labor standards. Any information collected is covered by the Privacy Act of 1974 and by 29 CFR 5.6(a)(5). Individuals and agencies collecting this information must maintain these records in a manner that protects the individuals on whom the information is maintained. The information collected herein is voluntary, and any information provided shall be kept confidential, but failure to provide the information collected may delay enforcement of any possible Federal labor standards violations if the information would have identified any. Comments concerning this burden statement, or this collection should be sent to: National Director, Office of Davis-Bacon and Labor Standards, 451 7th Street SW, Room 7108, Washington, DC 20410. When providing comments, please refer to OMB Approval 2501- 0009

Pursuant to 5 U.S.C. § 552a(e)(3), this Privacy Act Statement serves to inform you of the following concerning the collection of the information on this form.

A. **AUTHORITY:** Collection of the information solicited on this form is authorized by the Davis-Bacon Act as promulgated through Department of Labor Regulations under 29 CFR Part 5.

B. PURPOSE: The primary purpose for soliciting this information is to determine if the wages paid by an employer on a project covered by the Davis-Bacon Act are in compliance with federal labor standards.

C. ROUTINE USES: The information collected ensures compliance with the Federal labor standards through recording interviews with construction workers on topics related to wages paid on the project. The information is reviewed by HUD authorized personnel to ensure compliance with Federal labor standards under the Davis-Bacon Act on covered projects. If violations are found, the information collected is used to conduct enforcement actions to ensure restitution is paid to workers of covered projects are paid proper wages under the Davis-Bacon Act.

D. CONSEQUENCES OF FAILURE TO PROVIDE INFORMATION: The information collection is voluntary. Refusing to give information will not impact your status with your employer or the government. Failure to provide the information will limit the ability of HUD to determine if you were paid proper wages under the Davis-Bacon Act, and will limit the ability for HUD to seek restitution for you in the event a violation is found.

1a. Project Name			2a. Employee Name		
1b. Project Number			2b. Employee Phone Number (including area code)		
1c. Contractor or Subcontractor (Employer)			2c. Employee Home Address & Zip Code		
			2d. Verification of identification? Yes No		
3a. How long on this job?	3b. Last date on this job before today?	3c. No. of hours last day on this job?	4a. Hourly rate of pay?	4b. Fringe Benefits? Vacation Yes No; Medical Yes No; Pension Yes No	4c. Pay stub? Yes No
5. Your job classification(s) (list all) --- continue in block 18 if necessary					
6. Your duties --- continue in block 18 if necessary					
7. Tools or equipment used --- continue in block 18 if necessary					
8. Are you an apprentice or trainee? Yes No			10. Are you paid at least time and ½ for all hours worked in excess of 40 in a week? Yes No		
9. Are you paid for all hours worked? Yes No			11. Have you ever been threatened or coerced into giving up any part of your pay? Yes No		
12a. Employee Signature			12b. Date		
13. Duties observed by the Interviewer (Please be specific.)					
14. Remarks --- continue in block 18 if necessary					
15a. Interviewer Name (Please Print)		15b. Signature of Interviewer		15c. Date of Interview	

Payroll Examination

16. Remarks --- continue in block 18 if necessary	
17a. Signature of Payroll Examiner	17b. Date

CONFIDENTIAL

Record of Employee Interview

U.S. Department of Housing and Urban Development
Office of Davis-Bacon and Labor Standards

OMB Approval No. 2501-0009
(exp. 12/31/2024)

18. Additional Remarks

CONFIDENTIAL

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WARRANTY ON LABOR AND MATERIAL

TO: Springfield Metropolitan Housing Authority

From:_____

_____, Being duly sworn, deposes and says that:
(Name of Affiant)

1. He/She is the _____ of _____, having a contract
   (Title) (Name of Contractor)

   with the Springfield Metropolitan Housing Authority, dated _____, under Contract

   _____, involving work at the Housing Authority Projects named and located

   at: _____.

2. That the work performed by _____ shall be fully guaranteed for the period of _____ year/s. for Labor and Material from the date of contract completion. It is further stated that such guarantee will require that the response time shall not exceed three [3] working days from the time of notice being either in writing or by telephone.

_____
Signature of Affiant

_____
Title

Sworn to before me and subscribed in my presence at _____, this __

_____Day of _____, 20_____.

_____
Notary Public

My Commission Expires:_____

END OF DOCUMENT

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WAIVER OF LIEN

TO: Springfield Metropolitan Housing Authority

From:_____

_____, Being duly sworn, deposes and says that:
(Name of Affiant)

1. He/She is the _____ of _____, having a
(Title) (Name of Contractor)

   contract with the Springfield Metropolitan Housing Authority, dated _____,

   under Contract _____, involving work at the Housing Authority Projects

   named and located at: _____.

2. That the work performed by _____ under this contract has been performed, and all bills and claims for materials, labor and services to employees, subcontractors, material suppliers or others covering the work required to be performed under the contract have been

   paid in full by:_____, and there are not amounts unpaid by
(Name of Contractor)

   _____On the basis of which any lien has been or can be filed for the
(Name of Contractor)

   work done under the contract upon this property of the Springfield Metropolitan Housing Authority.

_____
Signature of Affiant

_____
Title

Sworn to before me and subscribed in my presence at _____, this

_____Day of _____, 20_____.

_____
Notary Public

My Commission Expires:_____

END OF DOCUMENT

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CERTIFICATE AND RELEASE

TO: Springfield Metropolitan Housing Authority

From:_____

Reference: Contract number _____, entered into the _____ day of _____,

20_____, between the Springfield Metropolitan Housing Authority, hereinafter referred to as SMHA and

_____, hereinafter referred to as the Contractor. For the Project:

_____

_____

_____

KNOW ALL MEN BY THESE PRESENTS

1. The undersigned hereby certifies that there is due and payable under the Contract and duly approved Change Orders and modifications the undisputed balance of $_____.
2. The undersigned further certifies that in addition to the amount set forth in Paragraph 1 hereof there are outstanding and unsettled of the following items which he claims are just and due and owing by SMHA to the Contractor.

   _____

   _____

   _____

   _____

   _____

   _____
3. The undersigned further certifies that all work required under this Contract including work required under Change Orders numbered _____ has been performed in accordance with the terms thereof, and that there are no claims of laborers or mechanics for unpaid wages arising out of the performance of this Contract, and that the wage rates paid by the Contractor and all Subcontractors were in conformity with the Contract provisions related to said wage rates.
4. Except for the amounts stated in Paragraphs 1 and 2 hereof, the undersigned has received from SMHA all sums of money payable to the undersigned under of pursuant to the aforementioned Contract or any change of modification thereof.
5. That in consideration of the payment of the amount stated in Paragraph 1 hereof, the undersigned does hereby release SMHA from any and all claims arising under or by virtue of this Contract except the amounts listed in Paragraph 2 hereof; provided, however that if for any reason SMHA does not pay in full amount stated in Paragraph 1, said deduction shall not affect the validity of this release, but the amount so deduct shall be automatically included in Paragraph 2 as an amount which the Contract has not released but will release upon payment thereof. The Contract further certifies that upon payment of the amounts listed in Paragraph 2 hereof, and of any amount which may be deducted from Paragraph 1 hereof, he will release SMHA from any and all claims of any nature whatsoever arising out of said Contract or modification thereof, and will execute such further releases or assurances as SMHA may request.

IN WITNESS WHEREOF, the undersigned has signed and sealed this instrument this:

_____ Day of _____, 20_____.

_____
Signature of Affiant

_____
Title

_____, Being duly sworn, deposes and says that:
(Name of Affiant)

1. He/She is the _____ of _____, and
   (Title) (Name of Contractor)

   with the Springfield Metropolitan Housing Authority, dated _____, under Contract

   _____, involving work at the Housing Authority Projects named and located

   at: _____.

2. That he/she has read the aforegoing Certificate and Release by him subscribed as:

   _____ of _____.
   (Title) (Name of Contractor)

Affiant further states that the matters and things stated herein are, to the best of his knowledge and belief, true.

_____
Signature of Affiant

_____
Title

Sworn to before me and subscribed in my presence at _____, this _____ Day of _____, 20_____.

_____
Notary Public

My Commission Expires:_____

END OF DOCUMENT

TECHNICAL SPECIFICATIONS

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SECTION 01 10 00 - SUMMARY

PART 1 GENERAL

1.1 DESCRIPTION OF THE PROJECT DOCUMENTS / SCOPE OF WORK

A. The work covered by these specifications consists of furnishing all labor, materials, and equipment necessary in connection with a Scattered Sites Modernization Project for Springfield Metropolitan Housing Authority.
   1. Work includes items as shown, subject to the terms and conditions of the contract, specifications and the drawings as listed.

B. Provide all materials and labor for work as noted herein for a complete project.
   1. IMPORTANT: Field verify all existing conditions, and coordinate all applicable requirements as related to the scope of the work.
   2. Drawings indicate general diagrammatic areas/extent of work, but in no way indicate the intricate nature of the work required for the successful completion of the project.

C. Provide any and all ancillary work related to the above work scope including repair of any Contractor damaged finishes within the work area.

D. Perform Work of Contract under a stipulated sum contract with Owner in accordance with Conditions of Contract.

1.2 CONTRACT / TEAM IDENTIFICATION

A. Project Identification: Scattered Sites Modernization 2026 Project

B. Project Locations:
1002 Robinson Drive, Springfield, OH 45506
1006 Robinson Drive, Springfield, OH 45506
1300 Innisfallen Avenue, Springfield, OH 45506
1220 Highland Avenue, Springfield, OH 45503
306 Chestnut Avenue, Springfield, OH 45503
563 E. Northern Avenue, Springfield, OH 45503
328 Warren Drive, Springfield, OH 45503
2122 Morgan Street, Springfield, OH 45503
2130 Greenbrier Drive, Springfield, OH 45503
2627 Lagonda Avenue, Springfield, OH 45503
330 Lincoln Park Circle, Springfield, OH 45505
359 Lincoln Park Circle, Springfield, OH 45505
317 Indiana Avenue, Springfield, OH 45505
350 E. John Street, Springfield, OH 45505
2010 Huron Avenue, Springfield, OH 45505
1923 Superior Avenue, Springfield, OH 45505
1927 Superior Avenue, Springfield, OH 45505

C. Owner:
Springfield Metropolitan Housing Authority [SMHA]
2026 W. Main Street
Springfield, OH 45504
937.325.7331 phone

D. Architect:
RDA Group Architects, LLC
7662 Paragon Road
Dayton, OH 45459
937.610.3440 phone

E. PME Engineer:
E2M Consulting Engineering
682 Tuxedo Place
Cincinnati, OH 45206
513.587.0050 phone

F. Environmental Consultant: mac Paran
3959 Fulton Grove Road
Cincinnati, OH 45245
513.752.9111 phone

1.3 SPECIFICATION CONVENTIONS

A. These specifications are written in imperative mood and streamlined form. This imperative language is directed to the Contractor, unless specifically noted otherwise. The words “shall be” are included by inference where a colon (:) is used within sentences or phrases.

B. The term ‘RDA’ or ‘Architect’ as referenced in these contract documents is RDA Group Architects.

C. The term ‘Owner’ as referenced in this specification is Springfield Metropolitan Housing Authority.

1.4 SCOPE OF WORK

A. Work of the Project includes the modernization of seventeen [17] dwelling units, including site, exterior, and interior improvements as outlined in the individual scope of work outlines [work varies by unit].
   1. All specific scope items shall be coordinated and reviewed on the drawings and specifications as applicable.
   2. Dwelling Units will be in a rent ready condition at the conclusion of work.

1.5 CONTRACTOR'S USE OF SITE[S] / SITE CONTROL

A. All units included in this project are currently VACANT and will remain VACANT throughout the duration of the project. Take all measures necessary to minimize the impact on the residents, provide protective measures at areas of work.
   1. Take all measures necessary to minimize the impact on the adjacent residents / neighbors.
   2. Provide protective measures at areas of work as appropriate for the conditions, in particular at all exterior / site work.

B. Coordinate work to allow continued Occupancy of all adjacent dwelling units, adjacent parking lots, driveways, access points, etc. throughout the duration of the project. Minimize impact to Owner / Residents.

C. Coordinate with Owner any activities which have the potential to affect continued operations of the facilities or impact life safety, security, etc.

D. Work Schedules: Perform all work between the hours of 8 AM and 5 PM Monday through Friday, unless work outside these hours and days is requested and granted.
   1. No work outside these hours is permitted without explicit Owner approval.
   2. Coordinate and schedule all aspects of the work, including how various disciplines work together, are sequenced, etc.
   3. Weekend and overtime work or increasing crew size may be required by the Owner at no additional cost if the Contractor fails to meet projected dates as prescribed in the contract and the progress schedule.
   4. Coordinate schedule / activities so as not to inconvenience the Owner unnecessarily.
   5. Coordinate schedule / activities with holidays, etc. so as not to inconvenience the Owner or Residents unnecessarily over holidays, weekends, etc.

E. Provide appropriate notification of Owner and Residents prior to starting work and throughout the duration of the project.

F. Staff project every day with a full crew capable of timely completion of work. Confirm that all materials, accessories, and other components are on-site and ready for installation prior to

beginning work for each work day. Advise project team if there are issues with scheduling prior to starting of work.

1.6 CONTRACT PERIOD / TIME OF COMPLETION

A. Notice to Proceed: anticipated award in **February 2026** from the Owner.
   1. Architect will issue notice to proceed with the agreed upon dates / contract period.

B. Project Phasing: This project will be phased into three [3] phases of work to accommodate project funding. Each phase will have a separately issued Notice to Proceed.
   1. Phase 1:
      a. Site 01 – 1002 Robinson Drive
      b. Site 02 – 1006 Robinson Drive
      c. Site 03 – 1300 Innisfallen Avenue
      d. Site 05 – 306 Chestnut Avenue
      e. Site 06 – 563 E. Northern Avenue
      f. Site 07 – 328 Warren Drive
   2. Phase 2:
      a. Site 04 – 1220 Highland Avenue
      b. Site 08 – 2122 Morgan Street
      c. Site 09 – 2130 Greenbrier Drive
      d. Site 10 – 2627 Lagonda Avenue
   3. Phase 3:
      a. Site 11 – 330 Lincoln Park Circle
      b. Site 12 – 359 Lincoln Park Circle
      c. Site 13 – 317 Indiana Avenue
      d. Site 14 – 350 E. John Street
      e. Site 15 – 2010 Huron Avenue
      f. Site 16 – 1923 Superior Avenue
      g. Site 17 – 1927 Superior Avenue
   4. The duration of each phase is anticipated at 180 calendar days.
   5. Anticipate periods of non-work [de mobilization] between each of the phases.

C. Date of Commencement: to be determined for each phase of work.
   1. Owner-Contractor Agreement or Notice to Proceed will be issued establishing the agreed upon construction start date.
   2. Final schedule will be coordinated with the Contractor.

D. Contract Period: **SEVEN HUNDRED [700] Calendar Days** from Date of Commencement.
   1. Provide a work start date within [7] calendar days upon issuance of the Owner-Contractor Agreement. A start date and completion date will be negotiated and a notice to proceed will be issued stating those dates.
   2. Consideration of material lead-times and fire alarm permit issuance will be given for establishing the NTP dates as applicable.
   3. Notify the RDA, in writing, upon determination of any delay in material delivery or the issuance of building permits.
   4. Coordinate schedule, phasing, and implementation of the work.

E. A contract will be issued in **February 2026**, after approval of the project by the Owner.
   1. The Contractor will be responsible to execute the project to allow shop drawings and product submittals to be prepared as quickly as possible such that the materials can be ordered with sufficient lead time to permit the work to be executed as scheduled prior to the date of substantial completion.

F. Notify Owner in writing fourteen [14] days prior to the Contract Completion date if an extension of contract time is necessary with a request for the extension and the reasoning for such request.

G. Liquidated Damages will be enforced for the failure to complete work in the specified contract period per Owner requirements.

1.7 WORK BY THE OWNER

A. Owner will separately contract for the following: **None / Not Applicable**

B. Coordinate any / all aspects of Work by Owner as they interface with Work.

1.8 PERMITS

A. Architect will apply for applicable building and zoning permits with the Authority Having Jurisdiction.

B. Pickup and pay for all applicable building and zoning permits once approved.
   1. Refer to Project Allowances for applicable permit allowance.

C. Furnish all required contractor trade permits as well as any other required permits for work in the right of way, etc.

1.9 APPLICABLE REFERENCES AND CODES

A. References will be found in each section that applies to that section.

B. Conform to reference standards by date of issue current as of date of Contract Documents.

C. When specified reference standard conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with the Ohio Building Code requirements as they relate to the work.

1.10 CONTRACTOR / GENERAL REQUIREMENTS

A. Protect all finishes and equipment scheduled to remain.

B. Commence and complete work as noted in the contract.

C. Coordinate equipment delivery and equipment staging with Owner prior to start of project. Anticipate no on-site storage being provided by Owner.

D. Pre-determine work phases with Owner to minimize disruption to operations.

E. Furnish labor, materials, equipment, and management required to complete the project.

F. Furnish all required logistics required to accomplish the work – including lifts, scaffolding, ladders, trash chutes, safety equipment, temporary protection, daily night seals / weather protection, etc.
   1. Coordinate and receive Owner approval for all staging and laydown areas, contractor parking, etc. prior to the start of work.
   2. Provide protection of all existing pavement, turf, landscaping, etc. from damage during construction. Restore site to original / like new condition upon completion of the work.

G. Visit the site to become thoroughly familiar with all working conditions, check and verify all dimensions, and site conditions. Any dimensions given or referred to in the specification or drawing are to be used purely as approximate and not as a basis for exact amounts for bidding. Promptly advise Architect of any discrepancies, errors with the specifications and drawings before bidding the work.

H. Provide a valid Certificate of Insurance, follow all Workman's Compensation requirements and regulations.

I. Provide all bonds, payment schedule, insurance as noted in the contract documents.

J. Pay for all building permits, trade permits, ROW permits, and any other required permits and inspections necessary to complete all work related to these specifications. Comply with Federal, State, and Local Codes.

K. Provide dumpsters or trash containers needed for construction purposes. Do not use Owner dumpsters or trash containers at any time for removal of materials, trash, or debris related to the Contractor's work. Remove debris from the site regularly and be placed within appropriate trash receptacles. Keep all work areas neat at all times. Take all considerations for safety. Do not leave trash or debris on the ground / around the project site.
   1. Run magnet around work areas daily to pickup stray nails, etc. when appropriate.

L. Take special care not to allow dust and debris to fall onto any equipment, material, personnel, or any room below the deck.

M. Safety: Take all safety precautions necessary or directed to ensure public safety.
   1. Neither Architect nor Owner are safety consultants. Any and all safety provisions shall be managed and coordinated by the Contractor.
   2. Safety is paramount and all personnel on site must wear appropriate personal protection equipment [PPE]. The Contractor is responsible for means and methods to ensure that proper PPE is provided. Failure to comply may result in dismissal from site.
   3. Barricade work area with appropriate construction grade barriers to establish boundaries of work area and assure safety for all workers and general public. All work areas must be properly barricaded from the general public prior to starting any work.
   4. Maintain job site in a neat and orderly fashion at all times.

N. Conduct all work according to OSHA recognized safe work practices. **COMPLY WITH APPLICIBLE OSHA STANDARDS, INCLUDING 1926 – REGULATIONS FOR CONSTRUCTION.**
   1. Non-compliance shall be a basis for making a bid non-responsive.
   2. If Contractor or sub-contractor is found to be in **VIOLATION (NON-COMPLIANCE) AT ANY TIME**, this could be a basis for termination of the purchase order/contract.

O. IMPORTANT: Failure to show or mention petty details shall not be warranted for the omission of anything necessary for the proper completion of the work.

P. The plans and specifications are intended to depict the general scope, layout and quality of workmanship required. The documents are not an "instruction manual" to execute the work nor are they intended to show or describe in detail every item necessary for the proper installation of the work. The means and methods required to execute the work described is the sole responsibility of the Contractor. The Contractor shall include the ancillary work required, whether explicitly stated or not, for the proper completion of the work as intended. The Contractor is required to meet or exceed building code requirements, applicable industry standards, ASTM standards, and/or manufacturer installation requirements as they relate to the work.

Q. The plans and specifications represent a single complete design package indicating the intended scope of the project in its entirety. As such, the project is structured to be awarded to a single Prime Contractor. The documents do not delineate bid packages or assign responsibilities to any subsequent subcontractors, dictate construction sequencing, nor provide coordination between any "trades". Such activities are the responsibility of the holder of the construction contract. In the event of a discrepancy within the drawings or between the drawings and the specifications, the more stringent requirement represented in the documents shall prevail.

R. Do not take advantage of any clerical errors, omissions, contradictions, or conflicts that may develop in plans, specifications, or details. Report such errors, ambiguities and discrepancies to the Architect immediately for clarification, revision, or correction prior to the submission of bids. If no notification is given, it shall be assumed that all specifications and conditions will be met.

S. Submission of a bid shall be considered the Contractor's Certification that the bid is based upon equipment and/or materials that meet or exceed the standards set forth by specification or equipment and/or materials identification. Should a Contractor's product be determined not

equal to that specified, the Contractor shall be required to provide and install a product acceptable as equal by the Architect at no additional cost to the Owner.

T. The submission of a bid shall indicate that the Contractor has visited the project site and is familiar with the conditions as they exist, and the modifications that may be necessary to provide a complete and professional finished project.

U. There is a strict **NO SMOKING** policy for all work. Any worker found smoking on the jobsite will be subject to removal from the project. No exceptions. Habitual offenders may be subject to a fine in the amount of $500 per occurrence.

V. Security: Contractor's Liability for Vandalism
   1. Secure and protect the project which is under the control of the Contractor. Include all such expenses for the securement and protection of the project, and for the repair and replacement of the work until that portion of the work is accepted as complete by the Owner. Take all measures necessary to provide such security.
   2. Promptly repair or otherwise remedy any and all damages, at Contractor's expense, to said portion of the project and of the accepted construction work caused by vandalism.
   3. Indemnify and hold the Owner harmless from and against all damages, liabilities, costs and expenses, including, without limitation, reasonable attorney fees, which may be imposed upon or incurred by the Owner as a result of the Contractor's failure to comply with the requirements of this section.

W. Insurance: Contractor shall be required to carry and submit evidence of manufacturer's and contractor's public liability insurance with bodily injury or death and property damage limits of not less than $500,000/$500,000/$500,000 to protect against claims for personal injury or death or damage to property of others and automobile liability on owned and non-owned motor vehicles used on the site/s or in connection therewith for a combined single limit for bodily injury and property damage of not less than $500,000 per occurrence. Also comply with the insurance provisions set forth in HUD form 5370, Section 36.
   1. Provide copy of Certificate of Insurance to Owner.
   2. Submit evidence of Worker's Compensation Insurance coverage
   3. Submit evidence of Builder's Risk Insurance.

X. Damages: Any and all damages to Owner Property or resident property shall be repaired equivalent to the existing by the Contractor at no cost to Owner. NO EXCEPTIONS.

1.11 CONTRACTOR QUALIFICATIONS

A. Establish and provide qualifications to Owner for their ability to complete this type of work. Qualifications may be established by:
   1. Provide references of similar projects, past performance, financial disclosures, etc. in the interest of selection of the lowest and best bidder for the project.
   2. Provide a letter of approval for the installation of the products from the manufacturer.
      a. Contractor must be properly trained and approved by the manufacturer for the installation of the products.
   3. Provide a recommendation from the supplier of the products.
   4. Demonstrating to Owner the capability to do the work. Contractor must have a minimum of five years documented experience in similar work.

B. Contractor is responsible for all work performed by the Sub-contractors.

C. Owner has the final authority to request a particular sub-contract not be engaged in the project. If this occurs, Owner and Contractor shall determine if there is an impact to the Contract amount, and negotiate, if necessary, to an adjustment in the Contract amount.
   1. No change to the Contract amount will be permitted if there is a change to the sub-contractor due to them utilizing alternate manufacturers or products that were not approved substitution requests.

1.12 JOB SUPERINTENDENT/EMPLOYEES

A. Each prime contractor and subcontractor shall have a qualified foreman on the project at all times when work is being accomplished.

B. Refrain from fraternization with building occupants other than specifically designated Owner's representatives.

C. Furnish the Owner with a list of personnel with phone numbers that will be working on the project and emergency contacts names and numbers that has the authority to handle emergencies on a 24 hour/seven days a week.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Follow all applicable requirements of HUD-5370 General Conditions for Construction Contracts and Owner's Terms and Conditions. If there should be a conflict between the Owner Requirements and those herein, the higher standard shall apply.

PART 3 EXECUTION

3.1 CONTRACT ADMINISTRATION

A. Architect is providing contract administration services for this project to the Owner. However, it shall be the responsibility of the Contractor and Owner to coordinate the proposed work, schedules, installations, permits, inspections, etc. as Architect is not on-site every day.

B. Contact Architect for clarification should there be questions regarding the interpretation or intent of the documents, field discovery, etc. that would impact or affect the work as proposed. Architect shall not be liable for deviations, field changes, and Owner changes during construction.

C. Field confirm all existing conditions, proposed installations and how they interface to ensure the systems can be installed per the intent of the documents and to meet applicable building and zoning codes, local requirements, Owner requirements, provide a watertight detail, meet aesthetic requirements, etc.

D. Meet all applicable building and zoning codes requirements whether specifically noted herein or not. Building codes represent the minimum acceptable standard.

E. Install all products, materials, installations, and the like in accordance with applicable industry standards, applicable manufacturer's details and instructions, in accordance with best practices, and building code provisions. The manufacturer details / requirements are the minimum acceptable standard; Architect's drawings may require additional work.

3.2 GENERAL PROJECT REQUIREMENTS

A. Safety is paramount and all personnel on site must wear appropriate personal protection equipment [PPE]. The Contractor is responsible for means and methods to ensure that proper PPE is provided. Failure to comply may result in dismissal from site.

B. Barricade work area with appropriate construction grade barriers to establish boundaries of work area and assure safety for all workers and general public. All work areas must be properly barricaded from the general public prior to starting any work.

C. Job sites will be maintained in an orderly and neat fashion at all times.

END OF SECTION

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SECTION 01 20 00 - PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Schedule of values.

B. Applications for payment.

C. Change procedures.

D. Unit prices.

E. Alternates.

F. Project Allowances.

G. Defect assessment.

1.2 PREVAILING WAGE / PAYROLL REPORT REQUIREMENTS

A. The work of this project is subject to Davis-Bacon Prevailing Wages and applicable reporting requirements. Include all applicable prevailing wages in the bid amount.

B. Refer to the Prevailing Wage Rates included with the Bid documents. Certified Payroll Reports will be required.

C. Provide Certified payroll reports indicating compliance to the Owner on a monthly basis.
   1. Pay Applications will not be processed without approved payroll reports submitted to the Owner.

D. Employee interviews to confirm compliance with the prevailing wage requirements may be accomplished at any time by the Owner. Do not obstruct or otherwise prevent employee interviews.

1.3 TAXES

A. Pay all applicable taxes, including applicable sales and use taxes, and other taxes as required by governing law.
   1. Owner is a tax-exempt entity.
   2. Owner will provide tax exempt forms upon request.
   3. Owner will not compensate or reimburse Contractor for any taxes paid on the project.

1.4 RETAINAGE

A. Owner will withhold retainage in the amount of ten percent [10%] from the payment otherwise due [for both labor and materials] of each progress Application for Payment up to a total project completion of 50%, after which no further retainage will be withheld providing work is performing satisfactorily. Refer to HUD Form 5370.

B. Retainage will be released in accordance with the Terms of HUD Form 5370.

1.5 STORED MATERIALS [ON OR OFF SITE]

A. Owner will pay for materials stored on-site.

B. Owner will pay for materials stored off-site providing proper documentation of the stored materials is provided, including documentation of location of stored materials, supporting invoices, shipping / bill of lading, photo documentation, and proper insurance [paid for by the Contractor] is in place at the location of stored materials.

1.6 SCHEDULE OF VALUES

A. Submit schedule of values on HUD Form 51000 or AIA G702 / G703 forms.

B. Submit Schedule of Values three [3] days prior to the Pre-Construction meeting for approval by Architect and Owner.

C. Approved Schedule of Values will be signed at the Pre-Construction meeting.

D. Format:
   1. Utilize Table of Contents of this Project Manual [CSI Divisions].
   2. Identify each line item with number and title of major specification Section.
   3. Identify each applicable CSI division / defined work scope / component.
   4. Identify site mobilization, general conditions, bonds and insurance.
   5. Identify separate line item for each allowance and alternate [as applicable]

E. Schedule of values should be broken down by building / address.

F. Revise schedule to list approved Change Orders, with each Application for Payment.

1.7 APPLICATIONS FOR PAYMENT

A. Submit each application for payment on HUD Form 51001 or AIA G702/G703 forms.
   1. Provide an invoice number on the application for payment, or provide a cover letter invoice on company letterhead with an invoice number.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.
   1. Complete every entry, notarize and execute by a person authorized to sign document on behalf of the Contractor. Include amounts for work completed following previous Application for Payment whether or not payment has been received, include amounts of Change Orders issued before last day of construction period covered by application.
   2. Stored materials included in application must have supporting documentation that verifies amount required, do not include overhead and profit on stored material.
   3. Each application for payment following the initial Application for Payment shall be consistent for payment with previous applications.

C. Payment Period: Monthly.

D. “Pencil Copy”: Submit one week prior to application for payment for review and approval by Architect and Owner. Submit Electronically to Architect in PDF format unless directed otherwise.

E. “Application for Payment”: Upon acceptance of the “Pencil Copy”, submit the “Application for Payment. Submit Electronically to Architect in PDF format unless directed otherwise. Architect will review, certify for payment, and submit to Owner.
   1. Submit updated construction schedule with each Application for Payment as applicable to the work.
   2. Submit all required waivers of lien / partial release of lien [including applicable subcontractors] in accordance with Owner requirements.
   3. Submit certified payroll reports for all contractors.

F. Failure to submit required paperwork, including supporting documents can delay the processing of the Application for Payment.

1.8 CHANGE PROCEDURES

A. Construction Bulletin: Architect / Owner may issue a Construction Bulletin [Proposal Request] including a detailed description of proposed change with supplementary or revised Drawings and specifications. Prepare and submit estimate within 7 days.

B. Stipulated Sum/Price Change Order: Based on Proposal Request / Construction Bulletin and Contractor's fixed price quotation.

C. Unit Price Change Order: For contract unit prices and quantities, the Change Order must be executed prior to beginning any work. The Change Order will be based on fixed unit price basis provided in the Bid Form.

D. Architect will advise of minor changes in the Work not involving adjustment to Contract Sum/Price or Contract Time by issuing supplemental instructions on Architect's approved forms.

E. Architect will issue a Change Order for all changes to Contract Sum and for all changes to the Contract Time upon Owner's approval of a proposal from Contractor.

F. Change Order Forms: HUD / AIA G701 or other approved forms with all required backup documentation.
   1. No "change order" will be prepared for costs expended from project allowances which do not require a change to contract sum or time.

G. Correlation Of Contractor Submittals:
   1. Promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as separate line item and adjust Contract Sum/Price.
   2. Promptly revise construction progress schedules to reflect change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.
   3. Promptly enter changes in Project Record Documents.

H. Important: All change orders must be fully executed prior to beginning any work. Failure to comply will result in contractor request being denied and completed at no cost to Owner.

1.9 UNIT PRICES

A. Document unit price quantities. Architect / Owner will confirm quantities as required. Contractor may not be paid for unit cost work without documentation of the work accomplished.

B. Unit Price Includes: Full compensation for required labor, products, tools, equipment, plant and facilities, transportation, services and incidentals; erection, application or installation of item of the Work; overhead and profit.

C. Final payment for Work governed by unit prices will be made on basis of actual measurements and quantities accepted by Architect / Owner multiplied by unit price for Work incorporated in or made necessary by the Work.

1.10 UNIT PRICE SCHEDULE

A. Remove / replace 3/4" T&G OSB subfloor [per 4x8 sheet] on a per sheet [EA] basis.

B. Remove / replace 7/16" OSB roof sheathing [anticipate minimum of 4'x4' replacement] on a per sheet [EA] basis.

C. Remove / replace 1/2" gypsum board [anticipate minimum of 4'x4' replacement on a per sheet [EA] basis.

1.11 ALTERNATES

A. Alternates listed on Bid Form will be reviewed and accepted or rejected at Owner's option. Accepted Alternates will be identified in Owner-Contractor Agreement.

B. Coordinate related work and modify surrounding work.

1.12 SCHEDULE OF ALTERNATES

A. Add Alternate 06-01: SITE 06 – 563 E. NORTHERN AVENUE: Remove existing, install new vinyl lap siding, soffits, porch ceilings, related trim, and aluminum wrap fascia / rakes complete. Remove existing, install new aluminum wrap trim at window / door openings.

B. Add Alternate 10-01: SITE 10 – 2627 LAGONDA AVENUE: Remove existing, install new concrete driveway.

C. Add Alternate 10-02: SITE 10 – 2627 LAGONDA AVENUE: Remove existing tree to the right of driveway complete, grind stump and restore lawn.

D. Add Alternate 11-01: SITE 11 – 330 LINCOLN PARK CIRCLE: Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

E. Add Alternate 11-02: SITE 11 – 330 LINCOLN PARK CIRCLE: Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

F. Add Alternate 13-01: SITE 13 – 317 INDIANA AVENUE: Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system at entire detached garage structure. Prep and paint all rooftop components to match roof color.

G. Add Alternate 13-02: SITE 13 – 317 INDIANA AVENUE: Remove existing load center, install new splice box at existing panel location, and install new load center that is located within the reach range for accessibility.

H. Add Alternate 15-01: SITE 15 – 2010 HURON AVENUE: Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

I. Add Alternate 15-02: SITE 15 – 2010 HURON AVENUE: Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

J. Add Alternate 16-01: SITE 16 – 1923 SUPERIOR AVENUE: Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

K. Add Alternate 16-02: SITE 16 – 1923 SUPERIOR AVENUE: Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

L. Add Alternate 17-01: SITE 17 – 1927 SUPERIOR AVENUE: Remove existing shingle roof and underlayment complete to deck at primary residence. Install new ice and water shield, underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

M. Add Alternate 17-02: SITE 17 – 1927 SUPERIOR AVENUE: Remove existing shingle roof and underlayment complete to deck at detached garage. Install new ice and water shield,

underlayment, and shingle roof system. Prep and paint all rooftop components to match roof color.

1.13 PROJECT ALLOWANCES

A. Contingency Allowance:
   1. Provide in bid a draw down allowance in the amount of **$170,000 [one hundred seventy thousand dollars]** for use as a project contingency allowance.

B. Building Permit Allowance:
   1. Provide in bid a draw down allowance in the amount of **$17,000 [seventeen thousand dollars]** for securing applicable building permits.

C. Contractor's costs for Products, delivery, installation, labor, insurance, payroll, taxes, bonding, equipment rental, overhead and profit are included in Change Orders authorizing expenditure of funds from this Contingency Allowance.

D. Do not expend or proceed with work outside of the scope of the project which utilizes the contingency allowance without authorization and approval of Architect and Owner.

E. Identify and track actual expenditures as they occur over the duration of the project not afterward. Any work commenced without Owner approval is at Contractor’s risk. Maintain a running tally of the remaining balance of each allowance.

F. Credit back to the Owner any unused funds at the end of the project via a Change Order.

1.14 FINAL APPLICATION FOR PAYMENT

A. Refer to provisions in Section 01 77 00 for Application for Payment at Substantial Completion.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Architect / Owner, it is not practical to remove and replace the Work, the Architect / Owner will direct appropriate remedy.

C. Authority of Architect / Owner to assess defects and identify payment adjustments is final.

D. Non-Payment For Rejected Products: Payment will not be made for rejected products.

END OF SECTION

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SECTION 01 25 00 – SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 WORK INCLUDES

A. Includes administration and procedural requirement for Substitutions.
   1. Substitutions' for Cause: Changes due to project conditions, such as unavailable of product.
   2. Substitutions' for Convenience: Changes that may offer advantages to the Owner.

1.2 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions / Approved Equal: Submit request for substitution as outlined in this section for manufacturers not named.
   1. Architect / Owner is the decision maker if the proposed "approved equal" is in fact equal and approved. Any decision rendered is final.
   2. Any Contractor, Sub-contractor, or Supplier who makes their own judgement as to "approved equal" and includes within their bid without a formal approval is doing so at their own risk.

1.3 SUBSTITUTIONS PROCEDURES

A. The materials, products, and equipment described in the Bid Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution. The burden of proof of the merit of the proposed substitution is upon the Bidder. Absolutely no substitutions shall be considered after the Contract award unless specifically noted in the Contract Documents. All substitution requests must come from a bidding Contractor [not materials suppliers, etc].

B. Document each request with complete data substantiating compliance of proposed Substitution with Contract Documents.

C. A request constitutes a representation that the Bidder:
   1. Has investigated proposed product and determined that it meets or exceeds quality level of specified product.
   2. Will provide same warranty for Substitution as for specified product.
   3. Will coordinate installation and make changes to other Work which may be required for the Work to be complete with no additional cost to Owner.
   4. Waives claims for additional costs or time extension which may subsequently become apparent.

D. Substitution Procedure
   1. **Submit copy of request for Substitution for consideration to Architect no later than seven [7] days before bid opening date**.
   2. Submit shop drawings, product data, and applicable certified test results attesting to proposed product equivalence. Burden on proof is on proposer.
   3. Architect will notify Contractor in writing of decision to accept or reject request within five [5] days of receipt of request or request additional information or documentation for evaluation.
   4. Limit each request to one proposed Substitution.
   5. Requests shall include the name of the material or equipment for which it is to be substituted and a completed description of the proposed substitution.
   6. Architect/Owner will notify Contractor in writing of decision to accept or reject request.
   7. Substitution requests shall only be submitted by registered bidders for the project.

E. Substitutions will not be considered when they are indicated or implied on Submittals, without written request or when acceptance will require revision to the Contract Documents.

F. If the Substitution requires modifications to the Contract / Bidding Documents, the cost for updating the documents shall be paid by the Contractor making the request.

G. Substitutions will not be considered after award of the project without justification.

H. Approved substitutions will be identified by Addenda.
   1. Bidders shall not rely upon approvals made in any other manner.

I. In submission of substitutions to Products specified, Bidders shall include in their Bid, changes required in the Work and Contract Price to accommodate such approved substitutions. Later claims by the Bidder for an addition to the Contract Time or Contract Price because of changes in Work necessitated by use of substitutions will not be considered.

END OF SECTION

SECTION 01 30 00 - ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Coordination and project conditions.

B. Construction Progress Schedules

C. Preconstruction meeting.

D. Progress meetings.

E. Pre-installation meetings.

F. Daily Job Logs.

G. Cutting and patching.

H. Special procedures.

1.2 COORDINATION AND PROJECT CONDITIONS

A. Coordinate scheduling, submittals, and Work of various sections of Project Manual / Specifications and Drawings to ensure efficient and orderly sequence of installation of interdependent construction elements.

B. Verify utility requirements and characteristics of operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, operating equipment.

C. Coordinate space requirements, supports, and installation of mechanical and electrical Work indicated diagrammatically on Drawings. Follow routing shown for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
   1. Coordination Drawings: Prepare as required to coordinate all portions of Work.
   2. Coordination Meetings: In addition to other meetings specified, hold coordination meetings with personnel and subcontractors to ensure coordination of Work.

D. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements. Coordinate rough in locations for accessibility, clearances, maneuvering, etc.

E. Coordinate completion and clean-up of Work of separate sections in preparation for Substantial Completion.

F. After Owner occupancy of premises, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

1.3 FIELD VERIFICATION

A. Prior to ordering materials, verify the actual dimensions of existing conditions and assume responsibility for workable solutions for all new work. Verification that new work and items are workable for existing conditions while providing adequate clearances is the responsibility of the Contractor.

1.4 CONSTRUCTION PROGRESS SCHEDULES

A. Illustrate order and interdependence of activities and sequence of work; how start of given activity depends on completion of preceding activities, and how completion of activity may restrain start of subsequent activities. Illustrate complete sequence of construction by activity.

Arrange schedule on a weekly basis identifying the first work day of each week. [Critical Path Schedule]

1. Work Sequences, order of operations, constraints, and milestones for the project, including all applicable Subcontract Work.
2. Material / equipment lead times.
3. Punchlist Activities
4. Substantial Completion and Contract Completion Dates.
5. Move-in and other preliminary activities.
6. Equipment and equipment system test and startup activities.
7. Project closeout and cleanup.

B. Submit initial progress schedule within seven [7] days after date of Owner-Contractor Agreement for Architect / Owner review.
   1. Include written certification that major subcontractors have reviewed and accepted proposed schedule.

C. Submit revised and updated schedules with each Application for Payment and as appropriate throughout the duration of the project.
   1. Indicate estimated percentage of completion for each item of Work at each submittal.

D. Review and Evaluation
   1. Participate in joint review and evaluation of schedules with Architect / Owner at each submittal.
   2. Evaluate Project status to determine Work behind schedule and Work ahead of schedule.
   3. Indicate changes required to maintain Date of Substantial Completion.
   4. After review, revise schedules incorporating results of review, and resubmit within three [3] days.

E. Distribute copies of updated schedules to Subcontractors, suppliers, Architect, Owner, and other concerned parties.

1.5 PRECONSTRUCTION MEETING

A. Architect / Owner will schedule preconstruction meeting after Notice of Award for affected parties.

B. Attendance: Architect, Owner, Contractor Project Manager, Foreman / Superintendent

C. Agenda:
   1. Execution of Owner-Contractor Agreement.
   2. Submission of executed bonds and insurance certificates.
   3. Distribution of Contract Documents.
   4. Submission of list of Subcontractors, list of products, schedule of values, and progress schedule.
   5. Designation of personnel representing parties in Contract, and Architect.
   6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
   7. Scheduling.
   8. Use of premises by Owner and Contractor.
   9. Owner requirements for procedures and inspections
   10. Construction facilities and controls provided by Owner.
   11. Security and housekeeping procedures.
   12. Application for payment procedures.
   13. Procedures for maintaining record documents.
   14. Requirements for start-up of equipment.
   15. Inspection and acceptance of equipment put into service during construction period.

D. Architect will record minutes and distribute copies via email after meeting to participants and those affected by decisions made.

1.6 PROGRESS MEETINGS

A. Architect will be providing periodic observation of the work. Architect will issue field reports at each site visit. Architects will be observing the work for compliance with the specifications and will not be responsible for the ways, means and methods of constructing the project or managing the day to day operations.

B. Schedule and administer meetings throughout progress of the Work at bi-weekly intervals.
   1. Provide suitable accommodations for holding meetings on-site with a layout table, chairs, etc.

C. Architect will make arrangements for meetings, prepare agenda with copies for participants, and preside at meetings.

D. Attendance Required: Job superintendent, major subcontractors and suppliers, Architect, Owner, as appropriate to agenda topics for each meeting.

E. Agenda:
   1. Review minutes of previous meetings.
   2. Review of Work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems impeding planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Review of off-site fabrication and delivery schedules.
   7. Maintenance of progress schedule.
   8. Corrective measures to regain projected schedules.
   9. Planned progress during succeeding work period.
   10. Coordination of projected progress.
   11. Maintenance of quality and work standards.
   12. Effect of proposed changes on progress schedule and coordination.
   13. Other business relating to Work.

F. Architect will record minutes and distribute copies via email after meeting to participants and those affected by decisions made.

1.7 PRE-INSTALLATION MEETINGS

A. Determine any and all necessary pre-installation meetings and schedule the same.

B. When required in individual specification sections, convene pre-installation meetings at Project site prior to commencing work of specific section.

C. Require attendance of parties directly affecting, or affected by, Work of specific section.

D. Notify Architect / Owner one week in advance of meeting date.

E. Prepare agenda and preside at meeting:
   1. Review conditions of installation, preparation and installation procedures.
   2. Review coordination with related work.

F. Record minutes and distribute to participants after meeting, and those affected by decisions made.

1.8 DAILY JOB LOGS

A. Maintain a daily job log that indicates the personnel on-site and activities performed (including all sub-contractors)

B. Indicate any safety concerns and incidents.

C. Indicate weather conditions.

D. Indicate any visitors or other personnel visiting the project site.

E. Job log shall be accessible to Architect / Owner upon request.

F. Coordinate activities / work progress with Architect / Owner.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

A. Employ skilled and experienced installer to perform cutting and patching; restore Work with new Products.

B. Submit written request in advance of cutting or altering elements affecting:
   1. Structural integrity of element.
   2. Integrity of weather-exposed or moisture-resistant elements.
   3. Efficiency, maintenance, or safety of element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate contractor.

C. Execute cutting, fitting, and patching [including excavation and fill,] to complete Work, and to:
   1. Fit the several parts together, to integrate with other Work.
   2. Uncover Work to install or correct ill-timed Work.
   3. Remove and replace defective and non-conforming Work.
   4. Remove samples of installed Work for testing.
   5. Provide openings in elements of Work for penetrations of mechanical and electrical Work.

D. Execute work by methods to avoid damage to other Work, and to provide proper surfaces to receive patching and finishing.

E. Cut masonry and concrete materials using masonry saw or core drill.

F. Restore Work with new products in accordance with requirements of Contract Documents.

G. Fit Work tight to adjacent elements. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

H. Fit Work tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. Maintain integrity of wall, ceiling, or floor construction; completely seal voids.

J. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated materials, to full thickness of penetrated element. Follow applicable UL assemblies.

K. Refinish surfaces to match adjacent finishes.
   1. For continuous surfaces, refinish to nearest intersection; for assembly, refinish entire unit.
   2. For painted surfaces, paint entire wall from corner to corner, floor to ceiling.

L. Identify hazardous substances or conditions exposed during the Work to Architect for decision or remedy.

3.2 SPECIAL PROCEDURES

A. Materials: As specified in product sections; match existing with new products for patching and extending work.

B. Employ skilled and experienced installer to perform alteration work.

C. Cut, move, or remove items as necessary for access to alterations and renovation Work. Replace and restore at completion.

D. Remove unsuitable material not marked for salvage, including rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to permit installation of new work and finishes.

G. Remove, cut, and patch Work in manner to minimize damage and to permit restoring products and finishes to original or specified condition.

H. Refinish existing visible surfaces to remain in renovated rooms and spaces, to renewed condition for each material, with neat transition to adjacent finishes.

I. Where new Work abuts or aligns with existing, provide smooth and even transition. Patch Work to match existing adjacent Work in texture and appearance.

J. When finished surfaces are cut so that smooth transition with new Work is not possible, terminate existing surface along straight line at natural line of division and submit recommendation to Architect for review.

K. Patch or replace portions of existing surfaces which are damaged, lifted, discolored, or showing other imperfections.

L. Finish surfaces as specified in individual product sections.

END OF SECTION

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SECTION 01 33 00 - SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Submittal procedures.

B. Proposed products list.

C. Product data.

D. Shop drawings.

E. Samples.

F. Safety Data Sheets

G. Manufacturer's Instructions

H. Manufacturer's Certificates

I. Construction Photographs

1.2 SUBMITTAL PROCEDURES

A. Submit product data and shop drawings for all applicable components of the project. Refer to individual sections for additional requirements.
   1. Provide a submittal log at the beginning of the project for review by Architect / Owner. Identify proposed submittals by Spec Section.
   2. Architect / Owner review of the submittals will be general in nature and does not relieve the Contractor in any way of the responsibility in compliance with the contract requirements, manufacturer requirements, and/or applicable codes.

B. Accomplish all submittals in a digital [PDF format].
   1. Any hard copies received will be scanned and returned electronically.
   2. Provide those submittals required to maintain orderly progress of the work and those required for early lead time for manufacturer fabrication.
   3. Do not simply download information directly from a manufacturer’s website without a review of the information and **identifying the particular products being utilized**.
   4. Mark each component to identify applicable products, models, options, and other data. Supplement manufacturer’s standard data to provide information unique to this project. Non-identified submittals will be rejected.

C. Provide a Submittal form / cover sheet to identify Project, Contractor, subcontractor or supplier; and pertinent Contract Document references.
   1. Allow space on submittal form / cover sheet for Contractor and Architect review stamps.
   2. Sequentially number transmittal forms.
   3. Mark revised submittals with original number and sequential alphabetic suffix.
   4. Sign off on submittals indicating Contractor review of the data provided.

D. Apply Contractor's stamp, signed or initialed, certifying that review, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with requirements of the Work and Contract Documents.

E. Identify variations from Contract Documents and Product or system limitations which may be detrimental to successful performance of completed Work.

F. Revise and resubmit submittals as required; identify changes made since previous submittal.

G. Schedule / complete all submittals at the beginning of the project / with adequate time to allow the proper ordering of materials for the project.

1. Failure by the Contractor to provide submittals in a timely fashion does not change the project start date nor contract period.
2. Failure by the Contractor to order materials timely is not a reason for selection of an alternate material.

H. Any materials on the job site that have not been reviewed as part of the submittal process are subject to rejection / removal from the job-site. Any work undertaken without review of the submittal data is at the Contractor's risk and subject to rejection or replacement at no cost to the Owner if submittals are not in conformance with the project documents.

I. For each submittal for review, allow seven [7] days excluding delivery time to and from Contractor.

J. Architect will return the annotated submittal file via email as PDF electronic files.

K. Submittals will be marked as follows:
1. NO EXCEPTIONS TAKEN: Distribute copies to subcontractors and related trades.
2. NOTE MARKINGS: Final Release; Proceed with fabrication, taking into account the necessary corrections on submittal and with Contract Documents.
3. NOTE MARKINGS/RESUBMIT: Proceed with fabrication, taking into account the necessary corrections. Resubmit corrected shop drawings before fabrication of this work is complete to obtain a different action marking. Do not allow drawings marked "Resubmit" to be used in connection with installation of the Work.
4. REJECTED: Resubmit shop drawings in their entirety. No fabrication or installation shall be started until shop drawings so marked have been completely revised, resubmitted, and marked by Architect according to preceding Paragraphs.

L. Distribute copies of reviewed submittals as appropriate [electronically as appropriate]. Instruct parties to promptly report inability to comply with requirements.

1.3 PROPOSED PRODUCTS LIST

A. Within fourteen [14] days after date of Notice to Proceed, submit list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.

1.4 SUBMITTALS / PRODUCT DATA / SHOP DRAWINGS

A. Product Data/Shop Drawings:
1. Submitted to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
2. All shop drawings shall be to scale, submit drawings on sheets no larger than 24-inch x 36 inch, all other product data can be on 8 ½ X 11-inch sheets.

B. Samples for Review:
1. Submitted to Architect for review and selection for aesthetic, color, or finish.
2. Submit samples of finishes from full range of manufacturer's standard colors, textures, and patterns for Owners selection.
3. Submit samples to illustrate functional and aesthetic characteristics of Product.

C. Personnel/Other Contractors
1. Submit a list of all subcontractors and on-site personnel with the list of lead contact and associated phone numbers.
2. Submit emergency contact sheet with contacts for an emergency – 24/7 call list.

D. Contract Items:

1. Submit Certificate of Insurance, Worker's Comp Certificates as required by Owner.
2. Submit bonds if applicable to the contract.
3. Submit a written Construction Schedule / Implementation and Sequencing Plan outlining starting points and length of time to complete work in each section.

E. Site Specific Safety Plan
   1. Provide to Owner for their Review.

F. Site Logistics Plan
   1. Provide to Owner for their Review.

1.5 SAMPLES

A. Physical Samples: Submit to Architect for review for limited purpose of checking for conformance with information given and design concept expressed in Contract Documents.
   1. Physical samples are required to allow Architect to make selections for color and finish. Electronic images of colors/finishes, etc. are not sufficient.

B. Samples For Selection as Specified in Product Sections:
   1. Submit to Architect for aesthetic, color, or finish selection.
   2. Submit samples of finishes from full range of manufacturers' standard colors, textures, and patterns for Architect selection.

C. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.

D. Include identification on each sample, with full Project information.

E. Submit 2 copies of each sample, Architect will retain 1 copy.

F. Reviewed samples which may be used in the Work are indicated in individual specification sections.

1.6 SAFETY DATA SHEETS

A. Submit Safety Data Sheets [SDS] on all products directly to the Owner – DO NOT submit to Architect.
   1. Safety Data Sheets [SDS] shall not be submitted to the Architect for review.
   2. Any SDS submitted to Architect will be returned with no action taken. Architect does not review / approve any SDS sheets. Any submittals provided to Architect with SDS will be rejected, or have the SDS removed / crossed out from the submittal.

B. Safety Data Sheets relate directly to construction safety, which is the sole responsibility of the Contractor.

C. In compliance with the OSHA Hazard Communication Standard (1910.1200, 08-24-1987), Post at the site SDS [Safety Data Sheets] for ALL products classified as hazardous that their firm has knowledge that they will be furnishing, using, or storing on the jobsite during the duration of this Project in accordance with OSHA standards.

1.7 MANUFACTURER'S INSTRUCTIONS

A. When specified in individual specification sections, submit manufacturer printed instructions for delivery, storage, assembly, installation, [start-up,] adjusting, and finishing, in quantities specified for Product Data.

B. Indicate special procedures, conditions requiring special attention, and special environmental criteria required for application or installation.

1.8 MANUFACTURER'S CERTIFICATES

A. When specified in individual specification sections, submit certifications by manufacturer to Owner, in quantities specified for Product Data.

B. Indicate material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.

C. Certificates may be recent or previous test results on material or Products, but must be acceptable to Architect / Owner.

1.9 CONSTRUCTION PHOTOGRAPHS

A. Provide digital photographs of construction throughout progress of Work as taken by project superintendent as applicable to document the existing conditions, work in progress, completed work, project wrap up, etc. It is in the best interest of the contractor to document the conditions as this is an occupied unit project.

B. Deliver photographs to Architect / Owner upon request. Catalog and index in chronological sequence with date indexed.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 ELECTRONIC CAD FILES OF PROJECT DRAWINGS

A. Electronic CAD Files of Project Drawings: May only be used to expedite production of Submittal / Shop Drawings for the Project. Use for other Projects or purposes is not allowed.

B. Electronic CAD Files of Project Drawings: Distributed only under the following conditions:
   1. Use of files is solely at receiver's risk. Architect does not warrant accuracy of files. Receiving files in electronic form does not relieve receiver of responsibilities for measurements, dimensions, and quantities set forth in Contract Documents. In the event of ambiguity, discrepancy, or conflict between information on electronic media and that in Contract Documents, notify Architect of discrepancy and use information in hard-copy Drawings and Specifications.
   2. CAD files do not necessarily represent the latest Contract Documents, existing conditions, and as-built conditions. Receiver is responsible for determining and complying with these conditions and for incorporating addenda and modifications.
   3. User is responsible for removing information not normally provided on Shop Drawings and removing references to Contract Documents. Shop Drawings submitted with information associated with other trades or with references to Contract Documents will not be reviewed and will be immediately returned.
   4. Receiver shall not hold Architect responsible for data or file clean-up required to make files usable, nor for error or malfunction in translation, interpretation, or use of this electronic information.
   5. Receiver shall understand that even though Architect has computer virus scanning software to detect presence of computer viruses, there is no guarantee that computer viruses are not present in files or in electronic media.
   6. Receiver shall not hold Architect responsible for such viruses or their consequences, and shall hold Architect harmless against costs, losses, or damage caused by presence of computer virus in files or media.
   7. Architect reserves the right to assess a fee for the release of the electronic CAD files. Coordinate with Architect as appropriate.

END OF SECTION

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SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Quality control.

B. Construction Procedures

C. Tolerances

D. References.

E. Labeling

F. Mock-up requirements.

G. Examination & Inspection.

H. Testing and Inspection Services [Special Inspections]

1.2 QUALITY CONTROL

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. When manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform Work by persons qualified to produce required and specified quality.

F. Verify field measurements are as indicated on Shop Drawings or as instructed by manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, or disfigurement.

1.3 CONSTRUCTION PROCEDURES

A. Architect / Owner intends to routinely monitor the Contractor’s work and progress. Quality control is an important element which is the responsibility of the Contractor. Provide full cooperation with all inspection steps through the construction process and include such coordination in the base bid of the project.

B. Provide accessibility to the work, including but not limited to ladders, scaffolding, hoisting, etc in order to make all areas of the work available to Architect / Owner. Provide staffing to support these operations.

C. Inspect the Work prior to requesting a punchlist inspection. Address / correct any deficiencies and provide written confirmation of such with the request to schedule the punchlist inspection by the Architect / Owner. Refer to Section 01 77 00.

D. Owner will coordinate and schedule an anniversary inspection for the one year interval following acceptance of the project.

1.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. When manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.5 REFERENCES

A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. When specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

E. Neither contractual relationships, duties, nor responsibilities of parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in reference documents.

1.6 LABELING

A. Attach label from agency approved by Authority having Jurisdiction for products, assemblies, and systems required to be labeled by Applicable Code.

B. Label information: include manufacturer’s or fabricator’s identification, approved agency information, and the following information, as applicable, on each label.
   1. Model number
   2. Serial number
   3. Performance characteristics

C. Manufacturer's Nameplates, Trademarks, Logos, and Other Identifying Marks on Products: Not allowed on surfaces exposed to view in public areas, interior or exterior.

1.7 MOCK-UP REQUIREMENTS

A. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes as directed by Architect / Owner.

B. Accepted mock-ups shall be comparison standard for remaining Work follow requirements of individual sections.

C. Where mock-up has been accepted by Architect / Owner and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.8 TESTING AND INSPECTION SERVICES [SPECIAL INSPECTIONS]

A. Owner will employ and pay for specified services of on an independent firm to accomplish Third Party Special Inspections as outlined on the Drawings.

B. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify independent firm **24** hours before expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional Samples and tests required for Contractor's use.

C. Employment of testing agency or laboratory shall not relieve Contractor of obligation to perform Work according to requirements of Contract Documents.

D. Retesting or re-inspection required because of nonconformance with specified or indicated requirements shall be performed by same independent firm on instructions from Architect. Payment for retesting or re-inspection will be charged to Contractor by deducting testing charges from Contract Sum.

E. Agency Reports: After each test, promptly submit an electronic copy of report to Architect, Contractor, and Owner. When requested by Architect, provide interpretation of test results.

F. Limits on Testing Authority:
   1. Agency or laboratory may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency or laboratory may not approve or accept any portion of the Work.
   3. Agency or laboratory may not assume duties of Contractor.
   4. Agency or laboratory has no authority to stop the Work.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. Beginning new Work means acceptance of existing conditions.

B. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Verify utility services are available, of correct characteristics, and in correct locations.

E. Contact Utility Protection Services [Call 811] a minimum of 48 hours prior to beginning work to verify location of existing utilities, coordinate requirements as applicable.
   1. Contact private utility locating services as required by the conditions. Locate all public and private utilities that may be impacted by the work.

3.2 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

END OF SECTION

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SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Temporary Utilities

B. Construction Facilities

C. Temporary Controls

D. Removal of utilities, facilities, and controls

1.2 TEMPORARY ELECTRICITY

A. Utilize existing utilities at the building as required to facilitate work. Owner will pay for the cost of electricity. Maintain existing utilities operational throughout the duration of the project. If systems need to be out of service, schedule this work for off-hours, coordinate with Owner. DO NOT use Resident utilities.

B. Supplement with portable generators as necessary to perform work. Pay for use of generators and energy consumed.

1.3 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide temporary lighting for construction operations as required by conditions and where existing lighting has been removed to facilitate work.

1.4 TEMPORARY HEATING / COOLING / VENTILATION

A. Provide temporary heating / cooling to facilitate the project. Owner will pay for the cost to maintain temporary heating / cooling. Existing systems may remain in place until new systems are installed to the extent feasible.

B. Provide winter time heating / additional protection as required to facilitate work.

C. Shut down HVAC systems during dusty activities. Provide and maintain filtration media at all HVAC systems.

D. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

E. Provide temporary fan units as required to maintain clean air for construction operations.

1.5 TEMPORARY WATER SERVICE

A. Connect to existing water source for construction operations. Owner will pay for cost of water used.

B. Extend branch piping with outlets located so water is available by hoses with threaded connections.

1.6 TEMPORARY PROTECTION OF FIRE SPRINKLER / FIRE ALARM SYSTEMS

A. Coordinate with fire sprinkler system and fire alarm system / monitoring company to maintain systems operational. This includes temporary protection and coordination of monitoring company to put system in test mode as applicable to the work.
   1. Provide and maintain a proper fire watch within the building at any time when systems are in test mode.

1.7 TEMPORARY SANITARY FACILITIES

A. Provide temporary sanitary facilities for use during construction. Maintain daily in clean and sanitary condition.
   1. Do not use building toilet facilities for temporary facilities unless specifically authorized.
   2. Do not use new plumbing fixtures for temporary facilities.
   3. Do not use other Owner facilities without explicit approval.
   4. Protect temporary facilities from vandalism.

B. Provide potable drinking water for workers.

1.8 TEMPORARY BARRICADES

A. Erect temporary barricades as applicable to the work to maintain security, dust control, protect residents, etc.

B. Provide additional barricades, barriers, or protection necessary to protect work areas at traffic lanes, parking lots, etc.

C. Provide all applicable signage to limit non-construction personnel from entering the construction area.

D. Provide temporary emergency egress and exit signage as required by conditions and where existing has been temporarily removed to facilitate work.

1.9 STAGING AREA / MATERIAL STORAGE

A. Coordinate with Owner on acceptable location of project staging and material storage area.

B. Do not anticipate any space for storage of materials in the building / work areas or adjacent building areas.

C. Provide secured, portable storage containers for temporary / construction storage as required by the Contractor.
   1. Do not anticipate any space for storage of materials in the building / work areas or adjacent building areas.
   2. Coordinate location of storage containers with Owner.
   3. Protect / restore site as applicable to the conditions to original conditions.

D. Owner will make reasonable effort to provide suitable space on the site for the Contractor to set up operations. Moving from this space may be necessary when instructed by the Owner and shall be accomplished without charge to the Owner. Cooperate with Owner to minimize conflict from Owner's operations.

1.10 FIELD OFFICE

A. Provide securable on-site space for storage as required by the Contractor. Coordinate with Owner for approved location of such storage space.

B. Provide field office for construction operations as deemed necessary by Contractor. Pay for field offices and related expenses.

1.11 VEHICULAR ACCESS

A. Utilize existing street parking / driveways / parking areas for construction activities. Do not block or prohibit vehicular access to adjacent buildings / parking areas. Do not allow driving/parking in turf areas.

B. Provide unimpeded access for emergency vehicles. Maintain 20 feet wide driveways with turning space between and around combustible materials.

C. Provide and maintain access to fire hydrants and control valves free of obstructions.

1.12 CONSTRUCTION ACCESS DRIVE

A. Not Applicable.

1.13 PARKING

A. Park Contractor vehicles in areas designated by the Owner. Construct temporary gravel parking areas as necessary to accommodate construction personnel.

B. Use of designated existing on-site driveways, parking areas, and / or street parking used for construction traffic is permitted. Tracked vehicles not allowed on paved areas.
   1. Do not block access to existing parking lots, driveways, etc. with construction equipment, material laydown, or storage areas.
   2. Do not block resident vehicles or those of adjacent buildings with a shared driveway.

C. Do not allow heavy vehicles or construction equipment in parking areas.

D. Maintenance:
   1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
   2. Maintain existing and permanent paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

E. Removal, Repair:
   1. Repair existing and permanent facilities damaged by use, to original or specified condition.

1.14 PROGRESS CLEANING AND WASTE REMOVAL

A. Collect and maintain areas free of waste materials, debris, and rubbish. Maintain site in clean and orderly condition to the satisfaction of the Owner. Clean up shall occur on a DAILY basis.
   1. Failure to provide routine and daily cleanup may result in a back charge from the Owner to accomplish this work.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site daily and dispose off-site. Sort and recycle as applicable.

E. Provide dumpsters or trash containers needed for the proper removal of project materials, trash, or debris related to the work. Keep all work areas and project sites neat and free of trash and clutter at all times. Project site consists of occupied apartment units. Do not leave trash around the project site. Take all considerations necessary for safety.

1.15 PROTECTION OF INSTALLED WORK

A. Protect installed Work and provide special protection where specified in individual specification sections. Restore any damaged work to new condition.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Protect finished pavement, concrete, stairs, finish flooring, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

D. Prohibit traffic or storage upon waterproofed or roofed surfaces, finished surfaces, etc as is applicable to the work. When traffic or activity is necessary, obtain recommendations for

protection from the material manufacturer and provide all required protection as determined necessary. Any damage caused shall be repaired to like new condition.

E. Prohibit traffic from landscaped areas.

1.16 FIRE PREVENTION FACILITIES

A. Prohibit smoking within building or on site under construction. **NO SMOKING IS PERMITTED ON HUD PROPERTY [INTERIOR OR EXTERIOR]. NO EXCEPTIONS.**
   1. Contractor / Crew found to be smoking will be subject to a $500 fine per occurrence. Any habitual offenders will be dismissed from the project.

B. Establish fire watch for cutting and welding and other hazardous operations capable of starting fires. Maintain fire watch before, during, and after hazardous operations until threat of fire does not exist.

C. Portable Fire Extinguishers: NFPA 10; 10 pound capacity, 4A-60B: C UL rating.
   1. Provide one fire extinguisher at each building under construction.
   2. Provide minimum one fire extinguisher in storage shed.
   3. Supplement as necessary per the local fire department requirements for construction operations.

1.17 BARRIERS

A. Provide barriers [construction fencing] to prevent unauthorized entry to construction areas.

B. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

C. Protect Work existing premises from theft, vandalism, and unauthorized entry.

1.18 SECURITY

A. Security Program:
   1. Protect Work and existing premises from theft, vandalism, and unauthorized entry.
   2. Maintain program throughout construction period until Owner occupancy

B. Entry Control:
   1. Restrict entrance of persons into Project site.
   2. Allow entrance only to authorized persons with proper identification.
   3. Maintain log of workers and visitors, make available to Owner on request.

1.19 DAILY JOB LOGS

A. Maintain a daily job log that indicates the personnel on-site and activities performed (including all sub-contractors)

B. Indicate any safety concerns and incidents.

C. Indicate weather conditions.

D. Indicate any visitors or other personnel visiting the project site.

E. Job log shall be accessible to Owner and Architect upon request.

1.20 DUST CONTROL

A. Execute work by methods to minimize raising dust from Construction operations.

B. Provide positive means to prevent air-borne dust from dispensing into atmosphere and to other areas of the project as applicable.

C. Provide temporary visqueen dust control measures to minimize the spread of dust and debris. Provide drop cloths, protective coverings as necessary.

D. Provide protection of existing HVAC / distribution systems.

1.21 POLLUTION AND ENVIRONMENTAL CONTROL

A. Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations.

B. Provide dust control, erosion and sediment control, etc. to allow for proper execution of the Work.

C. Provide protective coverings, etc. as necessary to protect work.

1.22 EROSION AND SEDIMENT CONTROL

A. Not Applicable.

1.23 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove existing utilities, connections, finishes, etc. as applicable to the work. Remove back to the nearest termination, junction box, etc. as applicable to the work. Coordinate with requirements on the drawings.

B. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing and permanent facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

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SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Product requirements.

B. Product options and substitution procedures.

C. Equipment electrical characteristics and components.

1.2 PRODUCTS

A. Products: Means new material, machinery, components, equipment, fixtures, and systems forming the Work, but does not include machinery and equipment used for preparation, fabrication, conveying and erection of the Work.
   1. All products used on this project shall be new, unless otherwise noted on the drawings or as specified herein as salvaged or reused.

B. Do not use materials and equipment removed from existing premises, except as specifically identified or allowed by the Contract Documents.

C. Provide interchangeable components of same manufacturer for components being replaced.

D. Furnish products of qualified manufacturers suitable for intended use. Furnish products of each type by single manufacturer unless specified otherwise.

E. Do not use materials and equipment removed from existing premises, except as specifically permitted by Contract Documents.

F. Furnish interchangeable components from same manufacturer for components being replaced.

G. **Order Products in the first 30 days of the contract**. **Provide documentation of orders upon request.**

H. **It shall be solely the Contractor's responsibility to order products to allow timely delivery for installation. The failure to order materials early in the project shall not be a reason for a contract time extension or additional costs related to expedited shipping and/or delivery. Nor shall this be a reason for a product substitution.**

1.3 BUILD AMERICA, BUY AMERICA [BABA] REQUIREMENTS

A. BABA is the Build America, Buy America Act. BABA requires any "infrastructure project" funded by any "Federal Financial Assistance" (FFA) apply a domestic content procurement preference, meaning that all iron, steel, manufactured products, and construction materials used in the infrastructure project have been produced in the United States, unless the awarding agency has issued a waiver of this requirement. This is called the "Buy American Preference" (BAP)

B. HUD Hyperlink: https://www.hud.gov/program_offices/general_counsel/build_america_buy_america

C. BAP is not applicable to projects less than $250,000.

1.4 LABELING

A. Attach label from agency approved by authority having jurisdiction for products, assemblies, and systems required to be labeled by applicable code.

B. Label Information: Include manufacturer's or fabricator's identification, approved agency identification, and the following information, as applicable, on each label.
   1. Model number.

2. Serial number.
3. Performance characteristics.

1.5 PRODUCT DELIVERY REQUIREMENTS

A. Transport and handle products in accordance with manufacturer's instructions.

B. Promptly inspect shipments to ensure products comply with requirements, quantities are correct, and products are undamaged.

C. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage.

D. Coordinate material delivery to minimize Owner involvement.

1.6 PRODUCT STORAGE AND HANDLING REQUIREMENTS

A. Store and protect products in accordance with manufacturers' instructions.
   1. Remove any damaged materials from the site.

B. Store with seals and labels intact and legible.

C. Store sensitive products in weather tight, climate controlled, enclosures in an environment favorable to product.

D. For exterior storage of fabricated products, place on sloped supports above ground.

E. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

F. Store loose granular materials on solid flat surfaces in well-drained area. Prevent mixing with foreign matter.

G. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

H. Secure all products to prevent blow off / blow over during weather events, wind, etc.

I. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

1.7 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Any Product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Products of manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with Provision for Substitutions / Approved Equal: Submit request for substitution as outlined in this section for manufacturers not named.
   1. Architect / Owner is the decision maker if the proposed “approved equal” is in fact equal and approved. Any decision rendered is final.
   2. Any Contractor, Sub-contractor, or Supplier who makes their own judgement as to “approved equal” and includes within their bid without a formal approval is doing so at their own risk.

1.8 PRODUCT SUBSTITUTION PROCEDURES – REFER TO SECTION 01 25 00

PART 2 PRODUCTS

2.1 EXTRA MATERIALS

A. Provide attic stock of finish materials totaling 5% [or as noted herein] of the total installation.

B. Provide minimum of [1] gallon of each finish paint color.

C. Coordinate turnover of extra materials to Owner, assist in placing materials in a location suitable to the Owner.

2.2 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Owner and place in location as directed; obtain receipt prior to final payment. Items shall be boxed and labeled with contents.

2.3 EQUIPMENT ELECTRICAL CHARACTERISTICS AND COMPONENTS

A. Wiring Terminations: Furnish terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated. Include lugs for terminal box.

B. Cord and Plug: Furnish minimum 6 foot cord and plug including grounding connector for connection to electric wiring system. Cord of longer length is specified in individual specification sections.

2.4 TOLERANCES

A. Monitor fabrication and installation tolerance control of installed Products over suppliers, manufacturers, Products, site conditions, and workmanship, to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply fully with manufacturer’s tolerances.

C. Adjust products to appropriate conditions. Position before securing products in place.

PART 3 EXECUTION

Not Used.

END OF SECTION

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SECTION 01 73 00 - EXECUTION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Construction Safety / Safety Program

B. Construction Layout

C. General Installation of Products

D. Starting of Systems

E. Demonstration and Training

F. Removals and Cleanup

G. Protection of Installed Construction

1.2 QUALITY ASSURANCE

A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.

B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that are similar to those indicated for this project in material, design, and extent.

C. Manufacturer’s Installation Instructions: Obtain and maintain on-site manufacturers written recommendations and instructions for installation of products and equipment.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing site conditions and substrate surfaces are acceptable for subsequent Work. **Beginning new Work means acceptance of existing/job-site conditions.**

B. Existing Conditions: The existence and location of site improvements, utilities, and other construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of mechanical and electrical systems and other construction affecting the Work.

C. Existing Utilities: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities and other construction affecting the Work.

1. Verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water service piping.
2. Verify the location of underground electrical services, natural gas piping and other utilities.
3. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

D. Contact OUPS a minimum of 48 hours prior to beginning work to verify location of existing utilities, coordinate requirements as applicable.
   1. Contact private utility locating services as required by the conditions. It is the Contractor's responsibility to locate all public and private utilities that may be impacted by the work.

E. Verify existing substrate is capable of structural support or attachment of new Work being applied or attached.

F. Examine and verify specific conditions described in individual specification sections.

3.2 PREPARATION

A. Existing Utility Information: Furnish information to Architect / Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a RFI request to Architect. Include a detailed description of problem encountered, together with recommendations for changing the Contract Documents.

E. Clean substrate surfaces prior to applying next material or substance.

F. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying new material or substance in contact or bond.

3.3 FIELD VERIFICATION

A. Prior to ordering materials, Contractor shall verify the actual dimensions of existing conditions and assume responsibility for workable solutions for all new work. Verification that the new work and items are workable for existing conditions while providing adequate clearances is the responsibility of the Contractor.

3.4 CONSTRUCTION SAFETY / SAFETY PROGRAM

A. Develop, implement, and maintain a written safety program for all operations/ work performed on this project. Keep these documents at the job site and make available to the Architect / Owner upon request.

B. Assume all responsibility for project safety, ways, and means and methods of constructing the project. Engage safety consultant as may be necessary for the execution of the work.

C. In addition, the Owner may require special safety requirements to be performed by the Contractor, these requirements will be provided prior to commencement of work.

3.5 CONSTRUCTION LAYOUT

A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Architect / Owner promptly.
   1. Locate and protect existing benchmarks and control points. Preserve permanent reference points during construction. Do not change or relocate benchmarks or control

points without prior written approval. Promptly report lost or destroyed reference points or requirements to relocate reference points because of necessary changes in grades or locations.

2. Promptly replace lost or destroyed project control points. Base replacements on the original survey control points.

B. General: Engage a land surveyor or professional engineer to lay out the Work using accepted surveying practices.
   1. Establish permanent benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
   2. Verify setbacks and esasements.
   3. Establish limits on use of Project Site.
   4. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
   5. Inform installers of lines and levels to which they must comply.
   6. Check the location, level and plumb, of every major element as the Work progresses.
   7. Notify Architect / Owner when deviations from required lines and levels exceed allowable tolerances.
   8. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and invert elevations.

C. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.

3.6 INSTALLATION, GENERAL

A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
   1. Make vertical work plumb and make horizontal work level.
   2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
   3. Conceal pipes, ducts, and wiring in finished areas, unless otherwise indicated.
   4. Maintain minimum headroom clearance, coordinate with Architect.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Contract Completion.

D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.

E. Sequence the work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.

F. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.

G. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
   1. Mounting Heights: Coordinate with Architect as applicable.
   2. Allow for building movement, including thermal expansion and contraction.

3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
4. Electrical wiring and associated metallic conduit shall not be embedded within roof assemblies or placed directly below roof decks. Electrical wiring or metallic conduit located near roof assemblies shall be positioned and supported at least 10 inches away from the bottom side of the metal roof deck or other substrate to which a roof system has been or will be applied.
5. Suspension wires, straps, chains, and metal framing such as those used to support the following shall not be attached to or through steel roof decks.
    a. Bulkheads.
    b. Suspended ceilings.
    c. Fire-suppression systems.
    d. Ductwork.
    e. Lighting.
    f. Similar items.

H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

3.7 PROTECTION

A. Accomplish all work in accordance with the provision of Federal, State American Standard Safety Code for Building Construction and OHSA safety requirements.
    1. Provide all aspects of project safety including protective railings and guards, tie-offs, fall protection, and other safety measures as required by OSHA, even if not specified. Fall protection is required. Architect is not a safety consultant and as such does not direct the means and methods of compliance with safety regulations.

B. Protect and maintain all building entrances, interior contents, building exterior and grounds.
    1. Return all surfaces to their original condition after all work is complete.

C. Replace / Repair any damages [including interior or exterior equipment / finishes] at no expense to the Owner in the event of damages of any kind caused by improper protection.

D. Comply with all regulations of the Local Fire Department and the Owner's requirement regarding storage and handling of flammable materials, etc. Comply with the safety provisions of the National Fire Code pertaining to such hot work. Contractor is responsible for all damage or fines resulting from failure to comply.

3.8 STARTING OF SYSTEMS

A. Coordinate schedule for startup of various equipment and systems.

B. Notify Architect / Owner seven [7] days prior to startup of each item.

C. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

D. Verify tests, meter readings, and specified electrical characteristics agree with those required by equipment or system manufacturer.

E. Verify wiring and support components for equipment are complete and tested.

F. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

G. Adjust operating components for proper operation to ensure smooth and unhindered operation in accordance with manufacturer requirements.

H. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.9 TESTING, ADJUSTING, AND BALANCING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.10 DEMONSTRATION AND TRAINING

A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

C. Demonstrate start-up, operation, control, adjustment, trouble-shooting, servicing, maintenance, and shutdown of each item of equipment at scheduled times, at equipment location.

D. Utilize operation and maintenance manuals as basis for instruction. Review contents of manual with Owner’s personnel in detail to explain all aspects of operation and maintenance.
   1. Prepare and insert additional data into the operations and maintenance manuals when the need for additional data becomes apparent during instruction.

3.11 REMOVALS AND CLEANUP

A. Remove and demolish items that are required for proper completion of the work as applicable in each section. All debris resulting from the work not designated for reuse becomes the property of the Contractor unless stated otherwise.

B. Keep all work areas and project sites neat and free of trash and clutter at all times.

C. Maintain the work areas, including all subcontractor’s work, clean of all debris to the satisfaction of the Owner at the completion of each work day [daily cleanup].

D. Provide dumpsters or trash containers needed for the proper removal of project materials, trash, or debris related to the work.
   1. No Debris, materials, etc. may be left unprotected on the grounds.
   2. All exterior staging / dumpster areas must be fenced / protected.

3.12 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Contract Completion.

B. Comply with manufacturer's written instructions for temperature and relative humidity.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished pavement, concrete, floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces, finished surfaces, etc as is applicable to the work. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer and provide all required protection as determined necessary. Any damage caused shall be repaired to like new condition.

G. Prohibit traffic from landscaped areas.

3.13 CORRECTION OF WORK

A. Repair or remove and replace damaged, defective, or nonconforming work. Restore damaged substrates and finishes.
   1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with watching materials, and properly adjusting operating equipment.

B. Repair work previously completed and subsequently damaged during construction period. Repair to like-new condition.

C. Restore permanent facilities used during construction to their specified condition.

D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.

E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.

F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION

SECTION 01 77 00 - CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 WORK INCLUDES

A. Punchlist Requirements

B. Substantial Completion

C. Final Contract Completion

D. Project Record Documents

E. Warranties

F. Final Cleaning

G. Repair of Work

1.2 PUNCHLIST REQUIREMENTS

A. Review and inspect all Work prior to notifying Architect / Owner for a Punchlist inspection of the work.
   1. Provide seven [7] day notice prior to work being complete to establish desired inspection date. Architect / Owner will either proceed with the inspection or notify Contractor of unfulfilled requirements.
   2. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for punch list inspection.

B. Architect / Owner will inspect the completed project and notify the Contractor of any deficiencies. Deficiencies will form 'punch list' for final acceptance.

C. If work is clearly not complete, the Punchlist will be suspended until such time that it is evident that the Contractor has completed and reviewed / inspected their own work.
   1. Architect anticipates [1] punchlist inspection and [1] back-punch / final inspection as part of services to the Owner.
   2. Failures by the Contractor to complete the work, complete punchlists, etc. may result in a backcharge to the Contractor for the additional time to closeout the project.

D. Review and provide the noted repairs and corrective work necessary at each of the Punchlist inspections to allow project close out.
   1. Back-punch walk through may result in additional punchlist items which need to be addressed by the Contractor.

E. Provide / allow adequate time in the construction schedule to accomplish punchout work within the overall contract period indicated within the bid documents.

F. The failure to identify any punchlist item during a walk through / inspection does not release the Contractor from contractual responsibility to address any item during the warranty period.

1.3 SUBSTANTIAL COMPLETION

A. A Certificate of Substantial Completion [AIA Form G704] will be issued upon completion of all the work. Certificate of Substantial Completion will set forth the date of warranty commencement, work yet to be completed, timeline for completion of that incomplete work, and value of that incomplete work.

1.4 FINAL CONTRACT COMPLETION

A. Provide the following items to the Owner prior to acceptance and final payment
   1. Evidence that any open claims or disputes are resolved.

2. Notarized affidavit of waiver of liens [contractor of record], sub-contractors and material suppliers
3. Final Permit approval / inspection / Certificate of Occupancy from authorities having jurisdiction
4. Final Application for Payment.
   a. Submit a final Application for Payment according to Section 01 29 00, Payment Procedures.
5. Documented evidence of completing 'punch list' as applicable.
6. Manufacturer's original warranties, including contractor maintenance agreements and warranties as applicable.
7. O+M Manuals
8. Manufacturer's maintenance and repair instructions.
9. As-Built / Record Drawings.
10. Final cleaning.
11. Restore all work staging and lay-out areas to pre-construction conditions, including but not limited to, removal of debris, temporary facilities, grading and grass seeding and cleaning or repair of impacted structures.

1.5 PHOTOGRAPHIC DOCUMENTATION

A. When requested by the Owner, photos of the completed punch list along with any supporting documentation can be submitted, in lieu of a final walkthrough.

1.6 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Construction Bulletins / Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
   1. Manufacturer's name and product model and number.
   2. Product substitutions or alternates utilized.
   3. Changes made by Addenda and modifications.

F. Record Drawings: Legibly mark each item to record actual construction as follows:
   1. Include Contract modifications such as Addenda, supplementary instructions, change directives, field orders, minor changes in the Work, and change orders.
   2. Include locations of concealed elements of the Work.
   3. Identify depth of buried utility lines and provide dimensions showing distances from permanent facility components that are parallel to utilities.
   4. Dimension ends, corners, and junctions of buried utilities to permanent facility components using triangulation.
   5. Identify and locate existing buried or concealed items encountered during Project.
   6. Measured depths of foundations in relation to finish first floor datum.
   7. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.

8. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
9. Field changes of dimension and detail.
10. Details not on original Drawings.

G. Submit documents to Architect / Owner upon completion of Work.

1.7 WARRANTIES AND GUARANTEES

A. Refer to Owner Contract Requirements / Terms and Conditions for Additional information and requirements.

B. General: The warranty and guarantee provisions of the General Conditions apply to all work of the contract, including but not limited to the following specific categories related to individual units of work specified in various sections of these specifications:
1. Special Project Warranty (Guarantee): A warranty specifically written and signed by the Contractor for a defined portion of the work, and, where required, countersigned by sub-contractor, installer, manufacturer, or other entity engaged by the Contractor.
2. Specified Product Warranty: A warranty which is required by the contract documents, to be provided for a manufactured product incorporated in the Work, regardless of whether manufacturer has published a similar warranty without regard for specific incorporation into the work, or has written and executed a special project warranty as a direct result of contract document requirements.
3. Coincidental Product Warranty: A warranty which is not specifically required by the Contract Documents (other than as specified in this Section); but which is available on a product incorporated into the work, by virtue of the fact that the manufacturer of the product has published a warranty in connection with purchases and users of the product without regard for specific applications except as otherwise limited by terms of the warranty.

C. All work undertaken as part of the project shall be warranted for a period of not less than [1] year. Individual sections / products may have specific additional warranty requirements.

D. Provide notarized copies of warranty documents to the Owner.
1. Execute and assemble transferable warranty documents from subcontractors, suppliers, and manufacturers.

E. Original warranties are required to be provided to the Owner prior to final payment.

PART 2 PRODUCTS

Not Required

PART 3 EXECUTION

3.1 FINAL CLEANING AND SITE REPAIR

A. Provide final cleaning of all work areas:
1. Execute final cleaning prior to final inspection.
2. Clean Project site, yard, and grounds in areas disturbed by Construction activities.
3. Sweep paved areas broom clean. Remove all spills, stains, and foreign deposits.
4. Rake grounds that are neither planted or paved to a smooth, even textured surface.
5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
6. Remove debris and surface dust from roofs, plenums, values, attics, and similar spaces.
7. Sweep concrete floors broom clean in non-occupied spaces.
8. Vacuum carpet and soft surfaces to remove debris. Shampoo if conditions warrant.

9. Clean transparent materials including glass in doors and windows. Remove glazing compounds.
10. Remove all labels which are not permanent.
11. Clean plumbing fixtures to sanitary condition, free of all stains.
12. Replace air filters.
13. Clean ductwork if utilized during construction without proper protection.
14. Clean light fixtures, globes, reflectors.
15. Clean interiors of all cabinetry.
16. Remove waste and surplus materials, rubbish, and construction facilities from site.

B. Restore all work staging and lay-out areas to pre-construction conditions, including but not limited to, removal of debris, temporary facilities, grading and grass seeding and cleaning or repair of impacted structures.

3.2 REPAIR OF THE WORK

A. Complete repair and restoration operations before requesting inspection for determination of Contract Completion.

B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

END OF SECTION

SECTION 01 78 00 – OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Operation and Maintenance Manuals.

1.2 OPERATION AND MAINTENANCE MANUALS

A. Organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system.

B. Binder cover: printed title "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project. Label on the front and spine of the binder.

C. Title Page: Include the following information:
   1. Subject matter included in manual.
   2. Name and address of Project.
   3. Name and address of Owner.
   4. Date of submittal.
   5. Name and contact information for Contractor.
   6. Name and contact information for all Sub-Contractors.
   7. Name and contact information for all Major Suppliers.
   8. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.

D. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
   1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.

E. Manual Organization:
   1. Organize into sets of manageable size. Arrange contents by CSI division. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
   2. Internally subdivide binder contents with permanent page dividers, logically organized, with tab titles legibly printed under reinforced laminated plastic tabs.

F. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents.

G. Submit O+M manuals prior to Contract Completion.
   1. Bind one [1] hard copy in 8-1/2 x 11 inch text pages, three D side ring binders with durable plastic covers.
   2. Create [2] digital copies in PDF format in a format and organization to match the hard copy.

H. Content:
   1. Title Page
   2. Table of Contents
   3. Permit and Inspection Information
   4. Project submittals, organized by CSI division
   5. Operation and maintenance instructions, arranged by CSI division and system.
      a. Building Products, Equipment, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations.

b. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.
c. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.
d. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.
e. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; service schedule, disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.
f. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.
g. Spare Parts List and Source Information.
h. Maintenance Service Contracts.

6. Project documents and certificates.
   a. Obtain warranties and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers.
7. Colors / finishes / samples
8. Other documentation required.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

SECTION 02 41 16 - SELECTIVE DEMOLITION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Demolishing designated building equipment and fixtures.
   2. Demolishing designated construction.
   3. Cutting and alterations for completion of the Work.
   4. Removing designated items for salvage by Owner.
   5. Protecting items designated to remain.
   6. Removing demolished materials.

1.2 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of capped utilities, concealed utilities discovered during demolition and any subsurface obstructions or conditions that require noting.

1.3 QUALITY ASSURANCE

A. Conform to applicable code for demolition work, dust control, protection, products requiring electrical disconnection and re-connection

1.4 SCHEDULING

A. Schedule Work to coincide with improvements of the building / unit.

B. Coordinate utility and building service interruptions with Owner.

C. Do not disable or disrupt site fire or life safety systems without three days prior written notice to Owner.

D. Schedule tie-ins to existing systems to minimize disruption.

1.5 PROJECT CONDITIONS

A. Cease operations immediately if structure appears to be in danger and notify Architect. Do not resume operations until directed.

PART 2 PRODUCTS

NOT APPLICABLE

PART 3 EXECUTION

3.1 PREPARATION

A. Notify affected utility companies before starting work and comply with their requirements.

B. Call Local Utility Line Information service not less than three working days before performing Work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

C. Mark location and termination of utilities.

D. Erect, and maintain temporary barriers and security devices including warning signs and lights, and similar measures, for protection of the public, Owner, and existing improvements indicated to remain.

E. Do not disable or disrupt building fire or life safety systems without 3 days prior written notice to Owner.

F. Do not close or obstruct building egress path.

G. Protect existing structure / items to remain.

3.2 SALVAGE REQUIREMENTS

A. Coordinate with Owner to identify building components and equipment required to be removed and delivered to Owner.

B. Tag components and equipment Owner designates for salvage.

C. Protect designated salvage items from demolition operations until items can be removed.

D. Carefully remove building components and equipment indicated to be salvaged.

E. Disassemble as required to permit removal from building.

F. Package small and loose parts to avoid loss.

G. Mark equipment and packaged parts to permit identification and consolidation of components of each salvaged item.

H. Prepare assembly instructions consistent with disassembled parts. Package assembly instructions in protective envelope and securely attach to each disassembled salvaged item.

I. Deliver salvaged items to location identified by Owner. Obtain signed receipt from Owner.

3.3 RECYCLING AND WASTE REDUCTION

A. Implement measures to reduce waste going to Landfills by creating a recycling and waste reduction plan for all demolition activities.

B. Sort demolition debris as applicable to separate different salvageable and recyclable materials.

C. Provide necessary hauling and coordination to such facilities.

D. Identify materials to be recycled as part of the project and submit an itemized list to the Architect/Owner along with the location. Submit proposed documentation prior to the start of work.

E. Continuous recycling and waste reduction throughout the course of construction.

F. Provide area designated for sorting of materials in an effort to maximize the potential recycling efforts.

G. Maintain a log of waste refuse by type/weight/volume and of recycling efforts by the same.

3.4 DEMOLITION

A. Provide all demolition and removals necessary for the proposed work. Work includes abandoned furnishings, equipment, building components that are required to be removed to render rent ready.

B. Conduct demolition to minimize interference with adjacent and occupied buildings/units.

C. Maintain protected egress from and access to adjacent existing buildings/units at all times.

D. Do not close or obstruct roadways or sidewalks without permits.

E. Demolish in orderly and careful manner. Protect existing improvements.

F. Carefully remove building components indicated to be reused.

G. See drawings for items to be salvaged and turned over to Owner.

H. Confirm with Owner prior to demolition to verify any items to be salvaged and turned over to Owner.

I. Disassemble components as required to permit removal.

J. Box and label contents for all items scheduled to salvage. Obtain sign off.

K. Remove demolished materials from site except where specifically noted otherwise. Do not burn or bury materials on site.

L. Remove materials as Work progresses. Upon completion of Work, leave areas in clean condition.

M. Remove temporary Work.

3.5 CLEAN UP

A. Remove demolished materials from site as work progresses.

B. Leave areas of work in clean condition.

END OF SECTION

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SECTION 02 41 19 – MOLD / MILDEW STAIN REMOVER

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Mold / Mildew Stain Remover for framing and finishes.

1.2 SUBMITTALS

A. Product Data: Submit data for each sealer, application, and accessories.

1.3 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing Work of this section with minimum three years experience.

PART 2 PRODUCTS

2.1 MOLD / MILDEW STAIN REMOVER

A. Commercial Grade Mold & Mildew Stain Remover specifically designed for the removal of surface mold or mildew from framing and finishes.

PART 3 EXECUTION

3.1 APPLICATION

A. Remove existing finishes as specified on drawings / scope of work.

B. Surfaces should be clean, dry, sound, and free of excess dust, dirt, chalky material, grime, grease, oil, wax, mildew, contamination that interfere with adhesion.

C. Follow all installation / application instructions from the product manufacturer.

D. Apply additional applications as necessary to completely address any mold / mildew growth.

E. Application areas include crawl space, exposed first floor framing, roof framing, subfloor, sheathing, etc.

END OF SECTION

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SECTION 02 50 00 - HAZARDOUS MATERIALS SPECIFICATIONS

PART 1 GENERAL

1.1 SAMPLING

A. Mac Paran Consulting provided sampling of the existing building materials including asbestos and lead based paint. Copies of these reports are available for review.

1.2 SUMMARY

A. Provide the appropriate abatement of the identified materials per the specifications prepared by Mac Paran Consulting that follow this section, using industry standard practices as identified for the proper execution of the proposed renovations to the buildings. Provide all necessary protection, air testing, removal, and disposal.

B. Comply with Occupational Safety and Health Administration regulation 29 CFR 1926.62 “Lead in Construction Standard” as well as the Environmental Protection Agency Lead, Renovation, Repair and Painting Rule.

C. Follow all applicable EPA rules and regulations when working with hazardous materials. Remain in compliance at all times during the project.

D. Hazardous materials exist at various areas of the project site as identified.

E. If any work person encounters any material which they suspect may be hazardous or toxic, they shall immediately advise the Owner. The contractor shall take immediate and appropriate action to protect the building users and workers in accordance with federal, state, and local laws, codes and regulations. The architect and architect's consultants shall have no responsibility for the discovery, presence, handling, removal or disposal of or exposure of persons to hazardous materials in any form at the projects site, including but not limited to asbestos, asbestos products, polychlorinated biphenyl (pcb) or other toxic substances.
   1. The contractor is hereby advised that RDA Group Architects, LLC is not a design professional in the determination of the presence of hazardous materials, nor is RDA a design professional involved in making recommendations regarding the testing, removal, encapsulation or other corrective measures pertaining to hazardous materials.
   2. If the work which is to be performed under the contract interfaces in any way with the existing components which contain hazardous materials, it is the contractor’s responsibility to contact the owner's environmental consultant regarding the proper means & methods to be utilized in dealing with hazardous materials.
   3. By execution of the contract for construction, the contractor hereby agrees to bring no claim for negligence, breach of contract, indemnity or otherwise against the architect, his principles, employees, agents or consultants if such a claim in any way would involve the investigation of or remedial work related to hazardous materials in the project.
   4. By execution of the contract for construction, the contractor further agrees to defend, indemnify and hold the architect, his principles, employees, agents or consultants harmless from any such asbestos or other hazardous materials related claims that may be brought by the contractor's subcontractors, suppliers or other third parties who may be acting under the direction of the contractor pursuant to this project.

1.3 EXECUTION

A. Contractor shall be fully responsible for the proper removal and disposal of materials. All work shall be performed by trained individuals in accordance with the requirements of this Section, all current Federal, State, and Local laws/regulations.

END OF SECTION

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Cincinnati

3959 Fulton Grove Rd.
Cincinnati, Ohio 45245
(513) 752-9111

Services

Phase I ESA's
Phase II Investigations
Asbestos
Lead-Based Paint
Industrial Hygiene
Indoor Air Quality/Mold
Radon
Safety
Training

Lead-Based Paint Inspection

1002 Robinson Drive
Springfield, Ohio 45506

Year of Construction: Pre 1978

Prepared for:

Springfield Metropolitan Housing Authority
2026 West High Street
Springfield, Ohio 45502
(937) 325-7331

Springfield Metropolitan
HOUSING AUTHORITY

Prepared by:

m.a.c Paran

m.a.c. Paran Consulting Services, Inc.

Tom Wenk

Tom Wenk
Ohio Lead Risk Assessor: LA-000898

Michelle Paraniuk

Michelle Paraniuk, M.S., President

December 2025

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1.0 Disclosure Requirements for Residential Units

Ohio law (Section 5302.30 of the Revised Code) requires every person who intends to transfer any residential real property by sale, land installment contract, lease with the option to purchase, exchange, or lease for a term of ninety-nine years and renewable forever, to complete and provide a copy to the prospective transferee of the applicable property disclosure forms, disclosing known hazardous conditions of the property, including lead-based paint hazards.

Federal law (24 CFR part 35 and 40 CFR part 745) requires sellers and lessors of residential units constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than six years of age resides or is expected to reside in such housing) or any zero-bedroom dwelling to disclose and provide a copy of this report to new purchasers or lessees before they become obligated under a lease or sales contract. Property owners and sellers are also required to distribute an educational pamphlet approved by the United States Environmental Protection Agency (EPA) and include standard warning language in sales contracts or in or attached to lease contracts to ensure that parents have the information they need to protect children from lead-based paint hazards.

2.0 Executive Summary

On December 8, 2025, a lead-based paint inspection was conducted of the residential structure located at 1002 Robinson Drive, Springfield, Ohio 45506. The inspection included:

- ✓ Visual assessment of paint condition
- ✓ Use of a portable X-ray fluorescence (XRF) analyzer to test for lead in paint.

One hundred thirty-eight (138) readings (including calibration readings) were collected from the interior and exterior of the structure. Refer to Table 1 for a listing of all readings collected. It should be noted that no lead-based paint (LBP) was identified.

3.0 Observations/Limitations to the Inspection

The structure was observed to be in fair condition. The following limitations were encountered during the inspection:

Observation/Limitation	Presumed Positive
Upper structural elements were not tested	Yes
Cove base was located in various areas	No

4.0 Previous Lead Inspection/Risk Assessment History

No prior report was made available for review.

5.0 Lead Paint Results

An X-Ray Fluorescence (XRF) Lead Analyzer was used to test the paint for lead. This analyzer is a non-destructive method for testing paint, providing immediate results for each test conducted.

XRF Manufacturer:	SciAps
XRF Device/Serial Number:	Model X-550 No. 02091
XRF Operator:	Tom Wenk
Operator License Number:	LA-000898
Inspection Date:	December 8, 2025
Inspection Site:	1002 Robinson Drive Springfield, Ohio 45506

Paint containing lead equal to or greater than 1.0 mg/cm^2 is considered to be lead-based paint per the Department of Housing and Urban Development (HUD) and EPA definitions. This is of importance should the property be renovated into residential units. Building components in a room that are similar in construction history to those that tested positive for lead are considered positive for lead.

Paint conditions:

- ✓ Intact: Entire surface area is judged to be intact. Intact surfaces may or may not have been tested and need only monitoring.
- ✓ Deteriorated: shows any sign of abrasion and/or is peeling, chipping, chalking, or cracking, or otherwise damaged or separated from the substrate.

The following table represents readings collected during the assessment. **Readings that are highlighted in red represent coatings containing lead equal to or exceeding 1.0 mg/cm^2 (i.e., lead-based coating per HUD/EPA definition).**

Table 1: XRF Results Table

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
1	0.97	Positive	Calibration							
2	0.98	Positive	Calibration							
3	1.01	Positive	Calibration							
4	0.99	Positive	Calibration							
5	0	Negative	1-1	Kitchen/Dining Room		Wall	A	Drywall	Beige	Intact
6	0.36	Negative	1-1	Kitchen/Dining Room		Wall	B	Drywall	Beige	Intact
7	0	Negative	1-1	Kitchen/Dining Room		Wall	C	Drywall	Beige	Intact
8	0	Negative	1-1	Kitchen/Dining Room		Wall	D	Drywall	Beige	Intact
9	0	Negative	1-1	Kitchen/Dining Room		Ceiling	NA	Drywall	Beige	Intact
10	0	Negative	1-1	Kitchen/Dining Room		Baseboard	A	Wood	Beige	Intact
11	0	Negative	1-1	Kitchen/Dining Room	Door (Front Entry)	Casing	A	Wood	Beige	Intact
12	0	Negative	1-1	Kitchen/Dining Room	Door (Front Entry)	Jamb	A	Metal	Beige	Deteriorated

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
13	0	Negative	1-1	Kitchen/Dining Room	Door (Front Entry)		A	Metal	Beige	Intact
14	0	Negative	1-1	Kitchen/Dining Room	Cabinets	Door	B	Wood	Stained	Intact
15	0	Negative	1-1	Kitchen/DiningRoom	Cabinets	Shelf	B	Wood	Stained	Intact
16	0	Negative	1-1	Kitchen/Dining Room	Cabinets	Cabinet	B	Wood	Stained	Intact
17	0	Negative	1-1	Kitchen/Dining Room	Door (Wall C Closet)		C	Wood	Brown	Intact
18	0	Negative	1-1	Kitchen/Dining Room	Closet	Door	C	Wood	Brown	Intact
19	0	Negative	1-1	Kitchen/Dining Room	Closet	Jamb	C	Wood	Beige	Deteriorated
20	0.01	Negative	1-1	Kitchen/Dining Room	Closet	Floor	C	Wood	Brown	Intact
21	0	Negative	1-1	Kitchen/Dining Room	Closet	Wall	B	Drywall	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
22	0	Negative	1-2	Living Room		Wall	A	Drywall	Beige	Intact
23	0	Negative	1-2	Living Room		Wall	B	Drywall	Beige	Intact
24	0	Negative	1-2	Living Room		Wall	C	Drywall	Beige	Intact
25	0	Negative	1-2	Living Room		Wall	D	Drywall	Beige	Intact
26	0	Negative	1-2	Living Room		Ceiling	NA	Drywall	Beige	Intact
27	0	Negative	1-2	Living Room		Baseboard	C	Wood	Beige	Intact
28	0	Negative	1-2	Living Room	Door (Back Entry)	Casing	C	Wood	Beige	Intact
29	0	Negative	1-2	Living Room	Door (Back Entry)	Jamb	C	Wood	Beige	Deteriorated
30	0	Negative	1-2	Living Room	Door (Back Entry)		C	Metal	Beige	Intact
31	0	Negative	1-2	Living Room	Door	DoorTo Wall D Closet	D	Wood	Brown	Intact
32	0	Negative	1-2	Living Room	Closet (Wall D)	Jamb	D	Wood	Beige	Intact
33	0.01	Negative	1-2	Living Room	Closet (Wall D)	Casing	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
34	0	Negative	1-2	Living Room	Closet (Wall D)	Wall	D	Drywall	Beige	Intact
35	0	Negative	1-2	Living Room	Closet (Wall D)	Shelf	D	Wood	Beige	Intact
36	0	Negative	1-2	Living Room	Closet (Wall D)	Shelf Edge	D	Wood	Beige	Intact
37	0	Negative	1-2	Living Room	Closet (Wall D)	Shelf Support	D	Wood	Beige	Intact
38	0	Negative	1-2	Living Room	Closet (Wall A)	Door	A	Wood	Brown	Intact
39	0	Negative	1-2	Living Room	Closet (Wall A)	Wall	A	Drywall	Beige	Intact
40	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf	A	Wood	Beige	Intact
41	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf Edge	A	Wood	Beige	Intact
42	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf Support	A	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
43	0	Negative	1-3	Stairs To second Floor	Stairs	Wall	B	Drywall	Beige	Intact
44	0	Negative	1-3	StairsTo second Floor	Stairs	Wall	C	Drywall	Beige	Intact
45	0	Negative	1-3	Stairs To second Floor	Stairs	Wall	D	Drywall	Beige	Intact
46	0	Negative	1-3	Stairs To second Floor	Stairs	Tread	A	Wood	Stained	Intact
47	0	Negative	1-3	Stairs To second Floor	Stairs	Riser	A	Wood	Stained	Intact
48	0	Negative	1-3	Stairs To second Floor	Stairs	Stringer	D	Wood	Stained	Intact
49	0	Negative	1-3	Stairs To second Floor	Stairs	Stringer Casing	D	Wood	White	Intact
50	0	Negative	1-3	Stairs To second Floor	Stairs	Railing	B	Metal	Black	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
51	0	Negative	2-1	Bathroom		Wall	A	Drywall	Beige	Intact
52	0	Negative	2-1	Bathroom		Wall	B	Drywall	Beige	Intact
53	0	Negative	2-1	Bathroom		Wall	C	Drywall	Beige	Intact
54	0	Negative	2-1	Bathroom		Wall	D	Drywall	Beige	Intact
55	0	Negative	2-1	Bathroom		Ceiling	D	Drywall	Beige	Intact
56	0	Negative	2-1	Bathroom		Baseboard	B	Wood	Beige	Intact
57	0.01	Negative	2-1	Bathroom	Door (Entry)	Casing	C	Wood	Beige	Intact
58	0	Negative	2-1	Bathroom	Door (Entry)	Jamb	C	Wood	Beige	Intact
59	0	Negative	2-1	Bathroom	Door (Entry)		C	Wood	Brown	Intact
60	0	Negative	2-1	Bathroom	Vanity	Door	D	Wood	Stained	Intact
61	0.01	Negative	2-1	Bathroom	Vanity	Shelf	D	Wood	Stained	Intact
62	0	Negative	2-1	Bathroom	Vanity	Shelf Edge	D	Wood	Stained	Intact
63	0	Negative	2-1	Bathroom	Vanity	Shelf Support	D	Wood	Stained	Intact

mac Paran

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
64	0	Negative	2-2	Bedroom 1		Wall	A	Drywall	Beige	Intact
65	0	Negative	2-2	Bedroom 1		Wall	B	Drywall	Beige	Intact
66	0	Negative	2-2	Bedroom 1		Wall	C	Drywall	Beige	Intact
67	0	Negative	2-2	Bedroom 1		Wall	D	Drywall	Beige	Intact
68	0	Negative	2-2	Bedroom 1		Ceiling	NA	Drywall	Beige	Intact
69	0	Negative	2-2	Bedroom 1		Baseboard	C	Wood	Beige	Intact
70	0.01	Negative	2-2	Bedroom 1	Door (Entry)	Casing	C	Wood	Beige	Intact
71	0.01	Negative	2-2	Bedroom 1	Door (Entry)	Jamb	C	Wood	Beige	Intact
72	0	Negative	2-2	Bedroom 1	Door (Entry)	Door	C	Wood	Brown	Intact
73	0	Negative	2-2	Bedroom 1	Door (Wall D Closet)	Door	D	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
74	0	Negative	2-2	Bedroom 1	Closet	Door	D	Wood	Brown	Intact
75	0.01	Negative	2-2	Bedroom 1	Closet	Wall	A	Wood	Brown	Intact
76	0	Negative	2-2	Bedroom 1	Closet	Shelf	D	Wood	Beige	Intact
77	0	Negative	2-2	Bedroom 1	Closet	Shelf Edge	D	Wood	Beige	Intact
78	0	Negative	2-2	Bedroom 1	Closet	Shelf Support	D	Wood	Beige	Intact
79	0	Negative	2-2	Bedroom 1	Closet	Access Panel	D	Metal	Beige	Intact
80	0	Negative	2-3	Bedroom 2		Wall	A	Drywall	Beige	Intact
81	0	Negative	2-3	Bedroom 2		Wall	B	Drywall	Beige	Intact
82	0	Negative	2-3	Bedroom 2		Wall	C	Drywall	Beige	Intact
83	0	Negative	2-3	Bedroom 2		Wall	D	Drywall	Beige	Intact
84	0	Negative	2-3	Bedroom 2		Ceiling	NA	Drywall	Beige	Intact
85	0	Negative	2-3	Bedroom 2		Baseboard	D	Wood	Beige	Intact
86	0.02	Negative	2-3	Bedroom 2	Door (Entry)	Casing	D	Wood	Beige	Intact
87	0.01	Negative	2-3	Bedroom 2	Door (Entry)	Jamb	D	Wood	Beige	Intact
88	0	Negative	2-3	Bedroom 2	Door (Entry)	Door	D	Wood	Brown	Intact
89	0	Negative	2-3	Bedroom 2	Door (Wall A Closet)	Door	A	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
90	0	Negative	2-3	Bedroom 2	Closet	Door	C	Wood	Brown	Intact
91	0.01	Negative	2-3	Bedroom 2	Closet	Wall	A	Drywall	Beige	Intact
92	0	Negative	2-3	Bedroom 2	Closet	Shelf	A	Wood	Beige	Intact
93	0	Negative	2-3	Bedroom 2	Closet	Shelf Edge	A	Wood	Beige	Intact
94	0	Negative	2-3	Bedroom 2	Closet	Shelf Support	A	Wood	Beige	Intact
95	0	Negative	2-4	Bedroom 3		Wall	A	Drywall	Beige	Intact
96	0	Negative	2-4	Bedroom 3		Wall	B	Drywall	Beige	Intact
97	0	Negative	2-4	Bedroom 3		Wall	C	Drywall	Beige	Intact
98	0	Negative	2-4	Bedroom 3		Wall	D	Drywall	Beige	Intact
99	0	Negative	2-4	Bedroom 3		Ceiling	D	Drywall	Beige	Intact
100	0	Negative	2-4	Bedroom 3		Baseboard	D	Wood	Beige	Intact
101	0.01	Negative	2-4	Bedroom 3	Door (Entry)	Casing	A	Wood	Beige	Intact
102	0	Negative	2-4	Bedroom 3	Door (Entry)	Jamb	A	Wood	Beige	Intact
103	0	Negative	2-4	Bedroom 3	Door (Entry)	Door	A	Wood	Brown	Intact
104	0	Negative	2-4	Bedroom 3	Door (Wall D Closet)	Door	D	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
105	0.02	Negative	2-4	Bedroom 3	Closet	Door	D	Wood	Brown	Intact
106	0.01	Negative	2-4	Bedroom 3	Closet	Jamb	D	Wood	Beige	Intact
107	0.01	Negative	2-4	Bedroom 3	Closet	Casing	D	Wood	Beige	Intact
108	0	Negative	2-4	Bedroom 3	Closet	Wall	D	Drywall	Beige	Intact
109	0	Negative	2-4	Bedroom 3	Closet	Shelf	D	Wood	Beige	Intact
110	0	Negative	2-4	Bedroom 3	Closet	Shelf Edge	D	Wood	Beige	Intact
111	0.01	Negative	2-4	Bedroom 3	Closet	Shelf Support	C	Wood	Beige	Intact
112	0	Negative	2-4	Bedroom 3	Closet	Shelf	A	Wood	Brown	Intact
113	0	Negative	2-5	Hallway		Wall	A	Drywall	Beige	Intact
114	0.01	Negative	2-5	Hallway		Wall	B	Drywall	Beige	Intact
115	0	Negative	2-5	Hallway		Wall	C	Drywall	Beige	Intact
116	0	Negative	2-5	Hallway		Wall	D	Drywall	Beige	Intact
117	0.01	Negative	2-5	Hallway		Ceiling	NA	Drywall	Beige	Intact
118	0	Negative	2-5	Hallway		Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
119	0	Negative	2-5	Hallway	Door (Wall A Closet)	Door	A	Wood	Brown	Intact
120	0	Negative	2-5	Hallway	Closet	Door	A	Wood	Brown	Intact
121	0	Negative	2-5	Hallway	Closet	Jamb	A	Wood	Beige	Intact
122	0	Negative	2-5	Hallway	Closet	Casing	A	Wood	Beige	Intact
123	0.01	Negative	2-5	Hallway	Closet	Shelf	A	Wood	Beige	Intact
124	0	Negative	2-5	Hallway	Closet	Shelf Edge	A	Wood	Stained	Intact
125	0	Negative	2-5	Hallway	Closet	Shelf Support	A	Wood	Beige	Intact
126	0	Negative	2-5	Hallway	Closet	Wall	A	Drywall	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
127	0	Negative	Exterior	Main Structure	Door	Door	A	Metal	Beige	Intact
128	0.21	Negative	Exterior	Main Structure	Jamb	Jamb	A	Metal	White	Intact
129	0.05	Negative	Exterior	Main Structure	Trim	Casing	A	Wood	Beige	Intact
130	0.12	Negative	Exterior	Main Structure	Header	Header	A	Metal	Beige	Deteriorated
131	0	Negative	Exterior	Main Structure	Door		C	Metal	Beige	Intact
132	0	Negative	Exterior	Main Structure	Jamb	Jamb	C	Wood	White	Deteriorated
133	0	Negative	Exterior	Main Structure	Trim	Casing	C	Wood	Beige	Intact
134	0.13	Negative	Exterior	Main Structure	Header	Header	C	Metal	Beige	Deteriorated
135	0.99	Positive	Calibration							
136	1	Positive	Calibration							
137	1.01	Positive	Calibration							
138	1	Positive	Calibration							

Appendix I

Lead Hazard Control Levels/Methods

Lead Hazard Levels

Lead is hazardous, especially for children who are six years of age or younger. Lead can reduce intelligence, cause behavior and learning problems, slow growth and impair hearing. Children can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

Lead-based paint is any paint or surface coating that contains lead equal to or in excess of 1.0 milligrams per square centimeter (1.0 mg/cm^2) or equal to or in excess of 0.5% by weight. Lead-based paint is hazardous when it is:

1. On a friction surface. The paint on surfaces like window sashes and jambs can break down during normal use and release lead dust. If dust levels on the nearest flat surface exceed acceptable levels, then the friction surface is a hazard.

2. On a chewable surface that has evidence of teeth marks. These are surfaces, such as windowsills, railings, door edges that a young child can mouth or chew.

3. On an impact surface where there is damaged or otherwise deteriorated paint from impact from a related building component (such as a door frame banging together).

4. Deteriorated paint that is peeling, chipping, chalking, or cracking. When lead paint breaks down or is disturbed due to remodeling, dry scraping, or water damage; paint chips and dust can be released and easily ingested by young children through hand-to-mouth activity.

Lead Hazard Control Methods

1. Non-friction or Non-impact Surfaces. Examples include: interior or exterior walls, ceilings, trim, casings, baseboards, etc.

    a. Removal of the lead-based painted component and replacement with a lead-free component.

    b. Paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals, or certain abrasive measures either onsite or offsite.

    c. Enclosure of the lead-based painted component with durable materials. Durable materials include wallboard, drywall/plaster, paneling, siding, coil stock and the sealing or caulking of edges and joints.

    d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

    e. Paint stabilization and a written ongoing maintenance and monitoring schedule.

    f. Any other lead-safe method of permanently removing the lead hazard.

2. Friction or Impact Surfaces. Examples include window systems, doors, floors, etc.

    a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the impact surfaces with durable materials. Durable materials include wallboard, drywall/plaster, paneling, plywood, coil stock, and the sealing or caulking of edges and joints.

d. Elimination of the friction points or application of a treatment that will prevent abrasion of the friction surface and a written ongoing maintenance and monitoring schedule.

e. Any other lead-safe method of permanently removing the lead hazard.

3. Chewable Surfaces. Examples include windowsills, railings and other child-accessible surfaces that show evidence of teeth marks.

a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the lead-based painted component with a material that cannot be penetrated by a child's teeth.

d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

e. Any other lead safe method of permanently removing the lead hazard.

The following practices are **PROHIBITED**:

1. Open flame burning or torching.

2. Machine sanding or grinding without a HEPA local vacuum exhaust tool.

3. Abrasive blasting or sandblasting without a HEPA local vacuum exhaust tool.

4. Use of a heat gun operating above one thousand one hundred degrees Fahrenheit.

5. Charring paint.

6. Dry sanding.

7. Dry scraping, except when done as follows:

a. In conjunction with a heat gun operating at not more than one thousand one hundred degrees Fahrenheit.

b. Within one foot of an electrical outlet.

c. To treat defective paint spots totaling not more than two square feet in an interior room or space or eleven square feet on an exterior surface.

8. Uncontained hydroblasting or high-pressure washing.

9. Paint stripping in a poorly ventilated space using a volatile stripper that is considered a hazardous substance under 16 C.F.R. 1500.3 or a hazardous chemical under 29 C.F.R. 1910.1200 or 29 C.F.R. Pre-1960.59 in the type of work being performed.

Important Notes:

1. Residents, especially children and pregnant women, must be kept away from the lead hazard control area. Proper and thorough cleanup is important so that dust and paint chips are not left behind at the end of the job.

2. After lead hazard control work is done, the home must pass a clearance examination, typically including dust wipe samples.

3. Paint stabilization, interim window treatments, and impermanent covering of lead-contaminated soil require a written ongoing maintenance and monitoring schedule and an annual clearance examination. It is recommended that a visual check of past repairs involving painted surfaces be done annually and at unit turnover.

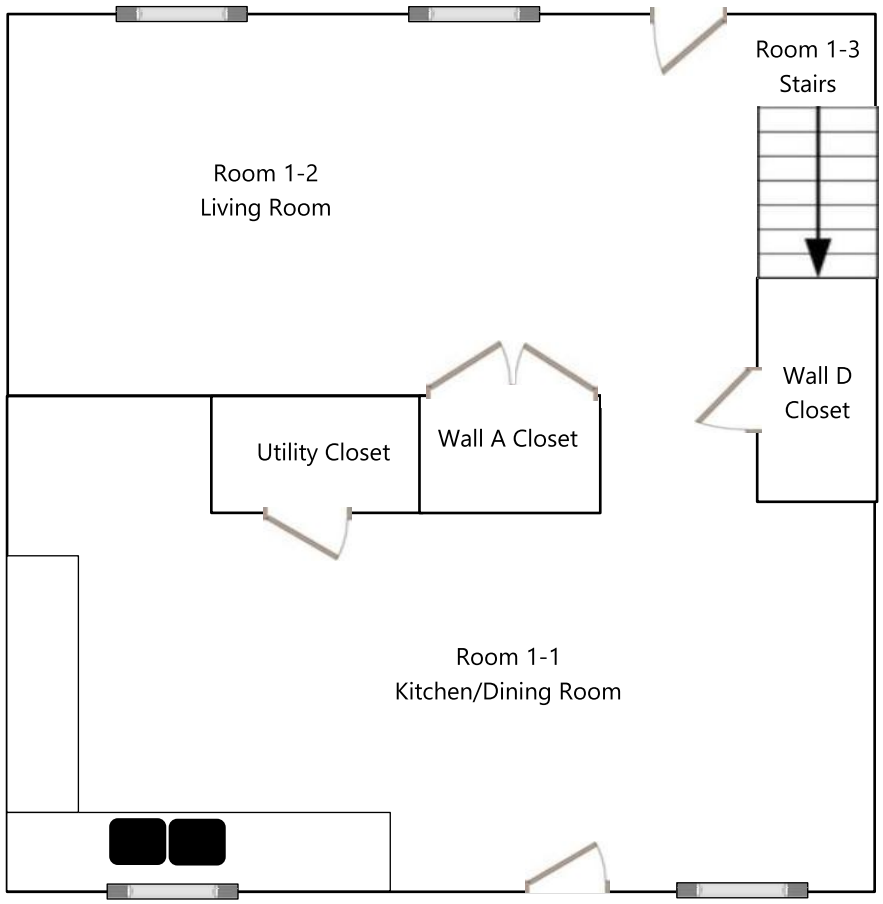
4. Other surfaces that measured below hazard limits should also be addressed to prevent them from becoming hazardous. It is recommended that lead-safe work practices be used when such surfaces are repaired or replaced.

Appendix II

Diagrams

1002 Robinson Drive
First Floor Plan

Side C



Side B

Side D

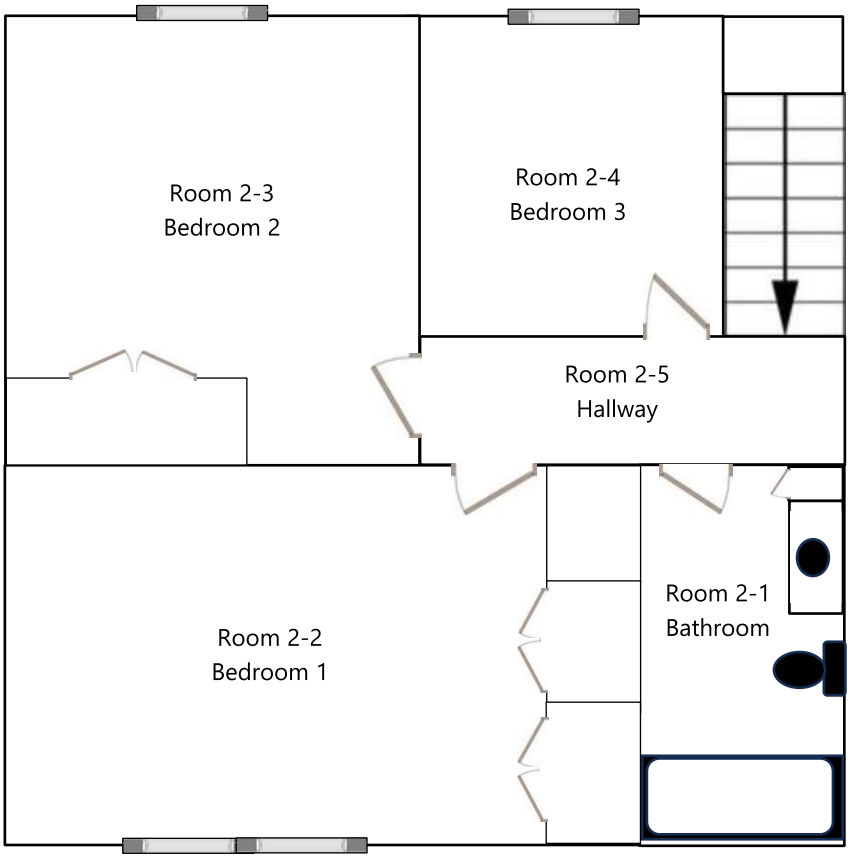
Side A

N

Property: 1002 Robinson Drive Springfield, Ohio 45506	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

1002 Robinson Drive
Second Floor Plan

Side C



Side B

Side D

Side A

N

Property: 1002 Robinson Drive Springfield, Ohio 45506	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

Appendix III

Lead Risk Assessor Certification

Ohio | Department of Health

Mike DeWine, Governor
Jon Husted, Lt.Governor

Bruce Vanderhoff, MD, MBA, Director

October 09, 2024

Thomas E Wenk
319 Shawnee Trail
Dayton OK 45458

RE: Lead Risk Assessor
License Number: LA000898
Expiration Date: 10/09/2026

Dear Thomas E Wenk:

This letter and enclosed license approves your request to be licensed as a Lead Risk Assessor. You must present your license upon request at any project site while performing duties. A copy of your license is not acceptable as proof of licensure.

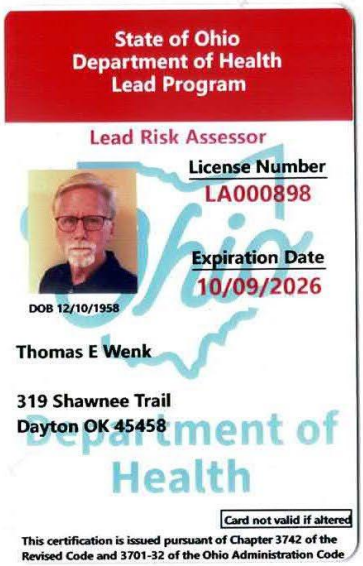
Please be aware of the rules and regulations governing your discipline for Ohio. If you choose to renew this license, you must take an Ohio approved refresher course appropriate for the discipline within your current two year licensure period. Renewal applications must be submitted prior to the expiration of your current license to avoid additional reinstatement fees. Please visit our website at www.odh.ohio.gov for information.

This license may be revoked by the Director of Health for violation of any of the requirements of 3701-32 of the Ohio Administrative Code.

If you have any questions, please call the Ohio Department of Health, Lead Poisoning Prevention Program at (614) 466-1450.

Sincerely,

Shamus Estep
Program Administrator
Bureau of Environmental Health and Radiation Protection



246 North High Street
Columbus, Ohio 43215 U.S.A.
614 | 466-3543
www.odh.ohio.gov

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Cincinnati

3959 Fulton Grove Rd.
Cincinnati, Ohio 45245
(513) 752-9111

Services

Phase I ESA's
Phase II Investigations
Asbestos
Lead-Based Paint
Industrial Hygiene
Indoor Air Quality/Mold
Radon
Safety
Training

Lead-Based Paint Inspection

1006 Robinson Drive
Springfield, Ohio 45506

Year of Construction: Pre 1978

Prepared for:

Springfield Metropolitan Housing Authority
2026 West High Street
Springfield, Ohio 45502
(937) 325-7331

Prepared by:

m.a.c. Paran Consulting Services, Inc.

Tom Wenk
Ohio Lead Risk Assessor: LA-000898

Michelle Paraniuk, M.S., President

December 2025

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1.0 Disclosure Requirements for Residential Units

Ohio law (Section 5302.30 of the Revised Code) requires every person who intends to transfer any residential real property by sale, land installment contract, lease with the option to purchase, exchange, or lease for a term of ninety-nine years and renewable forever, to complete and provide a copy to the prospective transferee of the applicable property disclosure forms, disclosing known hazardous conditions of the property, including lead-based paint hazards.

Federal law (24 CFR part 35 and 40 CFR part 745) requires sellers and lessors of residential units constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than six years of age resides or is expected to reside in such housing) or any zero-bedroom dwelling to disclose and provide a copy of this report to new purchasers or lessees before they become obligated under a lease or sales contract. Property owners and sellers are also required to distribute an educational pamphlet approved by the United States Environmental Protection Agency (EPA) and include standard warning language in sales contracts or in or attached to lease contracts to ensure that parents have the information they need to protect children from lead-based paint hazards.

2.0 Executive Summary

On December 8, 2025, a lead-based paint inspection was conducted of the residential structure located at 1006 Robinson Drive, Springfield, Ohio 45506. The inspection included:

- ✓ Visual assessment of paint condition
- ✓ Use of a portable X-ray fluorescence (XRF) analyzer to test for lead in paint.

One hundred twenty-eight (128) readings (including calibration readings) were collected from the interior and exterior of the structure. Refer to Table 1 for a listing of all readings collected.

3.0 Observations/Limitations to the Inspection

The structure was observed to be in fair condition. The following limitations were encountered during the inspection:

Observation/Limitation	Presumed Positive
Upper structural elements were not tested	Yes
Cove base was located in various areas	No

4.0 Previous Lead Inspection/Risk Assessment History

No prior report was made available for review.

5.0 Lead Paint Results

An X-Ray Fluorescence (XRF) Lead Analyzer was used to test the paint for lead. This analyzer is a non-destructive method for testing paint, providing immediate results for each test conducted.

XRF Manufacturer:	SciAps
XRF Device/Serial Number:	Model X-550 No. 02091
XRF Operator:	Tom Wenk
Operator License Number:	LA-000898
Inspection Date:	December 8, 2025
Inspection Site:	1006 Robinson Drive Springfield, Ohio 45506

Paint containing lead equal to or greater than 1.0 mg/cm^2 is considered to be lead-based paint per the Department of Housing and Urban Development (HUD) and EPA definitions. This is of importance should the property be renovated into residential units. Building components in a room that are similar in construction history to those that tested positive for lead are considered positive for lead.

Paint conditions:

- ✓ Intact: Entire surface area is judged to be intact. Intact surfaces may or may not have been tested and need only monitoring.
- ✓ Deteriorated: shows any sign of abrasion and/or is peeling, chipping, chalking, or cracking, or otherwise damaged or separated from the substrate.

The following table represents readings collected during the assessment. **Readings that are highlighted in red represent coatings containing lead equal to or exceeding 1.0 mg/cm^2 (i.e., lead-based coating per HUD/EPA definition).**

Table 1: XRF Results Table

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
1	0	Negative	1-1	Kitchen/Dining Room		Wall	A	Drywall	Beige	Intact
2	0	Negative	1-1	Kitchen/Dining Room		Wall	B	Drywall	Beige	Intact
3	0	Negative	1-1	Kitchen/Dining Room		Wall	C	Drywall	Beige	Intact
4	0	Negative	1-1	Kitchen/Dining Room		Wall	D	Drywall	Beige	Intact
5	0	Negative	1-1	Kitchen/Dining Room		Ceiling	NA	Drywall	Beige	Intact
6	0	Negative	1-1	Kitchen/Dining Room		Jamb	A	Metal	Beige	Deteriorated
7	0	Negative	1-1	Kitchen/Dining Room		Door	A	Metal	Beige	Intact
8	0	Negative	1-1	Kitchen/Dining Room	Cabinets	Door	B	Wood	Stained	Intact
9	0	Negative	1-1	Kitchen/Dining Room	Cabinets	Shelf	B	Wood	Stained	Intact
10	0	Negative	1-1	Kitchen/Dining Room	Cabinets	Cabinet	B	Wood	Stained	Intact
11	0	Negative	1-1	Kitchen/Dining Room	Door Wall C Closet		C	Wood	Brown	Intact
12	0	Negative	1-1	Kitchen/Dining Room	Door Wall C Utility Closet		A	Wood	Brown	Intact
13	0	Negative	1-1	Kitchen/Dining Room		Wall	B	Drywall	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
14	0.01	Negative	1-2	Living Room		Wall	A	Drywall	Beige	Intact
15	0	Negative	1-2	Living Room		Wall	B	Drywall	Beige	Intact
16	0	Negative	1-2	Living Room		Wall	C	Drywall	Beige	Intact
17	0	Negative	1-2	Living Room		Wall	D	Drywall	Beige	Intact
18	0	Negative	1-2	Living Room		Ceiling	D	Drywall	Beige	Intact
19	0	Negative	1-2	Living Room	Door (Back entry)	Casing	C	Wood	Beige	Intact
20	0	Negative	1-2	Living Room	Door (Back entry)	Jamb	C	Metal	Beige	Intact
21	0	Negative	1-2	Living Room	Door (Back entry)	Door	C	Metal	Beige	Intact
22	0	Negative	1-2	Living Room	Door Wall D Closet	Door	D	Wood	Brown	Intact
23	0.01	Negative	1-2	Living Room	Closet (Wall D)	Jamb	D	Metal	Beige	Intact
24	0.01	Negative	1-2	Living Room	Closet (Wall D)	Casing	D	Wood	Beige	Intact
25	0.01	Negative	1-2	Living Room	Closet (Wall D)	Wall	D	Drywall	Beige	Intact
26	0	Negative	1-2	Living Room	Closet (Wall D)	Shelf	D	Wood	Beige	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
27	0	Negative	1-2	Living Room	Closet (Wall D)	Shelf Edge	D	Wood	Beige	Intact
28	0.01	Negative	1-2	Living Room	Closet (Wall D)	Shelf Support	D	Wood	Beige	Intact
29	0	Negative	1-2	Living Room	Closet (Wall A)	Door	C	Wood	Brown	Intact
30	0	Negative	1-2	Living Room	Closet (Wall A)	Jamb	C	Wood	Beige	Intact
31	0	Negative	1-2	Living Room	Closet (Wall A)	Wall	C	Drywall	Beige	Intact
32	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf	C	Wood	Beige	Intact
33	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf Edge	C	Wood	Beige	Intact
34	0	Negative	1-2	Living Room	Closet (Wall A)	Shelf Support	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
35	0	Negative	1-3	Stairs To Second Floor	Stairs	Wall	B	Drywall	Beige	Intact
36	0	Negative	1-3	Stairs To Second Floor	Stairs	Wall	C	Drywall	Beige	Intact
37	0	Negative	1-3	Stairs To Second Floor	Stairs	Wall	D	Drywall	Beige	Intact
38	0	Negative	1-3	Stairs To Second Floor	Stairs	Tread	D	Wood	Stained	Intact
39	0	Negative	1-3	Stairs To Second Floor	Stairs	Riser	D	Wood	Stained	Intact
40	0	Negative	1-3	Stairs To Second Floor	Stairs	Stringer	D	Wood	Stained	Intact
41	0	Negative	1-3	Stairs To Second Floor	Stairs	Stringer Casing	D	Wood	White	Intact
42	0	Negative	1-3	Stairs To Second Floor	Stairs	Railing	B	Metal	Black	Intact
43	0	Negative	1-3	Stairs To Second Floor		Wall	A	Drywall	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
44	0	Negative	2-1	Bathroom		Wall	B	Drywall	Beige	Intact
45	0	Negative	2-1	Bathroom		Wall	C	Drywall	Beige	Intact
46	0	Negative	2-1	Bathroom		Wall	D	Drywall	Beige	Intact
47	0	Negative	2-1	Bathroom		Ceiling	D	Drywall	Beige	Intact
48	0.01	Negative	2-1	Bathroom	Door (Entry)	Casing	C	Wood	Beige	Intact
49	0.01	Negative	2-1	Bathroom	Door (Entry)	Jamb	C	Wood	Beige	Intact
50	0	Negative	2-1	Bathroom	Door (Entry)	Door	C	Wood	Brown	Intact
51	0	Negative	2-1	Bathroom	Vanity	Door	D	Wood	Stained	Intact
52	0	Negative	2-1	Bathroom	Vanity	Cabinet	D	Wood	Stained	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
53	0	Negative	2-2	Bedroom 1		Wall	A	Drywall	Beige	Intact
54	0	Negative	2-2	Bedroom 1		Wall	B	Drywall	Beige	Intact
55	0	Negative	2-2	Bedroom 1		Wall	C	Drywall	Beige	Intact
56	0	Negative	2-2	Bedroom 1		Wall	D	Drywall	Beige	Intact
57	0	Negative	2-2	Bedroom 1		Ceiling	NA	Drywall	Beige	Intact
58	0	Negative	2-2	Bedroom 1		Baseboard	B	Wood	Beige	Intact
59	0	Negative	2-2	Bedroom 1	Door (Entry)	Casing	C	Metal	Beige	Intact
60	0.01	Negative	2-2	Bedroom 1	Door (Entry)	Jamb	C	Metal	Beige	Intact
61	0	Negative	2-2	Bedroom 1	Door (Entry)	Door	C	Wood	Brown	Intact
62	0	Negative	2-2	Bedroom 1	Door (Wall D Closet)	Door	D	Wood	Brown	Intact
63	0	Negative	2-2	Bedroom 1	Closet	Door	D	Wood	Brown	Intact
64	0	Negative	2-2	Bedroom 1	Closet	Wall	A	Wood	Brown	Intact
65	0	Negative	2-2	Bedroom 1	Closet	Shelf	D	Wood	Beige	Intact
66	0	Negative	2-2	Bedroom 1	Closet	Shelf Edge	D	Wood	Beige	Intact
67	0	Negative	2-2	Bedroom 1	Closet	Shelf Support	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
68	0	Negative	2-2	Bedroom 1	Window	Frame	A	Metal	Beige	Intact
69	0	Negative	2-3	Bedroom 2		Wall	A	Drywall	Beige	Intact
70	0	Negative	2-3	Bedroom 2		Wall	B	Drywall	Beige	Intact
71	0	Negative	2-3	Bedroom 2		Wall	C	Drywall	Beige	Intact
72	0	Negative	2-3	Bedroom 2		Wall	D	Drywall	Beige	Intact
73	0	Negative	2-3	Bedroom 2		Ceiling	D	Drywall	Beige	Intact
74	0	Negative	2-3	Bedroom 2		Baseboard	C	Wood	Beige	Intact
75	0.01	Negative	2-3	Bedroom 2	Door (Entry)	Casing	D	Metal	Beige	Intact
76	0.01	Negative	2-3	Bedroom 2	Door (Entry)	Jamb	D	Metal	Beige	Intact
77	0	Negative	2-3	Bedroom 2	Door (Entry)	Door	D	Wood	Brown	Intact
78	0	Negative	2-3	Bedroom 2	Door (Wall A Closet)	Door	A	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
79	0	Negative	2-3	Bedroom 2	Closet	Door	A	Wood	Brown	Intact
80	0	Negative	2-3	Bedroom 2	Closet	Wall	A	Drywall	Beige	Intact
81	0	Negative	2-3	Bedroom 2	Closet	Shelf	A	Wood	Beige	Intact
82	0	Negative	2-3	Bedroom 2	Closet	Shelf Edge	A	Wood	Beige	Intact
83	0	Negative	2-3	Bedroom 2	Closet	Shelf Support	A	Wood	Beige	Intact
84	0	Negative	2-3	Bedroom 2	Window	Frame	C	Metal	Beige	Intact
85	0	Negative	2-4	Bedroom 3		Wall	A	Drywall	Beige	Intact
86	0	Negative	2-4	Bedroom 3		Wall	B	Drywall	Beige	Intact
87	0	Negative	2-4	Bedroom 3		Wall	C	Drywall	Beige	Intact
88	0	Negative	2-4	Bedroom 3		Wall	D	Drywall	Beige	Intact
89	0	Negative	2-4	Bedroom 3		Ceiling	D	Drywall	Beige	Intact
90	0	Negative	2-4	Bedroom 3		Baseboard	D	Wood	Beige	Intact
91	0	Negative	2-4	Bedroom 3	Door (Entry)	Casing	A	Metal	Beige	Intact
92	0.01	Negative	2-4	Bedroom 3	Door (Entry)	Jamb	A	Metal	Beige	Intact
93	0	Negative	2-4	Bedroom 3	Door (Entry)	Door	A	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
94	0	Negative	2-4	Bedroom 3	Door Wall D Closet	Door	D	Wood	Brown	Intact
95	0.01	Negative	2-4	Bedroom 3	Closet	Door	B	Wood	Brown	Intact
96	0	Negative	2-4	Bedroom 3	Closet	Jamb	B	Metal	Beige	Intact
97	0	Negative	2-4	Bedroom 3	Closet	Casing	B	Wood	Beige	Intact
98	0	Negative	2-4	Bedroom 3	Closet	Wall	C	Drywall	Beige	Intact
99	0	Negative	2-4	Bedroom 3	Closet	Shelf	D	Wood	Beige	Intact
100	0	Negative	2-4	Bedroom 3	Closet	Shelf Edge	D	Wood	Beige	Intact
101	0	Negative	2-4	Bedroom 3	Closet	Shelf Support	C	Wood	Beige	Intact
102	0	Negative	2-4	Bedroom 3	Closet	Extra Shelf	A	Wood	Brown	Intact
103	0	Negative	2-4	Bedroom 3	Window	Frame	C	Metal	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
104	0	Negative	2-5	Hallway		Wall	A	Drywall	Beige	Intact
105	0	Negative	2-5	Hallway		Wall	B	Drywall	Beige	Intact
106	0	Negative	2-5	Hallway		Wall	C	Drywall	Beige	Intact
107	0	Negative	2-5	Hallway		Wall	D	Drywall	Beige	Intact
108	0	Negative	2-5	Hallway		Ceiling	NA	Drywall	Beige	Intact
109	0	Negative	2-5	Hallway		Baseboard	D	Wood	Beige	Intact
110	0	Negative	2-5	Hallway	Door (Wall A Closet)	Door	A	Wood	Brown	Intact
111	0	Negative	2-5	Hallway	Door (Wall A Closet)	Door	C	Wood	Brown	Intact
112	0	Negative	2-5	Hallway	Door (Wall A Closet)	Casing	C	Wood	Beige	Intact
113	0	Negative	2-5	Hallway	Door (Wall A Closet)	Shelf	A	Wood	Beige	Intact
114	0	Negative	2-5	Hallway	Closet	Shelf Edge	A	Wood	Stained	Intact
115	0	Negative	2-5	Hallway	Closet	Shelf Support	A	Wood	Beige	Intact
116	0	Negative	2-5	Hallway	Closet	Wall	A	Drywall	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
117	0	Negative	Exterior	Main Structure	Door		A	Metal	Beige	Intact
118	0	Negative	Exterior	Main Structure	Jamb	Jamb	A	Wood	White	Intact
119	0	Negative	Exterior	Main Structure	Trim	Casing	A	Wood	Beige	Intact
120	0.14	Negative	Exterior	Main Structure	Header	Header	A	Metal	Beige	Deteriorated
121	0	Negative	Exterior	Main Structure	Door		C	Metal	Beige	Intact
122	0	Negative	Exterior	Main Structure	Jamb	Jamb	C	Metal	White	Deteriorated
123	0	Negative	Exterior	Main Structure	Trim	Casing	C	Metal	Beige	Intact
124	0.16	Negative	Exterior	Main Structure	Header	Header	C	Metal	Beige	Deteriorated
125	1.05	Positive	Calibration							
126	1.1	Positive	Calibration							
127	1	Positive	Calibration							
128	1.05	Positive	Calibration							

Appendix I

Lead Hazard Control Levels/Methods

Lead Hazard Levels

Lead is hazardous, especially for children who are six years of age or younger. Lead can reduce intelligence, cause behavior and learning problems, slow growth and impair hearing. Children can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

Lead-based paint is any paint or surface coating that contains lead equal to or in excess of 1.0 milligrams per square centimeter (1.0 mg/cm^2) or equal to or in excess of 0.5% by weight. Lead-based paint is hazardous when it is:

1. On a friction surface. The paint on surfaces like window sashes and jambs can break down during normal use and release lead dust. If dust levels on the nearest flat surface exceed acceptable levels, then the friction surface is a hazard.

2. On a chewable surface that has evidence of teeth marks. These are surfaces, such as windowsills, railings, door edges that a young child can mouth or chew.

3. On an impact surface where there is damaged or otherwise deteriorated paint from impact from a related building component (such as a door frame banging together).

4. Deteriorated paint that is peeling, chipping, chalking, or cracking. When lead paint breaks down or is disturbed due to remodeling, dry scraping, or water damage; paint chips and dust can be released and easily ingested by young children through hand-to-mouth activity.

Lead Hazard Control Methods

1. Non-friction or Non-impact Surfaces. Examples include: interior or exterior walls, ceilings, trim, casings, baseboards, etc.

    a. Removal of the lead-based painted component and replacement with a lead-free component.

    b. Paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals, or certain abrasive measures either onsite or offsite.

    c. Enclosure of the lead-based painted component with durable materials. Durable materials include wallboard, drywall/plaster, paneling, siding, coil stock and the sealing or caulking of edges and joints.

    d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

    e. Paint stabilization and a written ongoing maintenance and monitoring schedule.

    f. Any other lead-safe method of permanently removing the lead hazard.

2. Friction or Impact Surfaces. Examples include window systems, doors, floors, etc.

    a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the impact surfaces with durable materials. Durable materials include wallboard, drywall/plaster, paneling, plywood, coil stock, and the sealing or caulking of edges and joints.

d. Elimination of the friction points or application of a treatment that will prevent abrasion of the friction surface and a written ongoing maintenance and monitoring schedule.

e. Any other lead-safe method of permanently removing the lead hazard.

3. Chewable Surfaces. Examples include windowsills, railings and other child-accessible surfaces that show evidence of teeth marks.

a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the lead-based painted component with a material that cannot be penetrated by a child's teeth.

d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

e. Any other lead safe method of permanently removing the lead hazard.

The following practices are **PROHIBITED**:

1. Open flame burning or torching.

2. Machine sanding or grinding without a HEPA local vacuum exhaust tool.

3. Abrasive blasting or sandblasting without a HEPA local vacuum exhaust tool.

4. Use of a heat gun operating above one thousand one hundred degrees Fahrenheit.

5. Charring paint.

6. Dry sanding.

7. Dry scraping, except when done as follows:

a. In conjunction with a heat gun operating at not more than one thousand one hundred degrees Fahrenheit.

b. Within one foot of an electrical outlet.

c. To treat defective paint spots totaling not more than two square feet in an interior room or space or eleven square feet on an exterior surface.

8. Uncontained hydroblasting or high-pressure washing.

9. Paint stripping in a poorly ventilated space using a volatile stripper that is considered a hazardous substance under 16 C.F.R. 1500.3 or a hazardous chemical under 29 C.F.R. 1910.1200 or 29 C.F.R. Pre-1960.59 in the type of work being performed.

Important Notes:

1. Residents, especially children and pregnant women, must be kept away from the lead hazard control area. Proper and thorough cleanup is important so that dust and paint chips are not left behind at the end of the job.

2. After lead hazard control work is done, the home must pass a clearance examination, typically including dust wipe samples.

3. Paint stabilization, interim window treatments, and impermanent covering of lead-contaminated soil require a written ongoing maintenance and monitoring schedule and an annual clearance examination. It is recommended that a visual check of past repairs involving painted surfaces be done annually and at unit turnover.

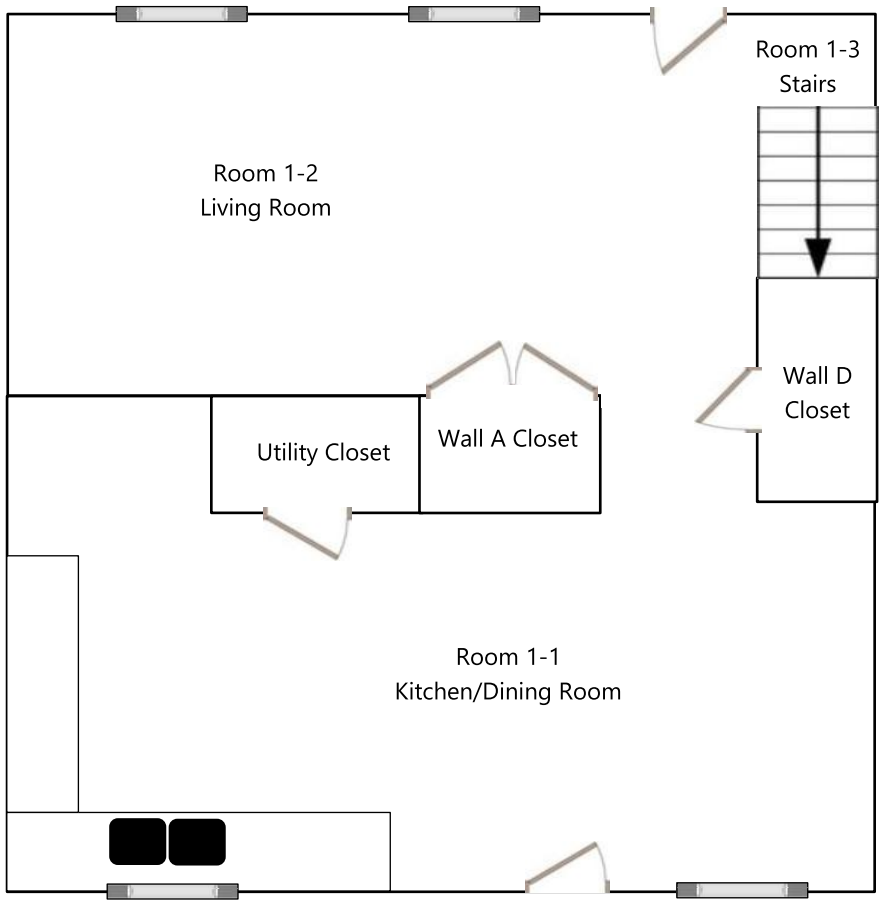
4. Other surfaces that measured below hazard limits should also be addressed to prevent them from becoming hazardous. It is recommended that lead-safe work practices be used when such surfaces are repaired or replaced.

Appendix II

Diagrams

1006 Robinson Drive
First Floor Plan

Side C



Side B

Side D

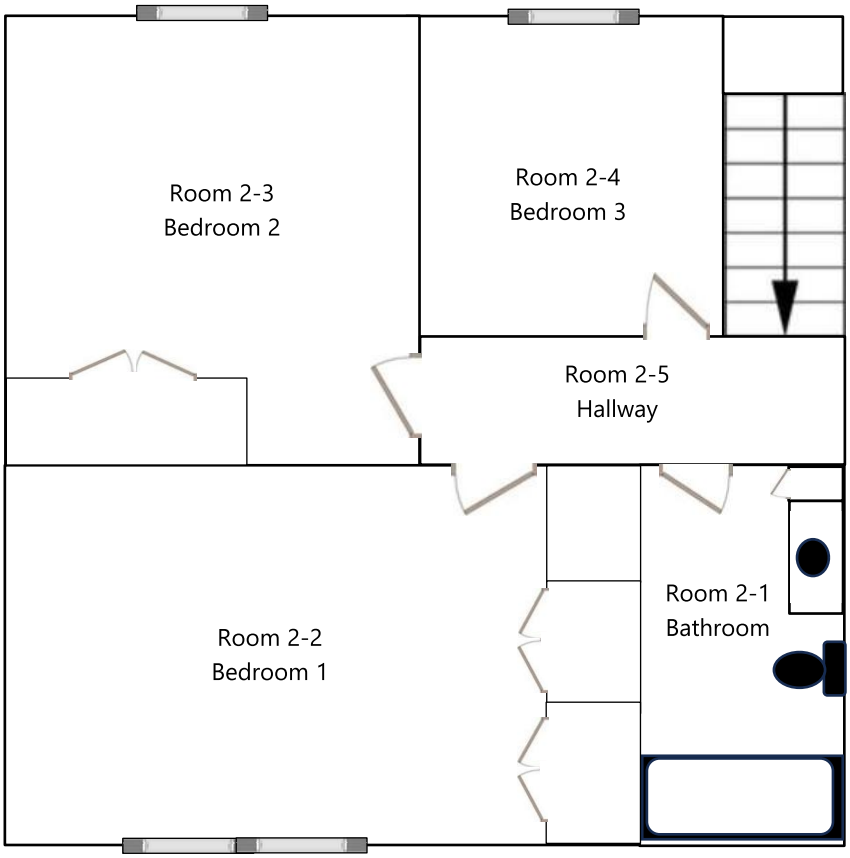
Side A

N

Property: 1006 Robinson Drive Springfield, Ohio 45506	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

1006 Robinson Drive
Second Floor Plan

Side C



Side B

Side D

Side A

Property: 1006 Robinson Drive Springfield, Ohio 45506	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

Appendix III

Lead Risk Assessor Certification

Ohio | Department of Health

Mike DeWine, Governor
Jon Husted, Lt.Governor

Bruce Vanderhoff, MD, MBA, Director

October 09, 2024

Thomas E Wenk
319 Shawnee Trail
Dayton OK 45458

RE: Lead Risk Assessor
License Number: LA000898
Expiration Date: 10/09/2026

Dear Thomas E Wenk:

This letter and enclosed license approves your request to be licensed as a Lead Risk Assessor. You must present your license upon request at any project site while performing duties. A copy of your license is not acceptable as proof of licensure.

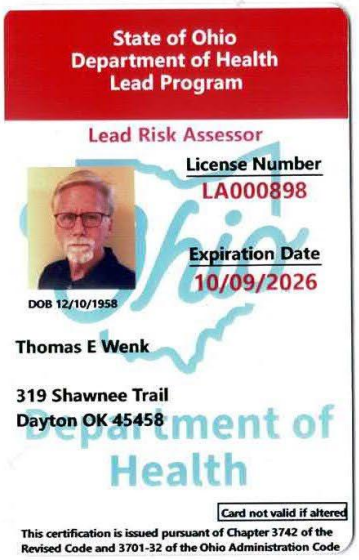
Please be aware of the rules and regulations governing your discipline for Ohio. If you choose to renew this license, you must take an Ohio approved refresher course appropriate for the discipline within your current two year licensure period. Renewal applications must be submitted prior to the expiration of your current license to avoid additional reinstatement fees. Please visit our website at www.odh.ohio.gov for information.

This license may be revoked by the Director of Health for violation of any of the requirements of 3701-32 of the Ohio Administrative Code.

If you have any questions, please call the Ohio Department of Health, Lead Poisoning Prevention Program at (614) 466-1450.

Sincerely,

Shamus Estep
Program Administrator
Bureau of Environmental Health and Radiation Protection



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Cincinnati

3959 Fulton Grove Rd.
Cincinnati, Ohio 45245
(513) 752-9111

Services

Phase I ESA's
Phase II Investigations
Asbestos
Lead-Based Paint
Industrial Hygiene
Indoor Air Quality/Mold
Radon
Safety
Training

Lead-Based Paint Inspection

563 East Northern Avenue
Springfield, Ohio 45503

Year of Construction: Pre 1978

Prepared for:

Springfield Metropolitan Housing Authority
2026 West High Street
Springfield, Ohio 45502
(937) 325-7331

Prepared by:

m.a.c. Paran Consulting Services, Inc.

Tom Wenk
Ohio Lead Risk Assessor: LA-000898

Michelle Paraniuk, M.S., President

December 2025

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3.0 Observations/Limitations to the Inspection 1

4.0 Previous Lead Inspection/Risk Assessment History 2

5.0 Lead Paint Results 2

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Appendix II Diagrams
Appendix III Lead Risk Assessor Certification

1.0 Disclosure Requirements for Residential Units

Ohio law (Section 5302.30 of the Revised Code) requires every person who intends to transfer any residential real property by sale, land installment contract, lease with the option to purchase, exchange, or lease for a term of ninety-nine years and renewable forever, to complete and provide a copy to the prospective transferee of the applicable property disclosure forms, disclosing known hazardous conditions of the property, including lead-based paint hazards.

Federal law (24 CFR part 35 and 40 CFR part 745) requires sellers and lessors of residential units constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than six years of age resides or is expected to reside in such housing) or any zero-bedroom dwelling to disclose and provide a copy of this report to new purchasers or lessees before they become obligated under a lease or sales contract. Property owners and sellers are also required to distribute an educational pamphlet approved by the United States Environmental Protection Agency (EPA) and include standard warning language in sales contracts or in or attached to lease contracts to ensure that parents have the information they need to protect children from lead-based paint hazards.

2.0 Executive Summary

On December 13, 2025, a lead-based paint inspection was conducted of the residential structure located at 563 East Northern Avenue, Springfield, Ohio 45503. The inspection included:

- ✓ Visual assessment of paint condition
- ✓ Use of a portable X-ray fluorescence (XRF) analyzer to test for lead in paint.

Two hundred sixty-eight (268) readings (including calibration readings) were collected from the interior and exterior of the structure. Refer to Table 1 for a listing of all readings collected. Refer to Table 2 for a list of positive readings.

3.0 Observations/Limitations to the Inspection

The structure was observed to be in fair condition. The following limitations were encountered during the inspection:

Observation/Limitation	Presumed Positive
Upper structural elements were not tested	Yes
Cove base was located in various areas	No

4.0 Previous Lead Inspection/Risk Assessment History

No prior report was made available for review.

5.0 Lead Paint Results

An X-Ray Fluorescence (XRF) Lead Analyzer was used to test the paint for lead. This analyzer is a non-destructive method for testing paint, providing immediate results for each test conducted.

XRF Manufacturer:	SciAps
XRF Device/Serial Number:	Model X-550 No. 02091
XRF Operator:	Tom Wenk
Operator License Number:	LA-000898
Inspection Date:	December 13, 2025
Inspection Site:	563 East Northern Avenue Springfield, Ohio 45503

Paint containing lead equal to or greater than 1.0 mg/cm^2 is considered to be lead-based paint per the Department of Housing and Urban Development (HUD) and EPA definitions. This is of importance should the property be renovated into residential units. Building components in a room that are similar in construction history to those that tested positive for lead are considered positive for lead.

Paint conditions:

- ✓ Intact: Entire surface area is judged to be intact. Intact surfaces may or may not have been tested and need only monitoring.
- ✓ Deteriorated: shows any sign of abrasion and/or is peeling, chipping, chalking, or cracking, or otherwise damaged or separated from the substrate.

The following table represents readings collected during the assessment. **Readings that are highlighted in red represent coatings containing lead equal to or exceeding 1.0 mg/cm^2 (i.e., lead-based coating per HUD/EPA definition).**

Table 1: XRF Results Table

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
1	1	Positive	Calibration							
2	1.04	Positive	Calibration							
3	1.03	Positive	Calibration							
4	1.02	Positive	Calibration							
5	0.01	Negative	1-1	Living Room		Wall	A	Plaster	Beige	Intact
6	0	Negative	1-1	Living Room		Wall	B	Plaster	Beige	Intact
7	0	Negative	1-1	Living Room		Wall	C	Plaster	Beige	Intact
8	0	Negative	1-1	Living Room		Wall	D	Plaster	Beige	Intact
9	0.01	Negative	1-1	Living Room		Ceiling	Cntr.	Plaster	Beige	Intact
10	0.04	Negative	1-1	Living Room		Baseboard	A	Wood	Beige	Intact
11	0.08	Negative	1-1	Living Room		Baseboard	B	Wood	Beige	Intact
12	0.14	Negative	1-1	Living Room		Baseboard	C	Wood	Beige	Intact
13	0.06	Negative	1-1	Living Room		Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
14	0	Negative	1-1	Living Room	Door (Entry)	Casing	A	Wood	Beige	Intact
15	0	Negative	1-1	Living Room	Door (Entry)	Jamb	A	Wood	Beige	Intact
16	0	Negative	1-1	Living Room	Door (Entry)		A	Metal	Beige	Intact
17	0.21	Negative	1-1	Living Room	Window	Casing	A	Wood	Beige	Intact
18	0.18	Negative	1-1	Living Room	Window	Sill	A	Wood	Beige	Intact
19	0.16	Negative	1-1	Living Room	Window	Apron	A	Wood	Beige	Intact
20	0.23	Negative	1-1	Living Room	Fireplace	Casing	B	Wood	Beige	Intact
21	0	Negative	1-1	Living Room	Fireplace	Façade	B	Drywall	Beige	Intact
22	0	Negative	1-2	Dining Room		Wall	A	Plaster	Beige	Intact
23	0	Negative	1-2	Dining Room		Wall	B	Plaster	Beige	Intact
24	0	Negative	1-2	Dining Room		Wall	C	Plaster	Beige	Intact
25	0	Negative	1-2	Dining Room		Wall	D	Plaster	Beige	Intact
26	0.02	Negative	1-2	Dining Room		Ceiling	Cntr.	Plaster	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
27	0.14	Negative	1-2	Dining Room		Baseboard	A	Wood	Beige	Intact
28	0.08	Negative	1-2	Dining Room		Baseboard	B	Wood	Beige	Intact
29	0.08	Negative	1-2	Dining Room		Baseboard	C	Wood	Beige	Intact
30	0.06	Negative	1-2	Dining Room		Baseboard	D	Wood	Beige	Intact
31	0	Negative	1-2	Dining Room	Doorway (To Kitchen)	Casing	D	Wood	Beige	Intact
32	0	Negative	1-2	Dining Room	Doorway (To Kitchen)	Jamb	D	Wood	Beige	Intact
33	0	Negative	1-2	Dining Room	Door (Wall D Closet)	Door	D	Wood	Brown	Intact
34	0.1	Negative	1-2	Dining Room	Door (Wall D Closet)	Casing (Left Front)	D	Wood	Beige	Intact
35	0.05	Negative	1-2	Dining Room	Door (Wall D Closet)	Casing (Left Edge)	D	Wood	Beige	Intact
36	0.13	Negative	1-2	Dining Room	Door (Wall D Closet)	Casing (Right Side)	D	Wood	Beige	Intact
37	0.1	Negative	1-2	Dining Room	Window	Casing	B	Wood	Beige	Intact
38	0.2	Negative	1-2	Dining Room	Window	Sill	B	Wood	Beige	Intact
39	0.04	Negative	1-2	Dining Room	Window	Apron	B	Wood	Beige	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
40	0	Negative	1-2	Dining Room	Closet	Door	D	Wood	Brown	Intact
41	1.56	Positive	1-2	Dining Room	Closet	Jamb	D	Wood	Beige	Intact
42	3.55	Positive	1-2	Dining Room	Closet	Casing Inside Closet	D	Wood	Beige	Intact
43	0.03	Negative	1-2	Dining Room	Closet	Wall	D	Plaster	Beige	Intact
44	3.84	Positive	1-2	Dining Room	Closet	Shelf	D	Wood	Beige	Intact
45	0.06	Negative	1-2	Dining Room	Closet	Shelf Support	D	Wood	Beige	Intact
46	0.06	Negative	1-2	Dining Room	Closet	Baseboard	D	Wood	Beige	Intact
47	0.07	Negative	1-2	Dining Room	Closet	Baseboard	A	Wood	Beige	Intact
48	0.06	Negative	1-2	Dining Room	Closet	Baseboard	B	Wood	Beige	Intact
49	0.23	Negative	1-2	Dining Room	Closet	Baseboard	C	Wood	Beige	Intact
50	0.11	Negative	1-2	Dining Room	Closet	Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
51	0	Negative	1-3	Kitchen		Wall	A	Plaster	Beige	Intact
52	0	Negative	1-3	Kitchen		Wall	B	Plaster	Beige	Intact
53	0	Negative	1-3	Kitchen		Wall	C	Plaster	Beige	Intact
54	0	Negative	1-3	Kitchen		Wall	D	Plaster	Beige	Intact
55	0	Negative	1-3	Kitchen		Ceiling	Cntr.	Plaster	Beige	Intact
56	2.18	Positive	1-3	Kitchen		Baseboard	D	Wood	Beige	Intact
57	0	Negative	1-3	Kitchen		Baseboard	A	Wood	Beige	Intact
58	0	Negative	1-3	Kitchen		Baseboard	B	Wood	Beige	Intact
59	0	Negative	1-3	Kitchen		Baseboard	C	Wood	Beige	Intact
60	2.07	Positive		Kitchen		Baseboard	D	Wood	Beige	Intact
61	0	Negative	1-3	Kitchen	Door (Back Entry)	Casing	C	Wood	Beige	Intact
62	0	Negative	1-3	Kitchen	Door (Back Entry)	Jamb	C	Wood	Beige	Intact
63	0	Negative	1-3	Kitchen	Door (Back Entry)		C	Metal	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
64	0.9	Negative	1-3	Kitchen	Window	Casing	D	Wood	Beige	Intact
65	0.57	Negative	1-3	Kitchen	Window	Sill	D	Wood	Beige	Intact
66	0.14	Negative	1-3	Kitchen	Window	Apron	D	Wood	Beige	Intact
67	0	Negative	1-3	Kitchen	Cabinets	Door	C	Wood	Stained	Intact
68	0	Negative	1-3	Kitchen	Cabinets	Cabinet	C	Wood	Stained	Intact
69	0	Negative	1-3	Kitchen	Door (Wall A To Basement)	Door	A	Wood	Brown	Intact
70	0	Negative	1-3	Kitchen	Door (Wall A To Basement)	Casing (Right) In Kitchen	A	Wood	Beige	Intact
71	0.93	Negative	1-3	Kitchen	Door (Wall A To Basement)	Casing (Left) In Kitchen	A	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
72	0.11	Negative	B-1	Stairs to Basement	Stairs	Wall	B	Plaster	Beige	Intact
73	0.12	Negative	B-1	Stairs to Basement	Stairs	Wall	D	Plaster	Beige	Intact
74	0.09	Negative	B-1	Stairs to Basement	Stairs	Ceiling	Cntr.	Plaster	Beige	Intact
75	0.15	Negative	B-1	Stairs to Basement	Stairs	Tread	B	Wood	Grey	Intact
76	0.24	Negative	B-1	Stairs to Basement	Stairs	Riser	D	Wood	Grey	Intact
77	0.28	Negative	B-1	Stairs to Basement	Stairs	Stringer	B	Wood	Grey	Intact
78	2.74	Positive	B-1	Stairs to Basement	Stairs	Joist (Base of Wall)	B	Wood	Beige	Intact
79	0	Negative	B-1	Stairs to Basement	Stairs	Handrail	B	Wood	Grey	Intact
80	1.89	Positive	B-1	Stairs to Basement	Stairs	Joist (Base of Wall)	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
81	0	Negative	B-1	Stairs to Basement	Door (Side D Entry)	Casing	D	Wood	Beige	Intact
82	0	Negative	B-1	Stairs to Basement	Door (Side D Entry)	Jamb	D	Wood	Beige	Intact
83	0	Negative	B-1	Stairs to Basement	Door (Side D Entry)		D	Metal	Beige	Intact
84	4.11	Positive	B-1	Stairs to Basement	Door (Side C to Kitchen)	Casing	C	Wood	Beige	Intact
85	2.74	Positive	B-1	Stairs to Basement	Door (Side C to Kitchen)	Jamb	C	Wood	Beige	Intact
86	0	Negative	B-1	Stairs to Basement	Door (Side C to kitchen)	Door To Kitchen	C	Wood	Brown	Intact
87	0	Negative	B-2	Basement		Wall	A	Concrete	White	Intact
88	0	Negative	B-2	Basement		Wall	B	Concrete	White	Intact
89	0	Negative	B-2	Basement		Wall	C	Concrete	White	Intact
90	0	Negative	B-2	Basement		Wall	D	Concrete	White	Intact
91	0	Negative	B-2	Basement		Ceiling	Cntr.	Plaster	Beige	Intact
92	0.12	Negative	B-2	Basement		Floor	Cntr.	Concrete	Grey	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
93	0.07	Negative	B-2	Basement	Cabinets	Door	D	Wood	Grey	Intact
94	0.14	Negative	B-2	Basement	Cabinets	Casing	D	Wood	Grey	Intact
95	5.76	Positive	B-2	Basement		Post	Cntr.	Wood	White	Deteriorated
96	0	Negative	1-4	Stairs to Second Floor	Stair	Wall	B	Plaster	Beige	Intact
97	0	Negative	1-4	Stairs to Second Floor	Stair	Wall	D	Plaster	Beige	Intact
98	0.02	Negative	1-4	Stairs to Second Floor	Stair	Tread	C	Wood	Stained	Intact
99	0.13	Negative	1-4	Stairs to Second Floor	Stair	Riser	C	Wood	Grey	Intact
100	0.09	Negative	1-4	Stairs to Second Floor	Stair	Stringer	B	Wood	Beige	Intact
101	0.08	Negative	1-4	Stairs to Second Floor	Stair	Newel Post	A	Wood	Beige	Intact
102	0.14	Negative	1-4	Stairs to Second Floor	Stair	Balustrade	B	Wood	Beige	Intact
103	0.1	Negative	1-4	Stairs to Second Floor	Stair	Stringer	B	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
104	0.09	Negative	1-4	Stairs to Second Floor	Stair	Rail	B	Wood	Beige	Intact
105	0.02	Negative	1-4	Stairs to Second Floor	Stair	Rail	B	Wood	Beige	Intact
106	0	Negative	2-1	Hallway		Wall	A	Plaster	Beige	Intact
107	0	Negative	2-1	Hallway		Wall	B	Plaster	Beige	Intact
108	0	Negative	2-1	Hallway		Wall	C	Plaster	Beige	Intact
109	0	Negative	2-1	Hallway		Wall	D	Plaster	Beige	Intact
110	0.01	Negative	2-1	Hallway		Ceiling	Cntr.	Plaster	Beige	Intact
111	0.05	Negative	2-1	Hallway		Baseboard	A	Wood	Beige	Intact
112	0.05	Negative	2-1	Hallway		Baseboard	C	Wood	Beige	Intact
113	0.05	Negative	2-1	Hallway		Baseboard	D	Wood	Beige	Intact
114	0.05	Negative	2-1	Hallway	Door (Side A To Bedroom 1)	Casing	A	Wood	Beige	Intact
115	0	Negative	2-1	Hallway	Door (Side A To Bedroom 1)		A	Wood	Brown	Intact
116	0.04	Negative	2-1	Hallway	Door (Side A To Bedroom 2)	Stop	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
117	0.25	Negative	2-4	Hallway	Door (Side C To Bedroom 3)	Casing Outside Room	C	Wood	Beige	Intact
118	0.12	Negative	2-1	Hallway	Door (Side C To Bathroom)	Casing Outside Bathroom	A	Wood	Beige	Intact
119	0.08	Negative	2-1	Hallway	Window	Casing	D	Wood	Beige	Intact
120	0.09	Negative	2-1	Hallway	Window	Sill	D	Wood	Beige	Deteriorated
121	0.09	Negative	2-1	Hallway	Window	Apron	D	Wood	Beige	Intact
122	0.1	Negative	2-1	Hallway	Window	Stop	D	Wood	Beige	Intact
123	0.06	Negative	2-2	Bedroom 1		Wall	A	Plaster	Beige	Intact
124	0	Negative	2-2	Bedroom 1		Wall	B	Plaster	Beige	Intact
125	0	Negative	2-2	Bedroom 1		Wall	C	Plaster	Beige	Intact
126	0.01	Negative	2-2	Bedroom 1		Wall	D	Plaster	Beige	Intact
127	0.04	Negative	2-2	Bedroom 1		Ceiling	Cntr	Plaster	Beige	Intact
128	0.06	Negative	2-2	Bedroom 1		Baseboard	A	Wood	Beige	Intact
129	0.03	Negative	2-2	Bedroom 1		Baseboard	B	Wood	Beige	Intact
130	0.06	Negative	2-2	Bedroom 1		Baseboard	C	Wood	Beige	Intact
131	0.07	Negative	2-2	Bedroom 1		Baseboard	D	Wood.	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
132	0.02	Negative	2-2	Bedroom 1	Door (Entry)	Casing	C	Wood	Beige	Intact
133	0.06	Negative	2-2	Bedroom 1	Door (Entry)	Jamb	C	Wood	Beige	Intact
134	0	Negative	2-2	Bedroom 1	Door (Entry)		C	Wood	Brown	Intact
135	0	Negative	2-2	Bedroom 1	Door (Wall D Closet)	Door	D	Wood	Brown	Intact
136	0.12	Negative	2-2	Bedroom 1	Door (Wall D Closet)	Casing	D	Wood	Beige	Intact
137	0.02	Negative	2-2	Bedroom 1	Window	Casing	A	Wood	Beige	Intact
138	0.15	Negative	2-2	Bedroom 1	Window	Sill	A	Wood	Beige	Intact
139	0.02	Negative	2-2	Bedroom 1	Window	Apron	A	Wood	Beige	Intact
140	0.02	Negative	2-2	Bedroom 1	Window	Stop	A	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
141	0	Negative	2-2	Bedroom 1	Closet	Door	D	Wood	Brown	Intact
142	0.07	Negative	2-2	Bedroom 1	Closet	Jamb	D	Wood	Beige	Intact
143	0	Negative	2-2	Bedroom 1	Closet	Casing Inside Closet	D	Wood	Beige	Intact
144	0.07	Negative	2-2	Bedroom 1	Closet	Baseboard	D	Wood	Beige	Intact
145	0	Negative	2-2	Bedroom 1	Closet	Wall	D	Plaster	Beige	Intact
146	0	Negative	2-2	Bedroom 1	Closet	Shelf	D	Wood	Beige	Intact
147	0.01	Negative	2-2	Bedroom 1	Closet	Shelf Support	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
148	0	Negative	2-3	Bedroom 2		Wall	A	Plaster	Beige	Intact
149	0	Negative	2-3	Bedroom 2		Wall	B	Plaster	Beige	Intact
150	0	Negative	2-3	Bedroom 2		Wall	C	Plaster	Beige	Intact
151	0	Negative	2-3	Bedroom 2		Wall	D	Plaster	Beige	Intact
152	0	Negative	2-3	Bedroom 2		Ceiling	Cntr.	Plaster	Beige	Intact
153	0.09	Negative	2-3	Bedroom 2		Baseboard	A	Wood	Beige	Intact
154	0.05	Negative	2-3	Bedroom 2		Baseboard	B	Wood	Beige	Intact
155	0.05	Negative	2-3	Bedroom 2		Baseboard	C	Wood	Beige	Intact
156	0.16	Negative	2-3	Bedroom 2		Baseboard	D	Wood	Beige	Intact
157	0.03	Negative	2-3	Bedroom 2	Door (Entry)	Casing	C	Wood	Beige	Intact
158	0.06	Negative	2-3	Bedroom 2	Door (Entry)	Jamb	C	Wood	Beige	Intact
159	0	Negative	2-3	Bedroom 2	Door (Entry)		C	Wood	Brown	Intact
160	0.03	Negative	2-3	Bedroom 2	Door (Wall C Closet)		C	Wood	Brown	Intact
161	0.01	Negative	2-3	Bedroom 2	Door (Wall C Closet)	Casing	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
162	0.15	Negative	2-3	Bedroom 2	Window	Casing	A	Wood	Beige	Intact
163	0.03	Negative	2-3	Bedroom 2	Window	Sill	A	Wood	Beige	Intact
164	0.06	Negative	2-3	Bedroom 2	Window	Apron	A	Wood	Beige	Intact
165	0.08	Negative	2-3	Bedroom 2	Window	Stop	A	Wood	Beige	Intact
166	0	Negative	2-3	Bedroom 2	Closet	Door	C	Wood	Brown	Intact
167	0.03	Negative	2-3	Bedroom 2	Closet	Stop (on Jamb)	C	Wood	Beige	Intact
168	0.2	Negative	2-3	Bedroom 2	Closet	Jamb	C	Wood	Beige	Intact
169	0.06	Negative	2-3	Bedroom 2	Closet	Casing	C	Wood	Beige	Intact
170	0	Negative	2-3	Bedroom 2	Closet	Shelf Support	C	Wood	Beige	Intact
171	0	Negative	2-3	Bedroom 2	Closet	Wall	C	Plaster	Beige	Intact
172	0	Negative	2-3	Bedroom 2	Closet	Wall	A	Plaster	Beige	Intact
173	0.03	Negative	2-3	Bedroom 2	Stairs to Attic in Closet	Tread	D	Wood	Beige	Intact
174	0.02	Negative	2-3	Bedroom 2	Stairs to Attic in Closet	Riser	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
175	0.07	Negative	2-3	Bedroom 2	Window	Casing	B	Wood	Beige	Intact
176	0.29	Negative	2-3	Bedroom 2	Window	Sill	B	Wood	Beige	Intact
177	0.09	Negative	2-3	Bedroom 2	Window	Apron	B	Wood	Beige	Intact
178	0.05	Negative	2-3	Bedroom 2	Window	Stop	B	Wood	Beige	Intact
179	0	Negative	2-4	Bedroom 3		Wall	A	Plaster	Beige	Intact
180	0	Negative	2-4	Bedroom 3		Wall	B	Plaster	Beige	Intact
181	0	Negative	2-4	Bedroom 3		Wall	C	Plaster	Beige	Intact
182	0	Negative	2-4	Bedroom 3		Wall	D	Plaster	Beige	Intact
183	0	Negative	2-4	Bedroom 3		Ceiling	Cntr.	Plaster	Beige	Intact
184	0.08	Negative	2-4	Bedroom 3		Baseboard	A	Wood	Beige	Intact
185	0.1	Negative	2-4	Bedroom 3		Baseboard	B	Wood	Beige	Intact
186	0.11	Negative	2-4	Bedroom 3		Baseboard	C	Wood	Beige	Intact
187	0.1	Negative	2-4	Bedroom 3		Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
188	0	Negative	2-4	Bedroom 3	Door (Entry)	Casing Inside Room	A	Wood	Beige	Intact
189	0.05	Negative	2-4	Bedroom 3	Door (Entry)	Jamb	A	Wood	Beige	Intact
190	0.04	Negative	2-4	Bedroom 3	Door (Entry)	Stop (on Jamb)	A	Wood	Beige	Intact
191	0.04	Negative	2-4	Bedroom 3	Door (Entry)		A	Wood	Brown	Intact
192	0	Negative	2-4	Bedroom 3	Door (Wall D Closet)		D	Wood	Brown	Intact
193	0.01	Negative	2-4	Bedroom 3	Door (Wall D Closet)	Casing Outside Closet	D	Wood	Beige	Intact
194	0.24	Negative	2-4	Bedroom 3	Window	Casing	C	Wood	Beige	Intact
195	0.3	Negative	2-4	Bedroom 3	Window	Sill	C	Wood	Beige	Intact
196	0.08	Negative	2-4	Bedroom 3	Window	Apron	C	Wood	Beige	Intact
197	0.01	Negative	2-4	Bedroom 3	Window	Stop	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
198	0	Negative	2-4	Bedroom 3	Closet	Door	D	Wood	Brown	Intact
199	0.05	Negative	2-4	Bedroom 3	Closet	Stop (On Jamb)	D	Wood	Beige	Intact
200	0.04	Negative	2-4	Bedroom 3	Closet	Jamb	D	Wood	Beige	Intact
201	0.14	Negative	2-4	Bedroom 3	Closet	Casing Inside Closet	D	Wood	Beige	Intact
202	0	Negative	2-4	Bedroom 3	Closet	Wall	C	Plaster	Beige	Intact
203	0	Negative	2-4	Bedroom 3	Closet	Shelf	D	Wood	Beige	Intact
204	0	Negative	2-4	Bedroom 3	Closet	Shelf Edge	D	Wood	Beige	Intact
205	0.01	Negative	2-4	Bedroom 3	Closet	Shelf Support	D	Wood	Beige	Intact
206	0.03	Negative	2-4	Bedroom 3	Closet	Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
207	0	Negative	2-5	Bathroom		Wall	A	Plaster	Beige	Intact
208	0	Negative	2-5	Bathroom		Wall	B	Plaster	Beige	Intact
209	0	Negative	2-5	Bathroom		Wall	C	Plaster	Beige	Intact
210	0	Negative	2-5	Bathroom		Wall	D	Plaster	Beige	Intact
211	0	Negative	2-5	Bathroom		Ceiling	Cntr.	Plaster	Beige	Intact
212	4.58	Positive	2-5	Bathroom		Baseboard	A	Wood	Beige	Intact
213	2.53	Positive	2-5	Bathroom		Baseboard	C	Wood	Beige	Intact
214	4.22	Positive	2-5	Bathroom		Baseboard	D	Wood	Beige	Intact
215	2.64	Positive	2-5	Bathroom	Door (Entry)	Casing	A	Wood	Beige	Intact
216	2.74	Positive	2-5	Bathroom	Door (Entry)	Jamb	A	Wood	Beige	Intact
217	0.06	Negative	2-5	Bathroom	Door (Entry)	Stop (on Jamb)	A	Wood	Beige	Intact
218	0	Negative	2-5	Bathroom	Door (Entry)	Door	A	Wood	Brown	Intact
219	7.77	Positive	2-5	Bathroom	Door (Wall D Closet)	Casing Outside Closet	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
220	4.18	Positive	2-5	Bathroom	Window	Casing	D	Wood	Beige	Intact
221	3.09	Positive	2-5	Bathroom	Window	Sill	D	Wood	Beige	Intact
222	4.42	Positive	2-5	Bathroom	Window	Stop	D	Wood	Beige	Intact
223	0	Negative	2-5	Bathroom	Vanity	Door	B	Wood	Brown	Intact
224	0	Negative	2-5	Bathroom	Vanity	Cabinet	B	Wood	Stained	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
225	0	Negative	2-5	Bathroom	Closet	Door	D	Wood	Brown	Intact
226	2.9	Positive	2-5	Bathroom	Closet	Jamb	D	Wood	Beige	Intact
227	4.26	Positive	2-5	Bathroom	Closet	Stop (on Jamb)	D	Wood	Beige	Intact
228	2.28	Positive	2-5	Bathroom	Closet	Casing Inside Closet	D	Wood	Beige	Intact
229	0.02	Negative	2-5	Bathroom	Closet	Shelf Lower Shelf	D	Wood	Beige	Intact
230	0.18	Negative	2-5	Bathroom	Closet	Shelf Edge	D	Wood	Beige	Intact
231	0.08	Negative	2-5	Bathroom	Closet	Shelf Upper	A	Wood	Beige	Intact
232	0.01	Negative	2-5	Bathroom	Closet	Shelf Middle	B	Wood	Beige	Intact
233	8.39	Positive	2-5	Bathroom	Closet	Shelf Support	D	Wood	Beige	Intact
234	0.09	Negative	2-5	Bathroom	Closet	Wall	D	Plaster	Beige	Intact
235	7.67	Positive	2-5	Bathroom	Closet	Baseboard	D	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
236	0.39	Negative	Exterior	Main Structure Side A	Front Porch	Wall	A	Vinyl Over Wood	White	Intact
237	2.99	Positive	Exterior	Main Structure Side A	Front Porch	Ceiling	Cntr.	Plaster	Beige	Intact
238	0	Negative	Exterior	Main Structure Side A	Front Porch	Floor	Cntr.	Concrete	Beige /Grey	Intact
239	0	Negative	Exterior	Main Structure Side A	Door (Entry)	Casing	A	Metal Over Wood	White	Intact
240	0	Negative	Exterior	Main Structure Side A	Door (Entry)	Jamb	A	.Wood	Beige	Intact
241	0	Negative	Exterior	Main Structure Side A	Door (Entry)		A	Metal	Beige	Intact
242	0	Negative	Exterior	Main Structure Side A	Door (Storm)	Storm Door	A	Metal	White	Intact
243	8.12	Positive	Exterior	Main Structure Side A	Window	Casing	A	Metal Over Wood	White	Intact
244	8.95	Positive	Exterior	Main Structure Side A	Window	Sill	A	Vinyl Over Wood	White	Intact
245	5.76	Positive	Exterior	Main Structure Side A	Front Porch	Beam (Perimeter of Roof)	A	Wood	White	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
246	0	Negative	Exterior	Main Structure Side A	Front Porch	Railing	A	Metal	Black	Intact
247	0	Negative	Exterior	Main Structure Side A	Front Porch	Posts/ Columns	A	Metal	Black	Intact
248	3.58	Positive	Exterior	Main Structure Side B		Wall	B	Vinyl Over Assumed Wood	White	Intact
249	>10	Positive	Exterior	Main Structure Side B	Window	Casing	B	Metal Over Assumed Wood	White	Intact
250	3.27	Positive	Exterior	Main Structure Side B	Window	Sill	B	Vinyl Over Assumed Wood	White	Intact
251	0.38	Negative	Exterior	Main Structure Side B		Wall	C	Vinyl Over Wood	White	Intact
252	0.2	Negative	Exterior	Main Structure Side B		Wall	C	Vinyl Over Wood	White	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
253	0.01	Negative	Exterior	Main Structure Side C		Casing	C	Metal Over Wood	White	Intact
254	0	Negative	Exterior	Main Structure Side C		Jamb	C	Wood	Beige	Intact
255	0	Negative	Exterior	Main Structure Side C		Door	C	Metal	Beige	Intact
256	0	Negative	Exterior	Main Structure Side C		Storm Door	C	Metal	White	Intact
257	5.38	Positive	Exterior	Main Structure Side C	Window	Casing	C	Metal Over Assumed Wood	White	Intact
258	1.54	Positive	Exterior	Main Structure Side C	Window	Sill	C	Vinyl Over Assumed Wood	White	Intact
259	0.01	Negative	Exterior	Main Structure Side C		Railing	C	Metal	Black	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
260	2.75	Positive	Exterior	Main Structure Side D		Wall	D	Vinyl Over Assumed Wood	White	Intact
261	9.36	Positive	Exterior	Main Structure Side D	Window	Casing	D	Metal Over Assumed Wood	White	Intact
262	7.31	Positive	Exterior	Main Structure Side D	Window	Sill	D	Vinyl Over Assumed Wood	White	Intact
263	3.6	Positive	Exterior	Main Structure Side D	Door (Entry)	Casing	D	Metal Over Assumed Wood	White	Intact
264	0	Negative	Exterior	Main Structure Side D	Door (Entry)		D	Metal	Beige	Intact
265	1.04	Positive	Calibration							
266	1.08	Positive	Calibration							
267	1.02	Positive	Calibration							
268	1.05	Positive	Calibration							

Table 2: XRF Results Table of Positive Readings

XRF Reading (mg/cm2)	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition	Recommendation
1.56	1-2	Dining Room	Closet	Jamb	D	Wood	Beige	Intact	Maintain in intact condition
3.55	1-2	Dining Room	Closet	Casing Inside Closet	D	Wood	Beige	Intact	Maintain in intact condition
3.84	1-2	Dining Room	Closet	Shelf	D	Wood	Beige	Intact	Maintain in intact condition
2.18	1-3	Kitchen		Baseboard	D	Wood	Beige	Intact	Maintain in intact condition
2.07	1-3	Kitchen		Baseboard	D	Wood	Beige	Intact	Maintain in intact condition
2.74	B-1	Stairs To Basement	Stairs	Joist (Base of Wall)	B	Wood	Beige	Intact	Maintain in intact condition
1.89	B-1	Stairs To Basement	Stairs	Joist (Base of Wall)	D	Wood	Beige	Intact	Maintain in intact condition
4.11	B-1	Stairs To Basement	Door (Side C To Kitchen)	Casing	C	Wood	Beige	Intact	Maintain in intact condition
2.74	B-1	Stairs To Basement	Door (Side C To Kitchen)	Jamb	C	Wood	Beige	Intact	Maintain in intact condition
5.76	B-2	Basement		Post	Cntr.	Wood	White	Deteriorated	Paint Stabilization

XRF Reading (mg/cm2)	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition	Recommendation
4.58	2-5	Bathroom		Baseboard	A	Wood	Beige	Intact	Maintain in intact condition
2.53	2-5	Bathroom		Baseboard	C	Wood	Beige	Intact	Maintain in intact condition
4.22	2-5	Bathroom		Baseboard	D	Wood	Beige	Intact	Maintain in intact condition
2.64	2-5	Bathroom	Door (Entry)	Casing	A	Wood	Beige	Intact	Maintain in intact condition
2.74	2-5	Bathroom	Door (Entry)	Jamb	A	Wood	Beige	Intact	Maintain in intact condition
7.77	2-5	Bathroom	Door (Wall D Closet)	Casing Outside Closet	D	Wood	Beige	Intact	Maintain in intact condition
4.18	2-5	Bathroom	Window	Casing	D	Wood	Beige	Intact	Maintain in intact condition
3.09	2-5	Bathroom	Window	Sill	D	Wood	Beige	Intact	Maintain in intact condition
4.42	2-5	Bathroom	Window	Stop	D	Wood	Beige	Intact	Maintain in intact condition
2.9	2-5	Bathroom	Closet	Jamb	D	Wood	Beige	Intact	Maintain in intact condition
4.26	2-5	Bathroom	Closet	Stop (on Jamb)	D	Wood	Beige	Intact	Maintain in intact condition
2.28	2-5	Bathroom	Closet	Casing Inside Closet	D	Wood	Beige	Intact	Maintain in intact condition
8.39	2-5	Bathroom	Closet	Shelf Support	D	Wood	Beige	Intact	Maintain in intact condition
7.67	2-5	Bathroom	Closet	Baseboard	D	Wood	Beige	Intact	Maintain in intact condition

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XRF Reading (mg/cm2)	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition	Recommendation
2.99	Exterior	Main Structure	Front Porch	Ceiling	Cntr.	Plaster	Beige	Intact	Maintain enclosure
8.12	Exterior	Main Structure Side A	Window	Casing	A	Metal Over Wood	White	Intact	Maintain enclosure
8.95	Exterior	Main Structure Side A	Window	Sill	A	Vinyl Over Wood	White	Intact	Maintain enclosure
5.76	Exterior	Main Structure Side A	Front Porch	Beam (Perimeter of Roof)	A	Wood	White	Intact	Maintain enclosure
3.58	Exterior	Main StructureSide B		Wall	B	VinylOver Assumed Wood	White	Intact	Maintain enclosure
>10	Exterior	Main Structure Side B	Window	Casing	B	Metal Over Assumed Wood	White	Intact	Maintain enclosure
3.27	Exterior	Main Structure Side B	Window	Sill	B	Vinyl Over Assumed Wood	White	Intact	Maintain enclosure
5.38	Exterior	Main Structure Side C	Window	Casing	C	Metal Over Assumed Wood	White	Intact	Maintain enclosure
1.54	Exterior	Main Structure Side C	Window	Sill	C	Vinyl Over Assumed Wood	White	Intact	Maintain enclosure

XRF Reading (mg/cm2)	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition	Recommendation
2.75	Exterior	Main Structure Side D		Wall	D	Vinyl Over Assumed Wood	White	Intact	Maintain enclosure
9.36	Exterior	Main Structure Side D	Window	Casing	D	Metal Over Assumed Wood	White	Intact	Maintain enclosure
7.31	Exterior	Main Structure Side D	Window	Sill	D	Vinyl Over Assumed Wood	White	Intact	Maintain enclosure
3.6	Exterior	Main Structure Side D	Door (Entry)	Casing	D	Metal Over Assumed Wood	White	Intact	Maintain enclosure

Appendix I

Lead Hazard Control Levels/Methods

Lead Hazard Levels

Lead is hazardous, especially for children who are six years of age or younger. Lead can reduce intelligence, cause behavior and learning problems, slow growth and impair hearing. Children can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

Lead-based paint is any paint or surface coating that contains lead equal to or in excess of 1.0 milligrams per square centimeter (1.0 mg/cm^2) or equal to or in excess of 0.5% by weight. Lead-based paint is hazardous when it is:

1. On a friction surface. The paint on surfaces like window sashes and jambs can break down during normal use and release lead dust. If dust levels on the nearest flat surface exceed acceptable levels, then the friction surface is a hazard.

2. On a chewable surface that has evidence of teeth marks. These are surfaces, such as windowsills, railings, door edges that a young child can mouth or chew.

3. On an impact surface where there is damaged or otherwise deteriorated paint from impact from a related building component (such as a door frame banging together).

4. Deteriorated paint that is peeling, chipping, chalking, or cracking. When lead paint breaks down or is disturbed due to remodeling, dry scraping, or water damage; paint chips and dust can be released and easily ingested by young children through hand-to-mouth activity.

Lead Hazard Control Methods

1. Non-friction or Non-impact Surfaces. Examples include: interior or exterior walls, ceilings, trim, casings, baseboards, etc.

    a. Removal of the lead-based painted component and replacement with a lead-free component.

    b. Paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals, or certain abrasive measures either onsite or offsite.

    c. Enclosure of the lead-based painted component with durable materials. Durable materials include wallboard, drywall/plaster, paneling, siding, coil stock and the sealing or caulking of edges and joints.

    d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

    e. Paint stabilization and a written ongoing maintenance and monitoring schedule.

    f. Any other lead-safe method of permanently removing the lead hazard.

2. Friction or Impact Surfaces. Examples include window systems, doors, floors, etc.

    a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the impact surfaces with durable materials. Durable materials include wallboard, drywall/plaster, paneling, plywood, coil stock, and the sealing or caulking of edges and joints.

d. Elimination of the friction points or application of a treatment that will prevent abrasion of the friction surface and a written ongoing maintenance and monitoring schedule.

e. Any other lead-safe method of permanently removing the lead hazard.

3. Chewable Surfaces. Examples include windowsills, railings and other child-accessible surfaces that show evidence of teeth marks.

a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the lead-based painted component with a material that cannot be penetrated by a child's teeth.

d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

e. Any other lead safe method of permanently removing the lead hazard.

The following practices are **PROHIBITED**:

1. Open flame burning or torching.

2. Machine sanding or grinding without a HEPA local vacuum exhaust tool.

3. Abrasive blasting or sandblasting without a HEPA local vacuum exhaust tool.

4. Use of a heat gun operating above one thousand one hundred degrees Fahrenheit.

5. Charring paint.

6. Dry sanding.

7. Dry scraping, except when done as follows:

a. In conjunction with a heat gun operating at not more than one thousand one hundred degrees Fahrenheit.

b. Within one foot of an electrical outlet.

c. To treat defective paint spots totaling not more than two square feet in an interior room or space or eleven square feet on an exterior surface.

8. Uncontained hydroblasting or high-pressure washing.

9. Paint stripping in a poorly ventilated space using a volatile stripper that is considered a hazardous substance under 16 C.F.R. 1500.3 or a hazardous chemical under 29 C.F.R. 1910.1200 or 29 C.F.R. Pre-1960.59 in the type of work being performed.

Important Notes:

1. Residents, especially children and pregnant women, must be kept away from the lead hazard control area. Proper and thorough cleanup is important so that dust and paint chips are not left behind at the end of the job.

2. After lead hazard control work is done, the home must pass a clearance examination, typically including dust wipe samples.

3. Paint stabilization, interim window treatments, and impermanent covering of lead-contaminated soil require a written ongoing maintenance and monitoring schedule and an annual clearance examination. It is recommended that a visual check of past repairs involving painted surfaces be done annually and at unit turnover.

4. Other surfaces that measured below hazard limits should also be addressed to prevent them from becoming hazardous. It is recommended that lead-safe work practices be used when such surfaces are repaired or replaced.

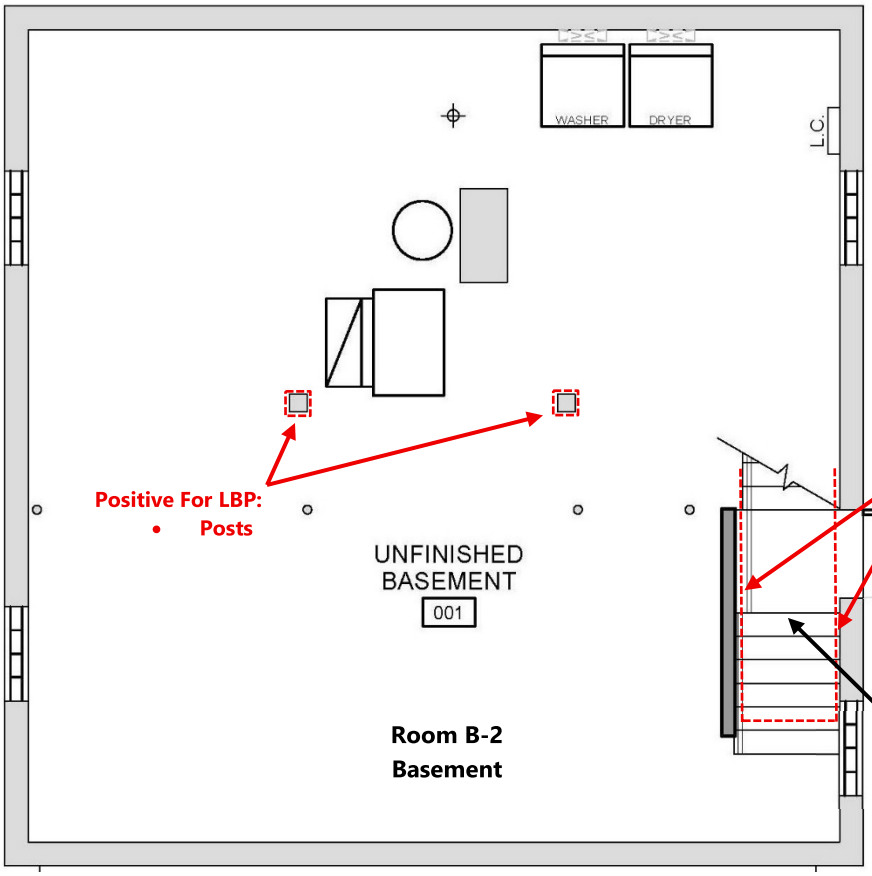
Appendix II

Diagrams

563 East Northern Street
Basement Plan

Side C

Side B



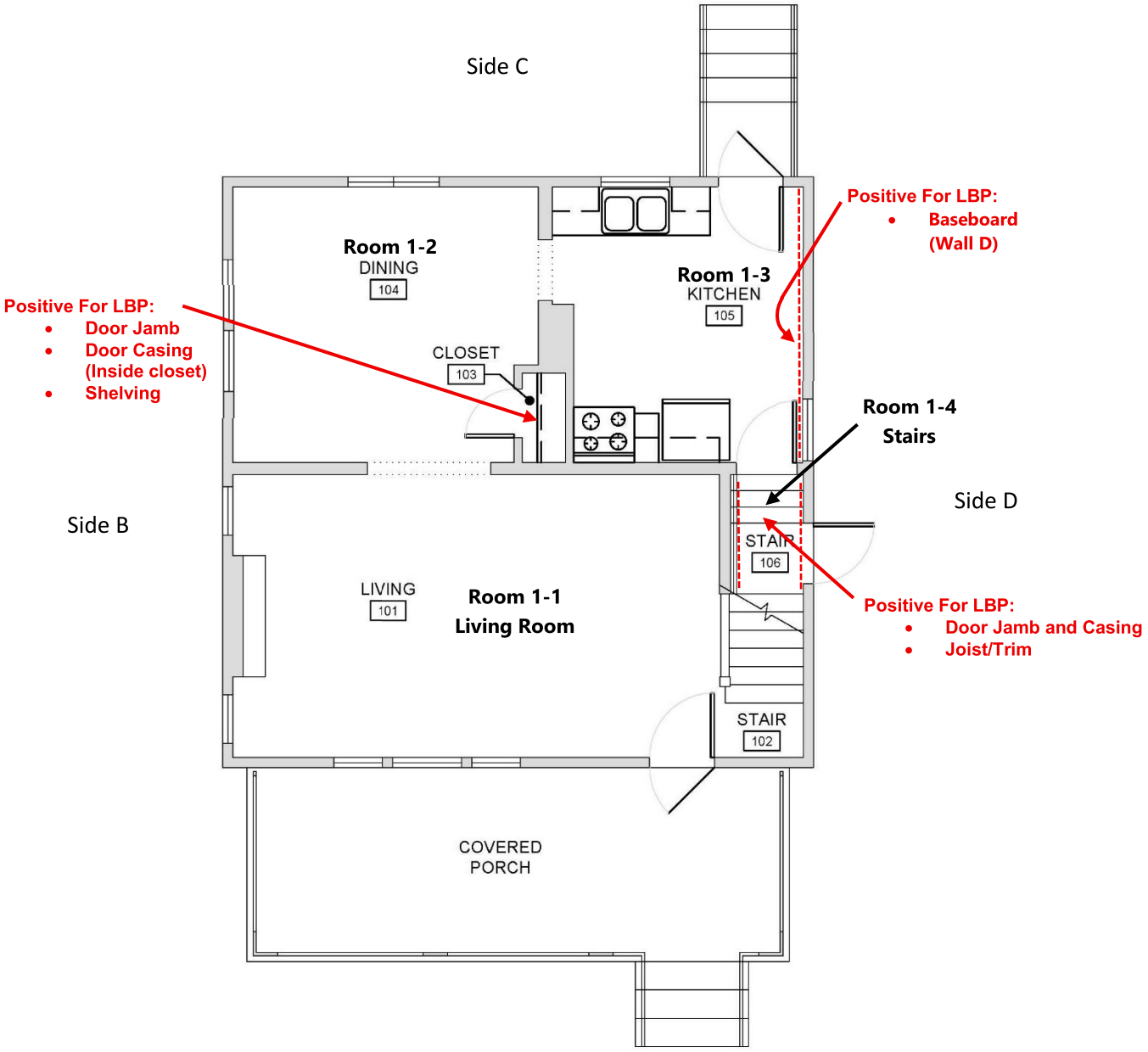
Side D

Side A

N

Property: 563 East Northern Street Springfield, Ohio 45503	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

563 East Northern Street
First Floor Plan



Exterior Components Positive For LBP:
All Sides

- Siding
- Door Casings /Trim
- Window Casing/Trim
- Porch Ceiling Trim, Soffit

Note: Exterior Components Are Covered by Vinyl Siding or Aluminum Coil Stock Assumed to Cover LBP Coated Wood Components

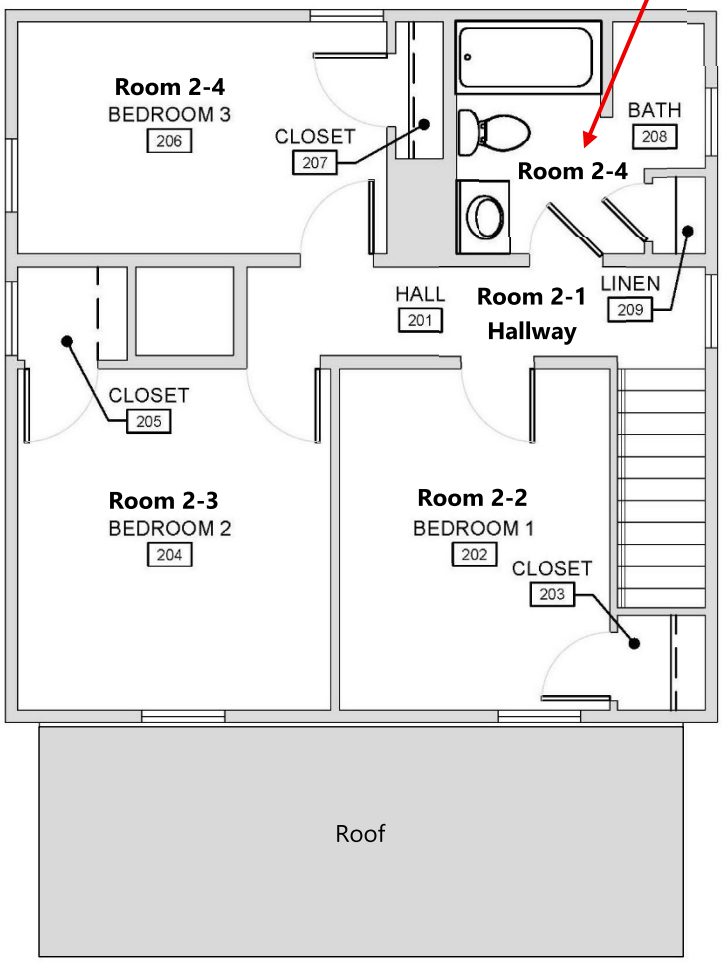
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Property: 563 East Northern Street Springfield, Ohio 45503	**PROJECT** Lead Based Paint Inspection	**DRAWING TITLE** Floor Plan	mac Paran

563 East Northern Street
Second Floor Plan

Positive For LBP:
- Entry Door Jamb and Casing
- Baseboard Throughout
- Window Casing, Sill, Stop
- Closet Door Jamb and Casing
- Closet Baseboard
- Closet Shelf Supports

Side C



Side B

Side D

Side A

Exterior Components Positive For LBP:
All Sides
- Siding
- Door Casings /Trim
- Window Casing/Trim
- Porch Ceiling Trim, Soffit

Note: Exterior Components Are Covered by Vinyl Siding or Aluminum Coil Stock Assumed to Cover LBP Coated Wood Components

N

Property: 563 East Northern Street Springfield, Ohio 45503	**PROJECT** Lead Based Paint Inspection	**DRAWING TITLE** Floor Plan	mac Paran

Appendix III

Lead Risk Assessor Certification

Ohio | Department of Health

Mike DeWine, Governor
Jon Husted, Lt.Governor

Bruce Vanderhoff, MD, MBA, Director

October 09, 2024

Thomas E Wenk
319 Shawnee Trail
Dayton OK 45458

RE: Lead Risk Assessor
License Number: LA000898
Expiration Date: 10/09/2026

Dear Thomas E Wenk:

This letter and enclosed license approves your request to be licensed as a Lead Risk Assessor. You must present your license upon request at any project site while performing duties. A copy of your license is not acceptable as proof of licensure.

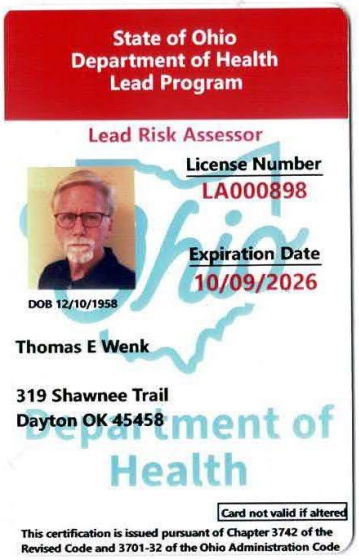
Please be aware of the rules and regulations governing your discipline for Ohio. If you choose to renew this license, you must take an Ohio approved refresher course appropriate for the discipline within your current two year licensure period. Renewal applications must be submitted prior to the expiration of your current license to avoid additional reinstatement fees. Please visit our website at www.odh.ohio.gov for information.

This license may be revoked by the Director of Health for violation of any of the requirements of 3701-32 of the Ohio Administrative Code.

If you have any questions, please call the Ohio Department of Health, Lead Poisoning Prevention Program at (614) 466-1450.

Sincerely,

Shamus Estep
Program Administrator
Bureau of Environmental Health and Radiation Protection



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Cincinnati

3959 Fulton Grove Rd.
Cincinnati, Ohio 45245
(513) 752-9111

Services

Phase I ESA's
Phase II Investigations
Asbestos
Lead-Based Paint
Industrial Hygiene
Indoor Air Quality/Mold
Radon
Safety
Training

Lead-Based Paint Inspection

2122 Morgan Street
Springfield, Ohio 45503

Year of Construction: Pre 1978

Prepared for:

Springfield Metropolitan Housing Authority
2026 West High Street
Springfield, Ohio 45502
(937) 325-7331

Prepared by:

m.a.c. Paran Consulting Services, Inc.

Tom Wenk
Ohio Lead Risk Assessor: LA-000898

Michelle Paraniuk, M.S., President

December 2025

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2.0 Executive Summary 1

3.0 Observations/Limitations to the Inspection 1

4.0 Previous Lead Inspection/Risk Assessment History 2

5.0 Lead Paint Results 2

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Appendix II Diagrams
Appendix III Lead Risk Assessor Certification

1.0 Disclosure Requirements for Residential Units

Ohio law (Section 5302.30 of the Revised Code) requires every person who intends to transfer any residential real property by sale, land installment contract, lease with the option to purchase, exchange, or lease for a term of ninety-nine years and renewable forever, to complete and provide a copy to the prospective transferee of the applicable property disclosure forms, disclosing known hazardous conditions of the property, including lead-based paint hazards.

Federal law (24 CFR part 35 and 40 CFR part 745) requires sellers and lessors of residential units constructed prior to 1978, except housing for the elderly or persons with disabilities (unless any child who is less than six years of age resides or is expected to reside in such housing) or any zero-bedroom dwelling to disclose and provide a copy of this report to new purchasers or lessees before they become obligated under a lease or sales contract. Property owners and sellers are also required to distribute an educational pamphlet approved by the United States Environmental Protection Agency (EPA) and include standard warning language in sales contracts or in or attached to lease contracts to ensure that parents have the information they need to protect children from lead-based paint hazards.

2.0 Executive Summary

On December 8, 2025, a lead-based paint inspection was conducted of the residential structure located at 2122 Morgan Street, Springfield, Ohio 45503. The inspection included:

- ✓ Visual assessment of paint condition
- ✓ Use of a portable X-ray fluorescence (XRF) analyzer to test for lead in paint.

One hundred eighty-two (182) readings (including calibration readings) were collected from the interior and exterior of the structure. Refer to Table 1 for a listing of all readings collected.

3.0 Observations/Limitations to the Inspection

The structure was observed to be in fair condition. The following limitations were encountered during the inspection:

Observation/Limitation	Presumed Positive
Upper structural elements were not tested	Yes
Cove base was located in various areas	No

4.0 Previous Lead Inspection/Risk Assessment History

No prior report was made available for review.

5.0 Lead Paint Results

An X-Ray Fluorescence (XRF) Lead Analyzer was used to test the paint for lead. This analyzer is a non-destructive method for testing paint, providing immediate results for each test conducted.

XRF Manufacturer:	SciAps
XRF Device/Serial Number:	Model X-550 No. 02091
XRF Operator:	Tom Wenk
Operator License Number:	LA-000898
Inspection Date:	December 8, 2025
Inspection Site:	2122 Morgan Street Springfield, Ohio 45503

Paint containing lead equal to or greater than 1.0 mg/cm^2 is considered to be lead-based paint per the Department of Housing and Urban Development (HUD) and EPA definitions. This is of importance should the property be renovated into residential units. Building components in a room that are similar in construction history to those that tested positive for lead are considered positive for lead.

Paint conditions:

- ✓ Intact: Entire surface area is judged to be intact. Intact surfaces may or may not have been tested and need only monitoring.
- ✓ Deteriorated: shows any sign of abrasion and/or is peeling, chipping, chalking, or cracking, or otherwise damaged or separated from the substrate.

The following table represents readings collected during the assessment. **Readings that are highlighted in red represent coatings containing lead equal to or exceeding 1.0 mg/cm^2 (i.e., lead-based coating per HUD/EPA definition).**

Table 1: XRF Results Table

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
1	0.99	Positive	Calibration							
2	0.98	Positive	Calibration							
3	0.93	Positive	Calibration							
4	0.97	Positive	Calibration							
5	0	Negative	1-1	Living Room		Wall	A	Drywall	Beige	Intact
6	0	Negative	1-1	Living Room		Wall	B	Drywall	Beige	Intact
7	0	Negative	1-1	Living Room		Wall	C	Drywall	Beige	Intact
8	0	Negative	1-1	Living Room		Wall	D	Drywall	Beige	Intact
9	0	Negative	1-1	Living Room		Ceiling	NA	Drywall	Beige	Intact
10	0	Negative	1-1	Living Room		Baseboard	A	Wood	Beige	Intact
11	0	Negative	1-1	Living Room	Door (Entry)	Casing	A	Wood	Beige	Intact
12	0	Negative	1-1	Living Room	Door (Entry)	Jamb	A	Wood	Beige	Intact
13	0	Negative	1-1	Living Room	Door (Entry)	Door	A	Metal	Beige	Intact
14	0	Negative	1-1	Living Room	Door (Wall D Closet)	Door	D	Wood	Brown	Intact
15	0	Negative	1-1	Living Room	Closet	Door	D	Wood	Brown	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
16	0	Negative	1-1	Living Room	Closet	Wall	D	Drywall	Beige	Intact
17	0	Negative	1-1	Living Room	Closet	Shelf	D	Wood	Beige	Intact
18	0	Negative	1-1	Living Room	Closet	Shelf Edge	D	Wood	Beige	Intact
19	0	Negative	1-1	Living Room	Closet	Shelf Support	D	Wood	Beige	Intact
20	0	Negative	1-2	Kitchen		Wall	A	Drywall	Beige	Intact
21	0	Negative	1-2	Kitchen		Wall	B	Drywall	Beige	Intact
22	0	Negative	1-2	Kitchen		Wall	C	Drywall	Beige	Intact
23	0	Negative	1-2	Kitchen		Wall	D	Drywall	Beige	Intact
24	0	Negative	1-2	Kitchen		Ceiling	D	Drywall	Beige	Intact
25	0	Negative	1-2	Kitchen		Baseboard	A	Wood	Beige	Intact
26	0	Negative	1-2	Kitchen	Door (Wall D Utility Closet)		D	Wood	Brown	Intact
27	0	Negative	1-2	Kitchen	Door (Closet Under Stairs)		D	Wood	Brown	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
28	0	Negative	1-2	Kitchen	Closet (Wall D Utility)	Door	D	Wood	Brown	Intact
29	0	Negative	1-2	Kitchen	Closet (Wall D Utility)	Jamb	D	Metal	Beige	Intact
30	0.01	Negative	1-2	Kitchen	Closet (Wall D Utility)	Casing	D	Metal	Beige	Intact
31	0	Negative	1-2	Kitchen	Closet (Wall D Utility)	Wall	D	Drywall	Beige	Intact
32	0	Negative	1-2	Kitchen	Door (Under Stairs)	Door	D	Wood	Brown	Intact
33	0	Negative	1-2	Kitchen	Door (Under Stairs)	Jamb	D	Metal	Beige	Intact
34	0	Negative	1-2	Kitchen	Door (Under Stairs)	Wall	D	Drywall	Beige	Intact
35	0	Negative	1-2	Kitchen	Cabinets	Door	C	Wood	Brown	Intact
36	0	Negative	1-2	Kitchen	Cabinets	Shelf	C	Wood	Beige	Intact
37	0	Negative	1-2	Kitchen	Cabinets	Cabinet	C	Wood	Stained	Intact
38	0	Negative	1-2	Kitchen	Window	Frame	C	Metal	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
39	0	Negative	1-3	Bathroom		Wall	A	Drywall	Beige	Intact
40	0	Negative	1-3	Bathroom		Wall	B	Drywall	Beige	Intact
41	0	Negative	1-3	Bathroom		Wall	C	Drywall	Beige	Intact
42	0	Negative	1-3	Bathroom		Wall	D	Drywall	Beige	Intact
43	0	Negative	1-3	Bathroom		Ceiling	D	Drywall	Beige	Intact
44	0	Negative	1-3	Bathroom		Baseboard	A	Wood	Beige	Intact
45	0	Negative	1-3	Bathroom	Door (Back Entry)	Casing	A	Wood	Beige	Intact
46	0.01	Negative	1-3	Bathroom	Door (Back Entry)	Jamb	A	Wood	Beige	Intact
47	0	Negative	1-3	Bathroom	Door (Back Entry)		A	Wood	Brown	Intact
48	0	Negative	1-4	Hallway		Wall	A	Drywall	Beige	Intact
49	0	Negative	1-4	Hallway		Wall	C	Drywall	Beige	Intact
50	0	Negative	1-4	Hallway		Wall	D	Drywall	Beige	Intact
51	0	Negative	1-4	Hallway		Ceiling	D	Drywall	Beige	Intact
52	0	Negative	1-4	Hallway		Baseboard	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
53	0	Negative	1-4	Hallway	Laundry Nook	Shelf	C	Wood	Beige	Intact
54	0	Negative	1-4	Hallway	Laundry Nook	Shelf Support	C	Wood	Beige	Intact
55	0	Negative	1-4	Hallway	Laundry Nook	Wall	C	Drywall	Beige	Intact
56	0	Negative	1-4	Hallway	Window	Window Frame	D	Metal	Beige	Intact
57	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Wall	A	Drywall	Beige	Intact
58	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Wall	C	Drywall	Beige	Intact
59	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Ceiling	NA	Drywall	Beige	Intact
60	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Tread	B	Wood	Stained	Intact
61	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Riser	B	Wood	Stained	Intact
62	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Stringer	A	Wood	Stained	Intact
63	0	Negative	1-5	Stairs To Second Floor	Stairs to Second Floor	Railing	A	Metal	Black	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
64	0	Negative	2-1	Bedroom 1		Wall	A	Drywall	Beige	Intact
65	0	Negative	2-1	Bedroom 1		Wall	B	Drywall	Beige	Intact
66	0.01	Negative	2-1	Bedroom 1		Wall	C	Drywall	Beige	Intact
67	0	Negative	2-1	Bedroom 1		Wall	D	Drywall	Beige	Intact
68	0	Negative	2-1	Bedroom 1		Ceiling	NA	Drywall	Beige	Intact
69	0	Negative	2-1	Bedroom 1		Baseboard	B	Wood	Beige	Intact
70	0.01	Negative	2-1	Bedroom 1		Casing	B	Wood	Beige	Intact
71	0.01	Negative	2-1	Bedroom 1		Jamb	B	Wood	Beige	Intact
72	0	Negative	2-1	Bedroom 1		Door	B	Wood	Brown	Intact
73	0	Negative	2-1	Bedroom 1		Door	B	Wood	Brown	Intact
74	0	Negative	2-1	Bedroom 1	Closet	Door	B	Wood	Brown	Intact
75	0	Negative	2-1	Bedroom 1	Closet	Wall	B	Drywall	Beige	Intact
76	0	Negative	2-1	Bedroom 1	Closet	Shelf	B	Wood	Beige	Intact
77	0	Negative	2-1	Bedroom 1	Closet	Shelf Edge	B	Wood	Beige	Intact
78	0	Negative	2-1	Bedroom 1	Closet	Shelf Support	B	Wood	Beige	Intact
79	0	Negative	2-1	Bedroom 1	Window	Frame	A	Metal	Beige	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
80	0.04	Negative	2-2	Bedroom 2		Wall	A	Drywall	Beige	Intact
81	0.09	Negative	2-2	Bedroom 2		Wall	B	Drywall	Beige	Intact
82	0.03	Negative	2-2	Bedroom 2		Wall	C	Drywall	Beige	Intact
83	0.03	Negative	2-2	Bedroom 2		Wall	D	Drywall	Beige	Intact
84	0.03	Negative	2-2	Bedroom 2		Ceiling	D	Drywall	Beige	Intact
85	0	Negative	2-2	Bedroom 2		Baseboard	B	Wood	Beige	Intact
86	0.01	Negative	2-2	Bedroom 2		Casing	C	Wood	Beige	Intact
87	0.02	Negative	2-2	Bedroom 2		Jamb	C	Wood	Beige	Intact
88	0	Negative	2-2	Bedroom 2	Closet	Door	C	Wood	Brown	Intact
89	0	Negative	2-2	Bedroom 2	Closet	Door	D	Wood	Brown	Intact
90	0.05	Negative	2-2	Bedroom 2	Closet	Wall	D	Drywall	Beige	Intact
91	0.12	Negative	2-2	Bedroom 2	Closet	Shelf	D	Wood	Beige	Intact
92	0.08	Negative	2-2	Bedroom 2	Closet	Shelf Edge	D	Wood	Beige	Intact
93	0.05	Negative	2-2	Bedroom 2	Closet	Shelf Support	D	Wood	Beige	Intact
94	0	Negative	2-2	Bedroom 2	Window	Frame	A	Metal	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
95	0	Negative	2-3	Bedroom 3		Wall	A	Drywall	Beige	Intact
96	0	Negative	2-3	Bedroom 3		Wall	B	Drywall	Beige	Intact
97	0	Negative	2-3	Bedroom 3		Wall	C	Drywall	Beige	Intact
98	0	Negative	2-3	Bedroom 3		Wall	D	Drywall	Beige	Intact
99	0	Negative	2-3	Bedroom 3		Ceiling	NA	Drywall	Beige	Intact
100	0	Negative	2-3	Bedroom 3		Baseboard	A	Wood	Beige	Intact
101	0	Negative	2-3	Bedroom 3	Door (Entry)	Casing	D	Wood	Beige	Intact
102	0.02	Negative	2-3	Bedroom 3	Door (Entry)	Jamb	D	Wood	Beige	Intact
103	0	Negative	2-3	Bedroom 3	Door (Entry)		D	Wood	Brown	Intact
104	0	Negative	2-3	Bedroom 3	Door (Wall C Closet)		C	Wood	Brown	Intact
105	0	Negative	2-3	Bedroom 3	Closet	Door	C	Wood	Brown	Intact
106	0	Negative	2-3	Bedroom 3	Closet	Wall	C	Drywall	Beige	Intact
107	0	Negative	2-3	Bedroom 3	Closet	Shelf	C	Wood	Beige	Intact
108	0	Negative	2-3	Bedroom 3	Closet	Shelf Edge	C	Wood	Beige	Intact
109	0	Negative	2-3	Bedroom 3	Closet	Shelf Support	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
110	0	Negative	2-3	Bedroom 3	Window	Frame	A	Metal	Beige	Intact
111	0	Negative	2-4	Bedroom 4		Wall	A	Drywall	Beige	Intact
112	0	Negative	2-4	Bedroom 4		Wall	B	Drywall	Beige	Intact
113	0	Negative	2-4	Bedroom 4		Wall	C	Drywall	Beige	Intact
114	0.01	Negative	2-4	Bedroom 4		Wall	D	Drywall	Beige	Intact
115	0	Negative	2-4	Bedroom 4		Ceiling	NA	Drywall	Beige	Intact
116	0	Negative	2-4	Bedroom 4		Baseboard	C	Wood	Beige	Intact
117	0.01	Negative	2-4	Bedroom 4	Door (Entry)	Casing	D	Wood	Beige	Intact
118	0.01	Negative	2-4	Bedroom 4	Door (Entry)	Jamb	D	Wood	Beige	Intact
119	0	Negative	2-4	Bedroom 4	Door (Entry)		D	Wood	Brown	Intact
120	0	Negative	2-4	Bedroom 4	Door (Wall A Closet)		A	Wood	Brown	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
121	0	Negative	2-4	Bedroom 4	Closet	Door	A	Wood	Brown	Intact
122	0	Negative	2-4	Bedroom 4	Closet	Wall	D	Drywall	Beige	Intact
123	0	Negative	2-4	Bedroom 4	Closet	Shelf	A	Wood	Beige	Intact
124	0	Negative	2-4	Bedroom 4	Closet	Shelf Edge	A	Wood	Beige	Intact
125	0	Negative	2-4	Bedroom 4	Closet	Shelf Support	D	Wood	Beige	Intact
126	0	Negative	2-4	Bedroom 4	Window	Frame	C	Metal	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
127	0	Negative	2-5	Bathroom		Wall	A	Drywall	Beige	Intact
128	0	Negative	2-5	Bathroom		Wall	B	Drywall	Beige	Intact
129	0	Negative	2-5	Bathroom		Wall	C	Drywall	Beige	Intact
130	0	Negative	2-5	Bathroom		Wall	D	Drywall	Beige	Intact
131	0	Negative	2-5	Bathroom		Ceiling	A	Drywall	Beige	Intact
132	0.01	Negative	2-5	Bathroom	Door (Entry)	Casing	A	Wood	Beige	Intact
133	0.01	Negative	2-5	Bathroom	Door (Entry)	Jamb	A	Wood	Beige	Intact
134	0	Negative	2-5	Bathroom	Door (Entry)	Door	A	Wood	Brown	Intact
135	0	Negative	2-5	Bathroom	Door (Wall B Closet)	Door	B	Wood	Brown	Intact
136	0	Negative	2-5	Bathroom	Vanity	Door	D	Wood	Brown	Intact
137	0	Negative	2-5	Bathroom	Vanity	Cabinet	D	Wood	Stained	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
138	0	Negative	2-5	Bathroom	Closet	Door	B	Wood	Brown	Intact
139	0	Negative	2-5	Bathroom	Closet	Wall	B	Drywall	Beige	Intact
140	0	Negative	2-5	Bathroom	Closet	Shelf	B	Wood	Beige	Intact
141	0	Negative	2-5	Bathroom	Closet	Shelf Edge	B	Wood	Beige	Intact
142	0.02	Negative	2-5	Bathroom	Closet	Shelf Support	B	Wood	Beige	Intact
143	0.03	Negative	2-6	Bedroom 5		Wall	A	Drywall	Beige	Intact
144	0.02	Negative	2-6	Bedroom 5		Wall	B	Drywall	Beige	Intact
145	0.05	Negative	2-6	Bedroom 5		Wall	C	Drywall	Beige	Intact
146	0.03	Negative	2-6	Bedroom 5		Wall	D	Drywall	Beige	Intact
147	0	Negative	2-6	Bedroom 5		Ceiling	NA	Drywall	Beige	Intact
148	0.01	Negative	2-6	Bedroom 5		Baseboard	C	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
149	0.01	Negative	2-6	Bedroom 5	Door (Entry)	Casing	B	Wood	Beige	Intact
150	0	Negative	2-6	Bedroom 5	Door (Entry)	Jamb	B	Wood	Beige	Intact
151	0	Negative	2-6	Bedroom 5	Door (Entry)	Door	B	Wood	Brown	Intact
152	0.01	Negative	2-6	Bedroom 5	Door (Wall A Closet)	Door	B	Wood	Brown	Intact
153	0.01	Negative	2-6	Bedroom 5	Closet	Door	A	Wood	Brown	Intact
154	0.01	Negative	2-6	Bedroom 5	Closet	Jamb	A	Wood	Beige	Intact
155	0.01	Negative	2-6	Bedroom 5	Closet	Casing	A	Wood	Beige	Intact
156	0.01	Negative	2-6	Bedroom 5	Closet	Wall	D	Drywall	Beige	Intact
157	0.02	Negative	2-6	Bedroom 5	Closet	Shelf	A	Wood	Beige	Intact
158	0.02	Negative	2-6	Bedroom 5	Closet	Shelf Edge	A	Wood	Beige	Intact
159	0.02	Negative	2-6	Bedroom 5	Closet	Shelf Support	D	Wood	Beige	Intact
160	0	Negative	2-6	Bedroom 5	Closet	Large Shelf	C	Wood	Beige	Intact
161	0.01	Negative	2-6	Bedroom 5	Closet	Large Shelf Support	C	Wood	Beige	Intact
162	0.01	Negative	2-6	Bedroom 5	Window	Frame	C	Metal	Beige	Intact

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XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
163	0	Negative	2-7	Hallway		Wall	A	Drywall	Beige	Intact
164	0	Negative	2-7	Hallway		Wall	B	Drywall	Beige	Intact
165	0	Negative	2-7	Hallway		Wall	C	Drywall	Beige	Intact
166	0	Negative	2-7	Hallway		Wall	D	Drywall	Beige	Intact
167	0	Negative	2-7	Hallway		Ceiling	NA	Drywall	Beige	Intact
168	0	Negative	2-7	Hallway		Baseboard	A	Wood	Beige	Intact
169	0	Negative	2-7	Hallway	Door (Wall B Closet)	Door	B	Wood	Brown	Intact
170	0	Negative	2-7	Hallway	Closet	Door	B	Wood	Brown	Intact
171	0	Negative	2-7	Hallway	Closet	Wall	B	Drywall	Beige	Intact
172	0	Negative	2-7	Hallway	Closet	Shelf	B	Wood	Beige	Intact
173	0	Negative	2-7	Hallway	Closet	Shelf Support	B	Wood	Beige	Intact

XRF Reading No.	XRF Reading (mg/cm2)	Result	Unit/Area	Room	Structure	Member	Wall	Substrate	Color	Condition
174	0	Negative	Exterior	Main Structure	Door		A	Metal	Beige	Intact
175	0	Negative	Exterior	Main Structure	Door	Jamb	A	Wood	Beige	Intact
176	0	Negative	Exterior	Main Structure	Door	Casing	A	Wood	Beige	Intact
177	0	Negative	Exterior	Main Structure	Door		C	Metal	Beige	Intact
178	0	Negative	Exterior	Main Structure	Door	Casing	C	Wood	Beige	Intact
179	1	Positive	Calibration							
180	1.01	Positive	Calibration							
181	1.02	Positive	Calibration							
182	1.01	Positive	Calibration							

Appendix I

Lead Hazard Control Levels/Methods

Lead Hazard Levels

Lead is hazardous, especially for children who are six years of age or younger. Lead can reduce intelligence, cause behavior and learning problems, slow growth and impair hearing. Children can get lead in their bodies by breathing or swallowing lead dust, or by eating soil or paint chips with lead in them.

Lead-based paint is any paint or surface coating that contains lead equal to or in excess of 1.0 milligrams per square centimeter (1.0 mg/cm^2) or equal to or in excess of 0.5% by weight. Lead-based paint is hazardous when it is:

1. On a friction surface. The paint on surfaces like window sashes and jambs can break down during normal use and release lead dust. If dust levels on the nearest flat surface exceed acceptable levels, then the friction surface is a hazard.

2. On a chewable surface that has evidence of teeth marks. These are surfaces, such as windowsills, railings, door edges that a young child can mouth or chew.

3. On an impact surface where there is damaged or otherwise deteriorated paint from impact from a related building component (such as a door frame banging together).

4. Deteriorated paint that is peeling, chipping, chalking, or cracking. When lead paint breaks down or is disturbed due to remodeling, dry scraping, or water damage; paint chips and dust can be released and easily ingested by young children through hand-to-mouth activity.

Lead Hazard Control Methods

1. Non-friction or Non-impact Surfaces. Examples include: interior or exterior walls, ceilings, trim, casings, baseboards, etc.

    a. Removal of the lead-based painted component and replacement with a lead-free component.

    b. Paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals, or certain abrasive measures either onsite or offsite.

    c. Enclosure of the lead-based painted component with durable materials. Durable materials include wallboard, drywall/plaster, paneling, siding, coil stock and the sealing or caulking of edges and joints.

    d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

    e. Paint stabilization and a written ongoing maintenance and monitoring schedule.

    f. Any other lead-safe method of permanently removing the lead hazard.

2. Friction or Impact Surfaces. Examples include window systems, doors, floors, etc.

    a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the impact surfaces with durable materials. Durable materials include wallboard, drywall/plaster, paneling, plywood, coil stock, and the sealing or caulking of edges and joints.

d. Elimination of the friction points or application of a treatment that will prevent abrasion of the friction surface and a written ongoing maintenance and monitoring schedule.

e. Any other lead-safe method of permanently removing the lead hazard.

3. Chewable Surfaces. Examples include windowsills, railings and other child-accessible surfaces that show evidence of teeth marks.

a. Removal of the lead-based painted component and replacement with lead-free components.

b. Lead-based paint removal by separation of the lead-based paint from the substrate using heat guns (operated below eleven hundred degrees Fahrenheit), chemicals or certain abrasive measures either onsite or offsite.

c. Enclosure of the lead-based painted component with a material that cannot be penetrated by a child's teeth.

d. Encapsulation of the lead-based painted component by coating and sealing of the component with a durable surface coating.

e. Any other lead safe method of permanently removing the lead hazard.

The following practices are **PROHIBITED**:

1. Open flame burning or torching.

2. Machine sanding or grinding without a HEPA local vacuum exhaust tool.

3. Abrasive blasting or sandblasting without a HEPA local vacuum exhaust tool.

4. Use of a heat gun operating above one thousand one hundred degrees Fahrenheit.

5. Charring paint.

6. Dry sanding.

7. Dry scraping, except when done as follows:

a. In conjunction with a heat gun operating at not more than one thousand one hundred degrees Fahrenheit.

b. Within one foot of an electrical outlet.

c. To treat defective paint spots totaling not more than two square feet in an interior room or space or eleven square feet on an exterior surface.

8. Uncontained hydroblasting or high-pressure washing.

9. Paint stripping in a poorly ventilated space using a volatile stripper that is considered a hazardous substance under 16 C.F.R. 1500.3 or a hazardous chemical under 29 C.F.R. 1910.1200 or 29 C.F.R. Pre-1960.59 in the type of work being performed.

Important Notes:

1. Residents, especially children and pregnant women, must be kept away from the lead hazard control area. Proper and thorough cleanup is important so that dust and paint chips are not left behind at the end of the job.

2. After lead hazard control work is done, the home must pass a clearance examination, typically including dust wipe samples.

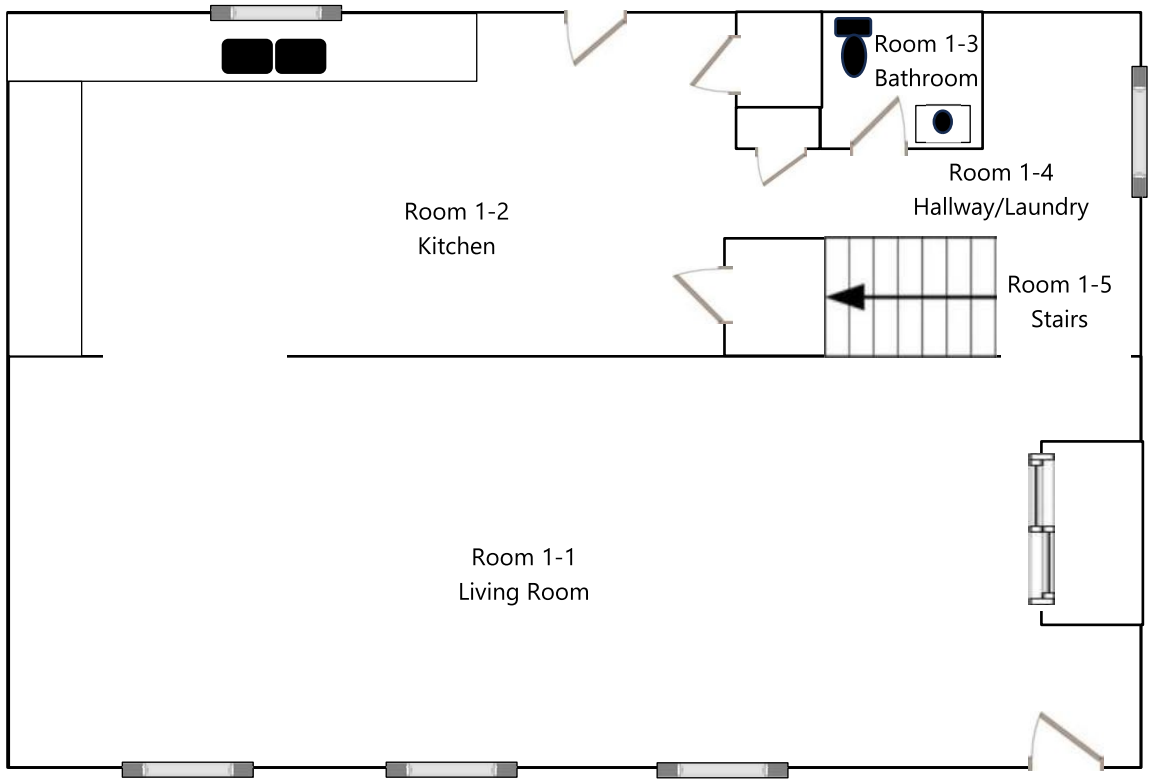
3. Paint stabilization, interim window treatments, and impermanent covering of lead-contaminated soil require a written ongoing maintenance and monitoring schedule and an annual clearance examination. It is recommended that a visual check of past repairs involving painted surfaces be done annually and at unit turnover.

4. Other surfaces that measured below hazard limits should also be addressed to prevent them from becoming hazardous. It is recommended that lead-safe work practices be used when such surfaces are repaired or replaced.

Appendix II

Diagrams

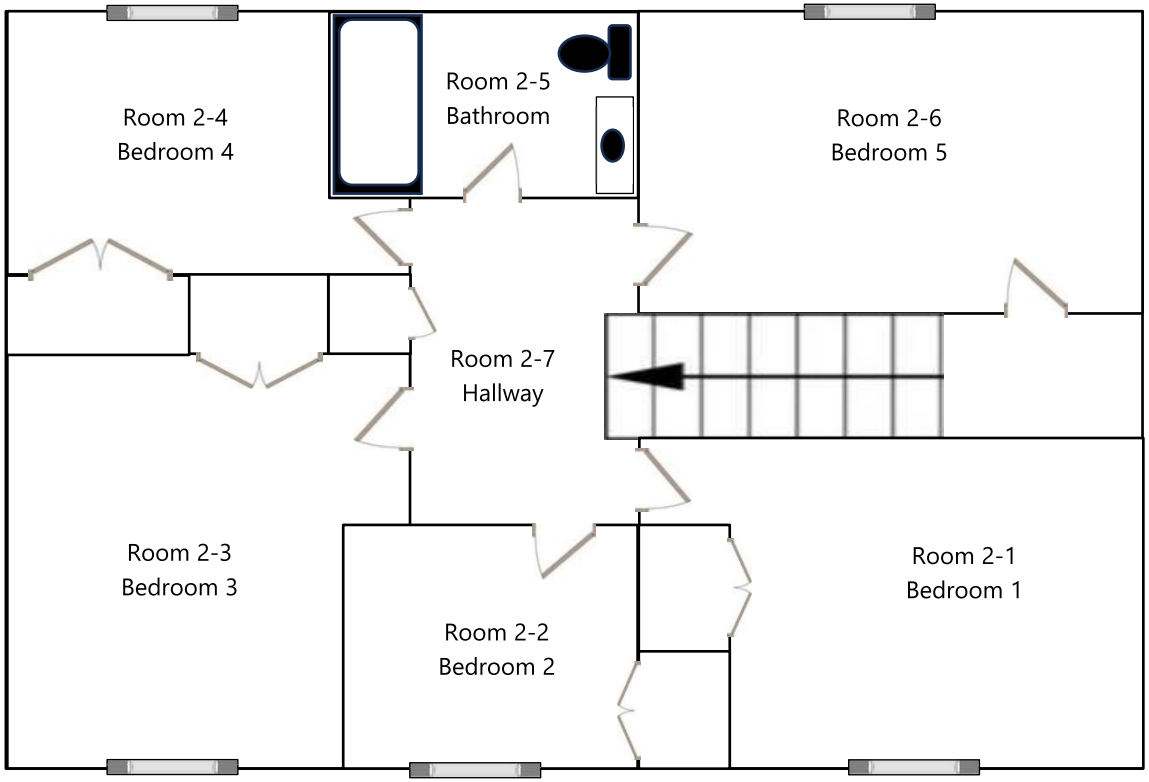
2122 Morgan Street
First Floor



N

Property: 2122 Morgan Street Springfield, Ohio 45503	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

2122 Morgan Street
Second Floor



N

Property: 2122 Morgan Street Springfield, Ohio 45503	**PROJECT** **Lead Based Paint Inspection**	**DRAWING TITLE** **Floor Plan**	mac Paran

Appendix III

Lead Risk Assessor Certification

Ohio | Department of Health

Mike DeWine, Governor
Jon Husted, Lt.Governor

Bruce Vanderhoff, MD, MBA, Director

October 09, 2024

Thomas E Wenk
319 Shawnee Trail
Dayton OK 45458

RE: Lead Risk Assessor
License Number: LA000898
Expiration Date: 10/09/2026

Dear Thomas E Wenk:

This letter and enclosed license approves your request to be licensed as a Lead Risk Assessor. You must present your license upon request at any project site while performing duties. A copy of your license is not acceptable as proof of licensure.

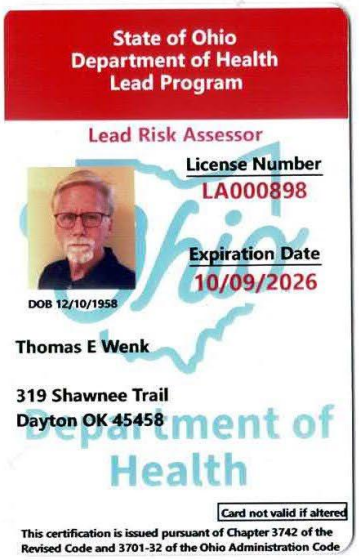
Please be aware of the rules and regulations governing your discipline for Ohio. If you choose to renew this license, you must take an Ohio approved refresher course appropriate for the discipline within your current two year licensure period. Renewal applications must be submitted prior to the expiration of your current license to avoid additional reinstatement fees. Please visit our website at www.odh.ohio.gov for information.

This license may be revoked by the Director of Health for violation of any of the requirements of 3701-32 of the Ohio Administrative Code.

If you have any questions, please call the Ohio Department of Health, Lead Poisoning Prevention Program at (614) 466-1450.

Sincerely,

Shamus Estep
Program Administrator
Bureau of Environmental Health and Radiation Protection



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PINNACLE ENVIRONMENTAL CONSULTANTS, INC.
486 OLD STATE RT. 74 ■ CINCINNATI ■ OHIO ■ 45244 ■ PHONE: 513-533-1823 ■ FAX: 513-533-1859

January 12, 2026

Mr. Doug Drigel
Senior Project Manager
RDA Group Architects
7662 Paragon Road
Dayton, Ohio 45459
(937)610-3440

Re: Pre-Renovation NESHAP Asbestos Inspection Report for the SMHA Modernization Project located in Springfield, Ohio
Pinnacle PN: 25-0165

Dear Mr. Drigel;

On November 4, 2025, Mr. George Beaudion and Mr. Luke Winter of Pinnacle Environmental Consultants, Inc. (see Attachment 1 for certifications) visited the buildings included in the SMHA Modernization Project, specifically units and/or structures located at 1002 and 1006 Robinson Drive, 563 East Northern Avenue, and 2122 Morgan Street in Springfield, Ohio 45503 and 45506 per your request. The purpose of these visits was to collect bulk samples of materials suspect for containing asbestos prior to the planned renovation of the buildings, as required for compliance with the National Emission Standards for Hazardous Air Pollutants (NESHAP). Specifically, seventy-four (74) bulk samples were collected from thirty-three (33) homogeneous areas throughout the structures. Analysis results show four (4) homogeneous areas were identified with asbestos content greater than one percent (>1%). Please reference the *PLM Bulk Sample Data Summary Table* in Attachment 2 for complete sample location, description and analysis information.

Asbestos Bulk Sampling Methods

For friable Surfacing Materials, three (3) bulk samples were collected for each homogeneous area less than or equal to 1,000 square feet. If the homogeneous area was greater than 1,000 square feet but less than 5,000 square feet, five (5) bulk samples were collected. For homogeneous areas that were greater than 5,000 square feet, seven (7) bulk samples were collected. Random sample locations for each homogeneous area of suspect friable surfacing materials were determined by Pinnacle's inspector in the field. Miscellaneous Material and non-friable suspected ACBM were sampled "in a manner sufficient to determine" whether the material in question contained asbestos.

To avoid disturbing the material more than necessary and potentially cause the release of asbestos fibers, Pinnacle performed bulk sampling of suspect materials in accordance with generally accepted procedures outlined in the Asbestos Hazard Emergency Response Act (AHERA). Each sample was collected and placed in a clean, sealable container and labeled with a unique sample identification number. This sample number was recorded on a Bulk Sample Log Sheet, the sample vial, and at the sample location to permit easy identification of the sampled materials in the future. Supplemental information was also recorded on the Bulk Sample Log Sheet, including date of inspection, name of Pinnacle's inspector, the building name (or number), a brief description and location of the sample, and type of material sampled (e.g. drywall, insulation, floor tile, etc.).

Analysis of Bulk Samples

The bulk samples were submitted to Pinnacle Consultants, LLC's Analytical Laboratory (see Attachment 3 for a copy of laboratory NVLAP accreditation) and analyzed for asbestos content by Polarized Light Microscopy (PLM) and dispersion staining (Method Reference: EPA-600/R-93/116) sample analysis. This analytical method is used for qualitative identification of six morphologically different types of asbestos fibers: chrysotile, amosite, crocidolite, anthophyllite, tremolite and actinolite asbestos. The method specifies that the asbestos content in a bulk sample will be estimated and reported as a finite percentage (rounded to the nearest percentage) within the range of 0 to 100.

The results of the bulk sample analysis are reported in a standard written laboratory report. This report includes Pinnacle's project number, the laboratory identification number and the field number assigned to the bulk sample upon collection at the site. If a bulk sample contains more than one distinct layer of material, each layer is analyzed separately. The composition of the bulk sample is reported in percentages of asbestos (i.e., chrysotile, amosite or other) and non-asbestos (i.e., cellulose, fiberglass or other) components.

If a bulk sample of friable material has less than ten percent (<10%) asbestos content, the EPA recommends the sample be analyzed by the point count method reference PLM, EPA 600/R-93/116. This analytical method is a more accurate way of determining the actual asbestos percentage. For this project, no (0) samples were analyzed using point count methods. A copy of the original laboratory reports and sample chain-of-custodies for PLM analysis can be found in Attachment 4.

Results and Conclusions

The locations and quantities of materials known or assumed to contain >1% asbestos can be found on the *Inventory of Asbestos-Containing Material Table* in Attachment 5 with this letter.

Pinnacle did not conduct a destructive survey (i.e. opening of walls and/or ceilings) to identify concealed materials known or suspected to contain asbestos. During renovation activities, if additional suspect asbestos-containing material is discovered, work should stop and suspect material should be sampled. Any additional inspection and/or bulk sampling should be conducted by an EPA certified Asbestos Hazard Evaluation Specialist. Analysis of all bulk samples collected should be performed by laboratories accredited by NVLAP or the American Industrial Hygiene Association.

Current asbestos laws and regulations require removal of ACMs prior to renovation work with the potential to disturb these materials. If removal of ACM is necessary, an EPA licensed asbestos abatement contractor should be contracted to perform the necessary removal work.

Should renovation plans include removal and replacement of fluorescent lighting or CFL bulbs, the lamps/bulbs should be properly removed without breakage and recycled. For ballasts, if the label does not state “No PCBs” the ballast should be removed and properly recycled/incinerated.

Pinnacle greatly appreciates the opportunity to offer our services and expertise to RDA Group Architects for this most important project. Should you have any questions or require additional information, please feel free to contact me at your earliest convenience.

Sincerely,
Pinnacle Environmental Consultants, Inc.
Michael D. Strine

Michael D. Strine, AHES #ES3036
Vice President

Attachments (6)

Attachment 1

PINNACLE'S PERSONNEL CERTIFICATIONS

Ohio Environmental Protection Agency

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

1/27/2025

Lucas Winter
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

RE: Evaluation Specialist
Certification Number: ES551110
Expiration Date: 1/27/2026

Dear Lucas Winter:

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

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

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

Sincerely,

Brandon M. Schwendeman

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



8/5/2025

George Beaudion
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

RE: Evaluation Specialist
Certification Number: ES31662
Expiration Date: 9/7/2026

Dear George Beaudion:

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

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

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

Sincerely,

Brandon M. Schwendeman

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



6/3/2025

Michael Strine
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

RE: Evaluation Specialist
Certification Number: ES3036
Expiration Date: 7/29/2026

Dear Michael Strine:

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

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

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

Sincerely,

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



Attachment 2

BULK SAMPLE DATA SUMMARY TABLE

PLM BULK SAMPLE DATA SUMMARY TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Sample Location	*Sample Description*	*Sample ID No.*	*Lab ID No.*	*Asbestos Content*	** Homo-geneous Area #*	*Friable/ Nonfriable*
The following samples were collected from the building located at 1000-1008 Robinson Drive (Unit 1002):						
Room 1 under kitchen sink	Black sink undercoat	25LW-885	25B-24322	None detected	5	Nonfriable
Room 1 under kitchen sink	Black sink undercoat	25LW-886	25B-24323	None detected	5	Nonfriable
Room 1 wall	Drywall	25LW-905	25B-24332	None detected	3	Nonfriable
Room 1 wall	Joint compound	25LW-906	25B-24333	None detected	4	Nonfriable
Room 1 wall	Drywall and joint compound (composite)	25LW-907	25B-24334	None detected	3, 4	Nonfriable
Room 1 floor	12" Light tan floor tile with gray specs and yellow mastic	25LW-908	25B-24335a 25B-24335b	None detected (tile) None detected (mastic)	1	Nonfriable
Room 4 window	White window caulk	25LW-888	25B-24325	None detected	6	Nonfriable
The following samples were collected from the building located at 1000-1008 Robinson Drive (Unit 1006):						
Room 5 floor	12" Light tan floor tile with gray specs and yellow mastic	25LW-880	25B-24317a 25B-24317b	None detected (tile) None detected (mastic)	1	Nonfriable
Room 8 wall	Drywall	25LW-882	25B-24319	None detected	3	Nonfriable
Room 8 wall	Joint compound	25LW-883	25B-24320	None detected	4	Nonfriable
Room 8 wall	Drywall and joint compound (composite)	25LW-884	25B-24321	None detected	3, 4	Nonfriable
Room 1 window	White window caulk	25LW-887	25B-24324	None detected	6	Nonfriable
Room 1 floor	12" White floor tile with tan smears and black mastic	25LW-889	25B-24326a 25B-24326b	None detected (tile) 2% Chrysotile (mastic)	7	Nonfriable
Room 1 wall	Black covebase	25LW-901	25B-24328	None detected	8	Nonfriable
Room 3 floor	12" White floor tile with tan smears and black mastic	25LW-900	25B-24327	Stopped analysis	7	Nonfriable
Room 6 wall	Black covebase	25LW-902	25B-24329	None detected	8	Nonfriable
Room 6 floor	12" White floor tile with tan smears and yellow mastic	25LW-903	25B-24330a 25B-24330b	None detected (tile) None detected (mastic)	9	Nonfriable

PLM BULK SAMPLE DATA SUMMARY TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Sample Location	*Sample Description*	*Sample ID No.*	*Lab ID No.*	*Asbestos Content*	** Homo-geneous Area #*	*Friable/ Nonfriable*
1006 Robinson Drive continued:						
Room 6 floor	12" White floor tile with tan smears and yellow mastic	25LW-904	25B-24331a 25B-24331b	None detected (tile) None detected (mastic)	9	Nonfriable
The following samples were collected from the Basement of 563 East Northern Avenue:						
Lower wall	Textured finish with swirl pattern	563-25	25B-24212	None detected	8	Nonfriable
Lower wall	Textured finish with swirl pattern	563-26	25B-24213	None detected	8	Nonfriable
Lower wall	Textured finish with swirl pattern	563-27	25B-24214	None detected	8	Nonfriable
The following samples were collected from the First Floor of 563 East Northern Avenue:						
Dining room closet wall	Plaster topcoat	563-4	25B-24191	None detected	1	Nonfriable
Dining room closet wall	Plaster basecoat	563-9	25B-24196	None detected	1A	Nonfriable
Living room wall	Plaster topcoat	563-5	25B-24192	None detected	1	Nonfriable
Living room wall	Plaster basecoat	563-10	25B-24197	None detected	1A	Nonfriable
Living room	Interior caulk	563-30	25B-24217	None detected	10	Nonfriable
Living room	Interior caulk	563-31	25B-24218	None detected	10	Nonfriable
Kitchen	12" Tan floor tile with brown streaks	563-19	25B-24206 25B-24206b	None detected (tile) None detected (mastic)	4	Nonfriable
Kitchen	12" Tan floor tile with brown streaks	563-20	25B-24207 25B-24207b	None detected (tile) None detected (mastic)	4	Nonfriable
Kitchen	2' x 4' Ceiling tile with small pin holes and medium fissures	563-21	25B-24208	None detected	6	Friable
Kitchen	2' x 4' Ceiling tile with small pin holes and medium fissures	563-22	25B-24209	None detected	6	Friable
Kitchen	White sink undercoating	563-23	25B-24210	None detected	7	Nonfriable
Kitchen	White sink undercoating	563-24	25B-24211	None detected	7	Nonfriable
The following samples were collected from the Second Floor of 563 East Northern Avenue:						
Bedroom 1 closet wall	Plaster topcoat	563-1	25B-24188	None detected	1	Nonfriable
Bedroom 1 closet wall	Plaster basecoat	563-6	25B-24193	None detected	1A	Nonfriable
Bedroom 1 floor register boot	Paper HVAC insulation	563-17	25B-24204	50% Chrysotile	5	Friable

PLM BULK SAMPLE DATA SUMMARY TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Sample Location	*Sample Description*	*Sample ID No.*	*Lab ID No.*	*Asbestos Content*	** Homo-geneous Area #*	*Friable/ Nonfriable*
Second Floor of 563 East Northern Avenue continued:						
Bedroom 1 floor register boot	Paper HVAC insulation	563-18	25B-24205	Stopped analysis	5	Friable
Bedroom 2 wall	Plaster topcoat	563-2	25B-24189	None detected	1	Nonfriable
Bedroom 2 wall	Plaster basecoat	563-7	25B-24194	None detected	1A	Nonfriable
Bedroom 3 closet wall	Plaster topcoat	563-3	25B-24190	None detected	1	Nonfriable
Bedroom 3 closet wall	Plaster basecoat	563-8	25B-24195	None detected	1A	Nonfriable
Bathroom	Drywall	563-14	25B-24201	None detected	2	Nonfriable
Bathroom	Joint compound	563-15	25B-24202	None detected	3	Nonfriable
Bathroom	Drywall and joint compound (composite)	563-16	25B-24203	None detected	2, 3	Nonfriable
Stairwell to second floor	Brown tread adhesive	563-28	25B-24215	None detected	9	Nonfriable
Stairwell to second floor	Brown tread adhesive	563-29	25B-24216	None detected	9	Nonfriable
The following samples were collected from the Attic of 563 East Northern Avenue:						
Attic	Drywall	563-11	25B-24198	None detected	2	Nonfriable
Attic	Joint compound	563-12	25B-24199	None detected	3	Nonfriable
Attic	Drywall and joint compound (composite)	563-13	25B-24200	None detected	2, 3	Nonfriable
The following samples were collected from the Exterior of 563 East Northern Avenue:						
Back of house	Exterior caulk	563-32	25B-24219	None detected	11	Nonfriable
Front of house	Exterior caulk	563-33	25B-24220	None detected	11	Nonfriable
The following samples were collected from the First Floor of 2122 Morgan Street:						
Living room	Drywall	2122-15	25B-24235	None detected	1	Nonfriable
Living room	Joint compound	2122-16	25B-24236	None detected	2	Nonfriable
Living room	Drywall and joint compound (composite)	2122-17	25B-24237	None detected	1, 2	Nonfriable
Living room	Interior caulk	2122-20	25B-24240	None detected	8	Nonfriable
Living room	Interior caulk	2122-21	25B-24241	None detected	8	Nonfriable
Kitchen under 12" floor tile	12" Tan floor tile with black mastic	2122-18	25B-24238a 25B-24238b	None detected (tile) 2% Chrysotile (mastic)	7	Nonfriable

PLM BULK SAMPLE DATA SUMMARY TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Sample Location	*Sample Description*	*Sample ID No.*	*Lab ID No.*	*Asbestos Content*	** Homo-geneous Area #*	*Friable/ Nonfriable*
First Floor of 2122 Morgan Street continued:						
Kitchen under 12" floor tile	12" Tan floor tile with black mastic	2122-19	25B-24239a 25B-24239b	None detected (tile) 2% Chrysotile (mastic)	7	Nonfriable
The following samples were collected from the Second Floor of 2122 Morgan Street:						
Bedroom 1	Drywall	2122-1	25B-24221	None detected	1	Nonfriable
Bedroom 1	Joint compound	2122-2	25B-24222	None detected	2	Nonfriable
Bedroom 1	Drywall and joint compound (composite)	2122-3	25B-24223	None detected	1, 2	Nonfriable
Bedroom 3	Drywall	2122-4	25B-24224	None detected	1	Nonfriable
Bedroom 3	Joint compound	2122-5	25B-24225	None detected	2	Nonfriable
Bedroom 3	Drywall and joint compound (composite)	2122-6	25B-24226	None detected	1, 2	Nonfriable
Bedroom 3	12" Tan floor tile with gray and rust streaks	2122-7	25B-24227a 25B-24227b	None detected (tile) None detected (mastic)	3	Nonfriable
Bedroom 3	12" Tan floor tile with gray and rust streaks	2122-8	25B-24228a 25B-24228b	None detected (tile) None detected (mastic)	3	Nonfriable
Bedroom 3 under 12" floor tile	9" Brown floor tile	2122-9	25B-24229a 25B-24229b	5% Chrysotile (tile) 2% Chrysotile (mastic)	4	Nonfriable
Bedroom 3 under 12" floor tile	9" Brown floor tile	2122-10	25B-24230	Stopped analysis	4	Nonfriable
Bathroom	12" White floor tile with yellow mastic	2122-11	25B-24231a 25B-24231b	None detected (tile) None detected (mastic)	5	Nonfriable
Bathroom	12" White floor tile with yellow mastic	2122-12	25B-24232a 25B-24232b	None detected (tile) None detected (mastic)	5	Nonfriable
Stairwell to second floor	Black tread adhesive	2122-13	25B-24233	None detected	6	Nonfriable
Stairwell to second floor	Black tread adhesive	2122-14	25B-24234	None detected	6	Nonfriable

PLM BULK SAMPLE DATA SUMMARY TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Sample Location	*Sample Description*	*Sample ID No.*	*Lab ID No.*	*Asbestos Content*	** Homo-geneous Area #*	*Friable/ Nonfriable*
The following samples were collected from the Exterior of 2122 Morgan Street:						
Front of house	Exterior caulk	2122-22	25B-24242	None detected	9	Nonfriable
Front of house	Exterior caulk	2122-23	25B-24243	None detected	9	Nonfriable

**** Homogeneous area number descriptions (bold type indicates asbestos-containing material)***

1000-1008 Robinson Drive (Units #1002 & 1006):
1 - 12" Light tan floor tile with gray specs and yellow mastic
3 - Drywall
4 - Joint compound
5 - Black sink undercoat
6 - White window caulk
7 - 12" White floor tile with tan smears and **black mastic**
8 - Black covebase
9 - 12" White floor tile with tan smears and yellow mastic

563 East Northern Avenue:
1 - Plaster topcoat
1A - Plaster basecoat
2 - Drywall
3 - Joint compound
4 - 12" Tan floor tile with brown streaks
5 - Paper HVAC insulation
6 - 2' x 4' Ceiling tile with small pin holes and medium fissures
7 - White sink undercoating
8 - Textured finish with swirl pattern
9 - Brown tread adhesive
10 - Interior caulk
11 - Exterior caulk

2122 Morgan Street:
1 - Drywall
2 - Joint compound
3 - 12" Tan floor tile with gray and rust streaks
4 - 9" Brown floor tile and mastic
5 - 12" White floor tile with yellow mastic
6 - Black tread adhesive
7 - 12" Tan floor tile with **black mastic**
8 - Interior caulk
9 - Exterior caulk

Attachment 3

ANALYTICAL LABORATORY NVLAP ACCREDITATION CERTIFICATE

United States Department of Commerce
National Institute of Standards and Technology

Certificate of Accreditation to ISO/IEC 17025:2017

NVLAP LAB CODE: 200718-0

Pinnacle Consultants, LLC

Nitro, WV

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

Asbestos Fiber Analysis

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

2025-07-01 through 2026-06-30

Effective Dates

For the National Voluntary Laboratory Accreditation Program

National Voluntary Laboratory Accreditation Program

SCOPE OF ACCREDITATION TO ISO/IEC 17025:2017

Pinnacle Consultants, LLC
10 Independent Avenue
Nitro, WV 25143
Ms. Miranda Reedy
Phone: 304-757-5204 Fax: 304-757-5205
Email: miranda.reedy@pinnaclecorp.net
http://www.pinnaclecorp.net

ASBESTOS FIBER ANALYSIS **NVLAP LAB CODE 200718-0**

Bulk Asbestos Analysis

Code	*Description*
18/A01	EPA -- 40 CFR Appendix E to Subpart E of Part 763, Interim Method of the Determination of Asbestos in Bulk Insulation Samples
18/A03	EPA 600/R-93/116: Method for the Determination of Asbestos in Bulk Building Materials

For the National Voluntary Laboratory Accreditation Program

Attachment 4

LABORATORY REPORTS AND SAMPLE CHAIN-OF-CUSTODIES

PINNACLE CONSULTANTS

10 INDEPENDENT AVENUE
NITRO, WV 25143
PHONE 304.757.5204
FAX 304.440.3465
www.pinnaclecorp.net

ASBESTOS IDENTIFICATION BY POLARIZED LIGHT MICROSCOPY ANALYSIS

Attn: **Chris Belcher**
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

Client Project/PO#: 25-0165
PC Project #:
Received Date: 11/6/2025
Analysis Date: 11/11/2025

Project Location: 1098 Robinson Dr, Springfield, OH 45506 Apt 1002 & 1006

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-880	25B-24317a		Brown

Texture/Description: Solid/Vinyl Like
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-880	25B-24317b		Yellow

Texture/Description: Solid/Mastic Like
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 3% Filler/Binder: 97 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-881	25B-24318	NOT SUBMITTED	

Texture/Description: /
TOTAL ASBESTOS:
Chrysotile: Tremolite: Anthophyllite:
Amosite: Actinolite: Crocidolite:
Cellulose: Fiber Glass: Others: Filler/Binder:

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-882	25B-24319		White/Brown

Texture/Description: Solid/
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 40 % Fiber Glass: 0% Others: 0% Filler/Binder: 60 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-883	25B-24320		Cream

Texture/Description: Solid/
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 20 % Fiber Glass: 0% Others: 0% Filler/Binder: 80 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-884	25B-24321		White/Brown

Texture/Description: Solid/
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 45 % Fiber Glass: 0% Others: 0% Filler/Binder: 55 %

Project Location: 1098 Robinson Dr, Springfield, OH 45506 Apt 1002 & 1006

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-885	25B-24322		Black

Texture/Description: Solid/ Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-886	25B-24323		Black

Texture/Description: Solid/ Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-887	25B-24324		White

Texture/Description: Solid/ Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-888	25B-24325		White

Texture/Description: Solid/ Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-889	25B-24326a		Beige

Texture/Description: Solid/Vinyl Like Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-889	25B-24326b		Black/Yellow

Texture/Description: Solid/Mastic Like Chrysotile: 2 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 2 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-900	25B-24327	STOPPED ANALYSIS	

Texture/Description: / Chrysotile: Tremolite: Anthophyllite:
TOTAL ASBESTOS: Amosite: Actinolite: Crocidolite:
Cellulose: Fiber Glass: Others: Filler/Binder:

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-901	25B-24328		Dark Grey

Texture/Description: Solid/ Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 % Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

Project Location: 1098 Robinson Dr, Springfield, OH 45506 Apt 1002 & 1006

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-902	25B-24329		Dark Grey

Texture/Description: Solid/

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-903	25B-24330a		White

Texture/Description: Solid/Vinyl Like

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-903	25B-24330b		Yellow

Texture/Description: Solid/Mastic Like

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 2% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-904	25B-24331a		White

Texture/Description: Solid/Vinyl Like

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-904	25B-24331b		Yellow

Texture/Description: Solid/Mastic Like

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 4% Filler/Binder: 96 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-905	25B-24332		White/Brown

Texture/Description: Solid/

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 20 % Fiber Glass: 0% Others: 0% Filler/Binder: 80 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-906	25B-24333		Cream

Texture/Description: Solid/

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 5 % Fiber Glass: 0% Others: 0% Filler/Binder: 95 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-907	25B-24334		White/Brown

Texture/Description: Solid/

TOTAL ASBESTOS: 0 %

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 18 % Fiber Glass: 0% Others: 0% Filler/Binder: 82 %

Project Location: 1098 Robinson Dr, Springfield, OH 45506 Apt 1002 & 1006

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-908	25B-24335a		Brown

Texture/Description: Solid/Vinyl Like

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%

TOTAL ASBESTOS: 0 %

Amosite: 0% Actinolite: 0% Crocidolite: 0%

Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-908	25B-24335b		Yellow

Texture/Description: Solid/Mastic Like

Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%

TOTAL ASBESTOS: 0 %

Amosite: 0% Actinolite: 0% Crocidolite: 0%

Cellulose: 0 % Fiber Glass: 0% Others: 2% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
25LW-909	25B-24336	NOT SUBMITTED	

Texture/Description: /

Chrysotile: Tremolite: Anthophyllite:

TOTAL ASBESTOS:

Amosite: Actinolite: Crocidolite:

Cellulose: Fiber Glass: Others: Filler/Binder:

Analytical Method: Polarized light microscopy using dispersion staining (App. E to Sub. E of 40 CFR Part 763 and EPA/600/R-93/116). PLM should not be used to demonstrate the absence of asbestos in floor tiles. All samples will be held for thirty (30) days unless otherwise requested. This report relates only to items tested and makes no statement as to the contents of surrounding materials and apply to the sample as received. Multi-layered material which have distinct and separable layers shall be reported separately. This report shall not be reproduced, except in full, without written permission. The results of this report should not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Analyzed by: Casey Brown

Pinnacle Consultants

10 Independent Avenue
Nitro, West Virginia 25143
Tel: 304-757-5204
Fax: 304-757-5205
Web: www.pinnaclecorp.net

Company Name:	Pinnacle Environmental Consultants, Inc.
Contact Name:	Chris Belcher
Address:	486 Old State Route 74
City State Zip:	Cincinnati, OH 45244
Phone:	513.533.1823
Email:	cbelcher@pinnacleinc.biz

TURNAROUND TIME REQUESTED

Same Day ☐ 3-Day ☐
1-Day ☐ 4-Day ☐
2-Day ☑ 5-Day ☐
Special Request:

TYPE OF ANALYSIS REQUESTED

ASBESTOS
PCM (Air Samples) ☐ PLM (Bulk Samples) ☑
TEM Analysis ☐ Point Count (If Applicable) ☐
Analyze to Positive ☐

FUNGAL SPORE
Spore Trap (Air) ☐
Direct Exam (Tape/Swab/Wipe) ☐

LEAD
XRF ☐ Soil ☐
Wipe ☐ Chips ☐

Bill To If Different:	
Address:	
City State Zip:	
Alt. Email:	

Comments/Instructions:
Give Results to Mike Strine
mstrine@pinnacleinc.biz

PAID BY: Cash ☐ Card ☐ Check ☐

Project ID: 25-0165
PO Number:
Sampling Date/Time: 11/4/25
Sampled By: Luke Winter

Project Description/Location:
1098 Robinson Dr. Springfield, OH 45506 Apt 1002 & 1006

Sample ID	Description	Comments	Lab ID
25LW	-880, -908 (HA-1)		25B-24317
-	-881, -909 (HA-2)		
	-882, -905 (HA-3)		
	-883, -906 (HA-4)		
	-884, -907 (HA-3), (HA-4) - DW & JC		
	-885, -886 (HA-5)		
	-887, -888 (HA-6)		
	-889, -900 (HA-7)		
	-901, -902 (HA-8)		
	-903, -904 (HA-9)		25B-24336

Laboratory Use:
RECEIVED
NOV 06 2025
3 PS

Relinquished By: Luke Winter Date: 11/5/25

Received By: Date:
Time:

PINNACLE CONSULTANTS

10 INDEPENDENT AVENUE
NITRO, WV 25143
PHONE 304.757.5204
FAX 304.440.3465
www.pinnaclecorp.net

ASBESTOS IDENTIFICATION BY POLARIZED LIGHT MICROSCOPY ANALYSIS

Attn: Chris Belcher
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

Client Project/PO#: 25-0165
PC Project #:
Received Date: 11/5/2025
Analysis Date: 11/6/2025

Project Location: 563 East Northern Ave - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-1	25B-24188		White

Texture/Description: Solid/Plaster Skim Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-2	25B-24189		White

Texture/Description: Solid/Plaster Skim Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-3	25B-24190		White

Texture/Description: Solid/Plaster Skim Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-4	25B-24191		White

Texture/Description: Solid/Plaster Skim Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-5	25B-24192		White

Texture/Description: Solid/Plaster Skim Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-6	25B-24193		Brown

Texture/Description: Solid/Plaster Base Coat
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Amosite: 0% Tremolite: 0% Actinolite: 0% Anthophyllite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 8% Filler/Binder: 92 %

Project Location: **563 East Northern Ave - Springfield, Ohio**

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-7	25B-24194		Brown

Texture/Description: Solid/Plaster Base Coat
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 12% Filler/Binder: 88 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-8	25B-24195		Brown

Texture/Description: Solid/Plaster Base Coat
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 10% Filler/Binder: 90 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-9	25B-24196		Brown

Texture/Description: Solid/Plaster Base Coat
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 5% Filler/Binder: 95 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-10	25B-24197		Brown

Texture/Description: Solid/Plaster Base Coat
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 15% Filler/Binder: 85 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-11	25B-24198		White/Brown

Texture/Description: Solid/Drywall
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 15 % Fiber Glass: 0% Others: 0% Filler/Binder: 85 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-12	25B-24199		White

Texture/Description: Solid/Compound
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-13	25B-24200		White/Brown

Texture/Description: Solid/Composite
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 16 % Fiber Glass: 0% Others: 0% Filler/Binder: 84 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-14	25B-24201		White/Brown

Texture/Description: Solid/Drywall
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 10 % Fiber Glass: 0% Others: 0% Filler/Binder: 90 %

Project Location: 563 East Northern Ave - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-15	25B-24202		White

Texture/Description: Solid/Compound
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-16	25B-24203		White/Brown

Texture/Description: Solid/Composite
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 12 % Fiber Glass: 0% Others: 0% Filler/Binder: 88 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-17	25B-24204	HVAC	Grey

Texture/Description: Solid/Paper Insulation
Chrysotile: 50% Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 50 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 50 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-18	25B-24205	STOPPED ANALYSIS	

Texture/Description: /
Chrysotile: Tremolite: Anthophyllite:
TOTAL ASBESTOS:
Amosite: Actinolite: Crocidolite:
Cellulose: Fiber Glass: Others: Filler/Binder:

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-19	25B-24206		Tan

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-19	25B-24206b		Brown/Yellow

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 3% Filler/Binder: 97 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-20	25B-24207		Tan

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-20	25B-24207b		Brown/Yellow

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 6% Filler/Binder: 94 %

Project Location: **563 East Northern Ave - Springfield, Ohio**

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-21	25B-24208		White

Texture/Description: Solid/2x4 Ceiling Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 55 % Fiber Glass: 0% Others: 0% Filler/Binder: 45 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-22	25B-24209		White

Texture/Description: Solid/2x4 Ceiling Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 65 % Fiber Glass: 0% Others: 0% Filler/Binder: 35 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-23	25B-24210	Sink	White

Texture/Description: Solid/Undercoating
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 2% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-24	25B-24211	Sink	White

Texture/Description: Solid/Undercoating
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 2% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-25	25B-24212	Wall	White

Texture/Description: Solid/Textured Finish
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-26	25B-24213	Wall	White

Texture/Description: Solid/Textured Finish
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-27	25B-24214	Wall	White

Texture/Description: Solid/Textured Finish
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-28	25B-24215	Stairwell Tread	Brown

Texture/Description: Solid/Adhesive
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 3% Filler/Binder: 97 %

Project Location: 563 East Northern Ave - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-29	25B-24216	Stairwell Tread	Brown

Texture/Description: Solid/Adhesive

TOTAL ASBESTOS: 0 %

Chrysotile: 0 %	Tremolite: 0%	Anthophyllite: 0%	
Amosite: 0%	Actinolite: 0%	Crocidolite: 0%	
Cellulose: 0 %	Fiber Glass: 0%	Others: 4%	Filler/Binder: 96 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-30	25B-24217	Interior	White

Texture/Description: Solid/Caulking

TOTAL ASBESTOS: 0 %

Chrysotile: 0 %	Tremolite: 0%	Anthophyllite: 0%	
Amosite: 0%	Actinolite: 0%	Crocidolite: 0%	
Cellulose: 0 %	Fiber Glass: 0%	Others: 0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-31	25B-24218	Interior	White

Texture/Description: Solid/Caulking

TOTAL ASBESTOS: 0 %

Chrysotile: 0 %	Tremolite: 0%	Anthophyllite: 0%	
Amosite: 0%	Actinolite: 0%	Crocidolite: 0%	
Cellulose: 0 %	Fiber Glass: 0%	Others: 0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-32	25B-24219	Exterior	White

Texture/Description: Solid/Caulking

TOTAL ASBESTOS: 0 %

Chrysotile: 0 %	Tremolite: 0%	Anthophyllite: 0%	
Amosite: 0%	Actinolite: 0%	Crocidolite: 0%	
Cellulose: 0 %	Fiber Glass: 0%	Others: 0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
563-33	25B-24220	Exterior	White

Texture/Description: Solid/Caulking

TOTAL ASBESTOS: 0 %

Chrysotile: 0 %	Tremolite: 0%	Anthophyllite: 0%	
Amosite: 0%	Actinolite: 0%	Crocidolite: 0%	
Cellulose: 0 %	Fiber Glass: 0%	Others: 0%	Filler/Binder: 100%

Analytical Method: Polarized light microscopy using dispersion staining (App. E to Sub. E of 40 CFR Part 763 and EPA/600/R-93/116). PLM should not be used to demonstrate the absence of asbestos in floor tiles. All samples will be held for thirty (30) days unless otherwise requested. This report relates only to items tested and makes no statement as to the contents of surrounding materials and apply to the sample as received. Multi-layered material which have distinct and separable layers shall be reported separately. This report shall not be reproduced, except in full, without written permission. The results of this report should not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Analyzed by: Casey Brown

Pinnacle Consultants

10 Independent Avenu
Nitro, West Virginia 2514
Tel: 304-757-520
Fax: 304-757-520
Web: www.pinnaclecorp.ne

Company Name:	Pinnacle Environmental Consultants, Inc.
Contact Name:	George Beaudion
Address:	486 Old State Route 74
City State Zip:	Cincinnati, OH 45244
Phone:	513.533.1823
Email:	gbeaudion@pinnacleinc.biz

TURNAROUND TIME REQUESTED

Same Day ☐ 3-Day ☐
1-Day ☑ 4-Day ☐
2-Day ☐ 5-Day ☐
Special Request:

TYPE OF ANALYSIS REQUESTED

ASBESTOS
PCM (Air Samples) ☐ PLM (Bulk Samples) ☑
TEM Analysis ☐ Point Count (If Applicable) ☐
Analyze to Positive ☐

FUNGAL SPORE
Spore Trap (Air) ☐
Direct Exam (Tape/Swab/Wipe) ☐

LEAD
XRF ☐ Soil ☐
Wipe ☐ Chips ☐

Bill To If Different:
Address:
City State Zip:
Alt. Email:

Comments/Instructions: Positive stop on: 9→10, 11→12

PAID BY: Cash ☐ Card ☐ Check ☐

Project ID: ~~23-7024~~ 25-0165
PO Number:
Sampling Date/Time:
Sampled By: George Beaudion
Project Description/Location: 2122 Morgan St. - Springfield, Ohio

Sample ID	Description	Comments	Lab ID
2122-1	Drywall		25B-24221
2	Compound		
3	Composite		
4	Drywall		
5	Compound		
6	Composite		
7	12" Floor Tile		
8	↓		
9	9" Floor Tile		
10	↓		
11	12" Floor Tile		
12	↓		
13	Step tread Adhesive		
14	↓		
15	Drywall		
16	Compound		
17	Composite		
18	12" Floor Tile		
19	↓		
20	Interior Caulking		25B-24240

Laboratory Use:

Relinquished By: George S. Beaudion Date: 11/4/25

Received By: Casey Date: NOV 05 2025

IPS

Pinnacle Consultants

10 Independent Avenu
Nitro, West Virginia 2514
Tel: 304-757-520
Fax: 304-757-520
Web: www.pinnaclecorp.ne

Company Name:	Pinnacle Environmental Consultants, Inc.
Contact Name:	George Beaudion
Address:	486 Old State Route 74
City State Zip:	Cincinnati, OH 45244
Phone:	513.533.1823
Email:	gbeaudion@pinnacleinc.biz

TURNAROUND TIME REQUESTED

Same Day ☐ 3-Day ☐
1-Day ☑ 4-Day ☐
2-Day ☐ 5-Day ☐
Special Request:

TYPE OF ANALYSIS REQUESTED

ASBESTOS
PCM (Air Samples) ☐ PLM (Bulk Samples) ☑
TEM Analysis ☐ Point Count (If Applicable) ☐
Analyze to Positive ☐

FUNGAL SPORE
Spore Trap (Air) ☐
Direct Exam (Tape/Swab/Wipe) ☐

LEAD
XRF ☐ Soil ☐
Wipe ☐ Chips ☐

Bill To If Different:
Address:
City State Zip:
Alt. Email:

Comments/Instructions:

PAID BY: Cash ☐ Card ☐ Check ☐

Project ID: ~~23-7024~~ 25-0165
PO Number:
Sampling Date/Time:
Sampled By: George Beaudion
Project Description/Location: 2122 Morgan St. - Springfield, Ohio

Sample ID	Description	Comments	Lab ID
2122-21	Interior Caulking		25B-2421
22	Exterior Caulking		2422
23	↓		2423

Laboratory Use:

Relinquished By: George S. Beaudion Date: 11/4/25

Received By: Date:

NOV 05 2025

PINNACLE CONSULTANTS

10 INDEPENDENT AVENUE
NITRO, WV 25143
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ASBESTOS IDENTIFICATION BY POLARIZED LIGHT MICROSCOPY ANALYSIS

Attn: **Chris Belcher**
Pinnacle Environmental Consultants, Inc.
486 Old State Route 74
Cincinnati, OH 45244

Client Project/PO#: 25-0165
PC Project #:
Received Date: 11/5/2025
Analysis Date: 11/6/2025

Project Location: 2122 Morgan St. - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-1	25B-24221		White/Brown

Texture/Description: Solid/Drywall
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 25 % Fiber Glass: 0% Others: 0% Filler/Binder: 75 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-2	25B-24222		White

Texture/Description: Solid/Compound
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-3	25B-24223		White/Brown

Texture/Description: Solid/Composite
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 33 % Fiber Glass: 0% Others: 0% Filler/Binder: 67 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-4	25B-24224		White/Brown

Texture/Description: Solid/Drywall
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 20 % Fiber Glass: 0% Others: 0% Filler/Binder: 80 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-5	25B-24225		White

Texture/Description: Solid/Compound
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-6	25B-24226		White/Brown

Texture/Description: Solid/Composite
TOTAL ASBESTOS: 0 %
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 30 % Fiber Glass: 0% Others: 0% Filler/Binder: 70 %

Project Location: 2122 Morgan St. - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-7	25B-24227a		Cream

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-7	25B-24227b		Brown

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 3% Filler/Binder: 97 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-8	25B-24228a		Cream

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-8	25B-24228b		Brown

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 2% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-9	25B-24229a		Brown

Texture/Description: Solid/9" Floor Tile
Chrysotile: 5 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 5 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 95 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-9	25B-24229b		Black

Texture/Description: Solid/Mastic
Chrysotile: 2 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 2 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-10	25B-24230	STOPPED ANALYSIS	

Texture/Description: /
Chrysotile: Tremolite: Anthophyllite:
TOTAL ASBESTOS:
Amosite: Actinolite: Crocidolite:
Cellulose: Fiber Glass: Others: Filler/Binder:

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-11	25B-24231a		White

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

Project Location: 2122 Morgan St. - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-11	25B-24231b		Yellow

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 2 % Fiber Glass: 0% Others: 0% Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-12	25B-24232a		White

Texture/Description: Solid/12" Floor Tile
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-12	25B-24232b		Yellow

Texture/Description: Solid/Mastic
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 4 % Fiber Glass: 0% Others: 0% Filler/Binder: 96 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-13	25B-24233	Stair Tread	Brown

Texture/Description: Solid/Adhesive
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 5% Filler/Binder: 95 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-14	25B-24234	Stair Tread	Brown

Texture/Description: Solid/Adhesive
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 8% Filler/Binder: 92 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-15	25B-24235		White/Brown

Texture/Description: Solid/Drywall
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 15 % Fiber Glass: 0% Others: 0% Filler/Binder: 85 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-16	25B-24236		White

Texture/Description: Solid/Compound
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 0 % Fiber Glass: 0% Others: 0% Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-17	25B-24237		White/Brown

Texture/Description: Solid/Composite
Chrysotile: 0 % Tremolite: 0% Anthophyllite: 0%
TOTAL ASBESTOS: 0 %
Amosite: 0% Actinolite: 0% Crocidolite: 0%
Cellulose: 18 % Fiber Glass: 0% Others: 0% Filler/Binder: 82 %

Project Location: 2122 Morgan St. - Springfield, Ohio

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-18	25B-24238a		White

Texture/Description: Solid/12" Floor Tile
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-18	25B-24238b		Black

Texture/Description: Solid/Mastic
TOTAL ASBESTOS: 2 %

Chrysotile:	2 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-19	25B-24239a		White

Texture/Description: Solid/12" Floor Tile
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-19	25B-24239b		Black

Texture/Description: Solid/Mastic
TOTAL ASBESTOS: 2 %

Chrysotile:	2 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 98 %

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-20	25B-24240	Interior	White

Texture/Description: Solid/Caulking
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-21	25B-24241	Interior	White

Texture/Description: Solid/Caulking
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-22	25B-24242	Exterior	Grey/Brown

Texture/Description: Solid/Caulking
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

CLIENT ID #:	LAB ID #:	LOCATION:	COLOR:
2122-23	25B-24243	Exterior	Grey/Brown

Texture/Description: Solid/Caulking
TOTAL ASBESTOS: 0 %

Chrysotile:	0 %	Tremolite:	0%	Anthophyllite: 0%
Amosite:	0%	Actinolite:	0%	Crocidolite: 0%
Cellulose: 0 %	Fiber Glass: 0%	Others:	0%	Filler/Binder: 100%

Project Location: **2122 Morgan St. - Springfield, Ohio**

Analytical Method: Polarized light microscopy using dispersion staining (App. E to Sub. E of 40 CFR Part 763 and EPA/600/R-93/116). PLM should not be used to demonstrate the absence of asbestos in floor tiles. All samples will be held for thirty (30) days unless otherwise requested. This report relates only to items tested and makes no statement as to the contents of surrounding materials and apply to the sample as received. Multi-layered material which have distinct and separable layers shall be reported separately. This report shall not be reproduced, except in full, without written permission. The results of this report should not be used by the client to claim product certification, approval, or endorsement by NVLAP, NIST, or any agency of the U.S. Government.

Analyzed by: Casey Brown

Pinnacle Consultants

10 Independent Avenu
Nitro, West Virginia 2514
Tel: 304-757-520
Fax: 304-757-520
Web: www.pinnaclecorp.ne

Company Name:	Pinnacle Environmental Consultants, Inc.
Contact Name:	George Beaudion
Address:	486 Old State Route 74
City State Zip:	Cincinnati, OH 45244
Phone:	513.533.1823
Email:	gbeaudion@pinnacleinc.biz

TURNAROUND TIME REQUESTED

Same Day ☐ 3-Day ☐
1-Day ☑ 4-Day ☐
2-Day ☐ 5-Day ☐
Special Request:

TYPE OF ANALYSIS REQUESTED

ASBESTOS
PCM (Air Samples) ☐ PLM (Bulk Samples) ☑
TEM Analysis ☐ Point Count (If Applicable) ☐
Analyze to Positive ☐

FUNGAL SPORE
Spore Trap (Air) ☐
Direct Exam (Tape/Swab/Wipe) ☐

LEAD
XRF ☐ Soil ☐
Wipe ☐ Chips ☐

Bill To If Different:
Address:
City State Zip:
Alt. Email:

Comments/Instructions: Positive Stop on:
17→18, 19→20, 21→22, 23→24,
28→29, 30→31, 32→33

PAID BY: Cash ☐ Card ☐ Check ☐

Project ID: ~~23-7024~~ 25-0165
PO Number:
Sampling Date/Time:
Sampled By: George Beaudion
Project Description/Location: 563 East Northern Ave - Springfield, Ohio

Sample ID	Description	Comments	Lab ID
563-1	Plaster - Skim Coat		25B-24188
2	↓		
3			
4			
5			
6	Plaster - Base Coat		
7	↓		
8			
9			
10			
11	Drywall		
12	Compound		
13	Composite		
14	Drywall		
15	Compound		
16	Composite		
17	Paper HVAC Insulation		
18	↓		
19	12" Floor Tile		
20	↓		25B-24207

Laboratory Use:

Relinquished By: George S. Beaudion Date: 11/4/25

Received By: [signature] Date: NOV 05 2025
Time:

Pinnacle Consultants

10 Independent Avenue
Nitro, West Virginia 2514:
Tel: 304-757-520
Fax: 304-757-520
Web: www.pinnaclecorp.ne

Company Name:	Pinnacle Environmental Consultants, Inc.
Contact Name:	George Beaudion
Address:	486 Old State Route 74
City State Zip:	Cincinnati, OH 45244
Phone:	513.533.1823
Email:	gbeaudion@pinnacleinc.biz

TURNAROUND TIME REQUESTED

Same Day ☐ 3-Day ☐
1-Day ☑ 4-Day ☐
2-Day ☐ 5-Day ☐
Special Request:

TYPE OF ANALYSIS REQUESTED

ASBESTOS
PCM (Air Samples) ☐ PLM (Bulk Samples) ☑
TEM Analysis ☐ Point Count (If Applicable) ☐
Analyze to Positive ☐

FUNGAL SPORE
Spore Trap (Air) ☐
Direct Exam (Tape/Swab/Wipe) ☐

LEAD
XRF ☐ Soil ☐
Wipe ☐ Chips ☐

Bill To If Different:
Address:
City State Zip:
Alt. Email:

Comments/Instructions:

PAID BY: Cash ☐ Card ☐ Check ☐

Project ID: ~~23-7024~~ 25-0165
PO Number:
Sampling Date/Time:
Sampled By: George Beaudion
Project Description/Location: 563 East Northern Ave - Springfield, Ohio

Sample ID	Description	Comments	Lab ID
563-21	2X4 Ceiling Tile		258-24208
22	↓		
23	Sink Undercoating		
24	↓		
25	Textured Wall Finish		
26			
27	↓		
28	Stairwell Tread Adhesive		
29	↓		
30	Interior Caulking		
31	↓		
32	Exterior Caulking		
33	↓		258-24220

Laboratory Use:

Relinquished By: George S. Beaudion Date: 11/4/25

Received By: [signature] Date: NOV 05 2025
Time:

Attachment 5

INVENTORY OF ASBESTOS-CONTAINING MATERIAL TABLE

INVENTORY OF ASBESTOS-CONTAINING MATERIAL TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Material Location	Material Description	* Homo-geneous Area #	Type ACM	Estimated Quantity*	Category-Friable/ Nonfriable
The following homogeneous areas are located on the First Floor of 1002 Robinson Drive:					
Room 1 - Kitchen (under floor tile)	Black mastic	7	Misc.	210 sf	I-Nonfriable
Room 2 - Closet (under floor tile)	Black mastic	7	Misc.	25 sf	I-Nonfriable
Room 3 - Closet (under floor tile)	Black mastic	7	Misc.	15 sf	I-Nonfriable
Room 4 - Living Room (under floor tile)	Black mastic	7	Misc.	200 sf	I-Nonfriable
The following homogeneous areas are located on the Second Floor of 1002 Robinson Drive:					
Area 6 - Corridor (under floor tile)	Black mastic	7	Misc.	60 sf	I-Nonfriable
Room 8 - Bedroom (under floor tile)	Black mastic	7	Misc.	90 sf	I-Nonfriable
Room 9 - Closet (under floor tile)	Black mastic	7	Misc.	10 sf	I-Nonfriable
Room 10 - Bedroom (under floor tile)	Black mastic	7	Misc.	180 sf	I-Nonfriable
Room 11 - Bedroom (under floor tile)	Black mastic	7	Misc.	100 sf	I-Nonfriable
The following homogeneous areas are located on the First Floor of 1006 Robinson Drive:					
Room 1 - Kitchen (under floor tile)	Black mastic	7	Misc.	290 sf	I-Nonfriable
Room 2 - Closet (under floor tile)	Black mastic	7	Misc.	25 sf	I-Nonfriable
Room 4 - Living Room (under floor tile)	Black mastic	7	Misc.	200 sf	I-Nonfriable
The following homogeneous areas are located on the Second Floor of 1006 Robinson Drive:					
Area 5 - Corridor (under floor tile)	Black mastic	7	Misc.	60 sf	I-Nonfriable
Room 7 - Bedroom (under floor tile)	Black mastic	7	Misc.	80 sf	I-Nonfriable
Room 8 - Closet (under floor tile)	Black mastic	7	Misc.	10 sf	I-Nonfriable
Room 9 - Bedroom (under floor tile)	Black mastic	7	Misc.	180 sf	I-Nonfriable
Room 10 - Bedroom (under floor tile)	Black mastic	7	Misc.	120 sf	I-Nonfriable
The following homogeneous area is located throughout 563 East Northern Avenue:					
Throughout structure¶ (In walls, above ceilings, & under floors)	Paper HVAC insulation on ducts	5	TSI	150 sf (total)	RACM-Friable

INVENTORY OF ASBESTOS-CONTAINING MATERIAL TABLE
SMHA MODERNIZATION PROJECT
SPRINGFIELD, OHIO

Material Location	Material Description	* Homo-geneous Area #	Type ACM	Estimated Quantity*	Category-Friable/ Nonfriable
The following homogeneous areas are located on the First Floor of 2122 Morgan Street:					
Living room (under 12" floor tile)	9" Brown floor tile and mastic	4	Misc.	340 sf	I-Nonfriable
Kitchen, laundry room and bathrooms (under 12" floor tile)	Black mastic	7	Misc.	340 sf (total)	I-Nonfriable
The following homogeneous area is located on the Second Floor of 2122 Morgan Street:					
Second Floor (under 12" floor tile)	9" Brown floor tile and mastic	4	Misc.	1,305 sf (total)	I-Nonfriable

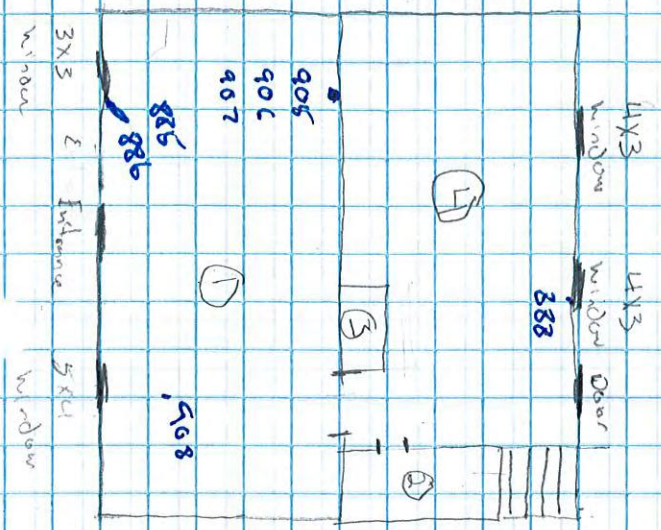
NOTES:
¶ = Material assumed to be present. Area inaccessible at time of inspection.
Misc. = Miscellaneous
sf = square feet
TSI = Thermal System Insulation

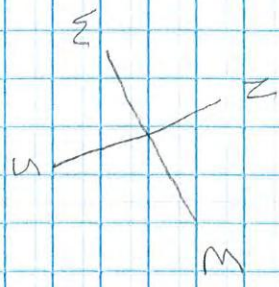
EPA Categories
RACM - Regulated Asbestos-Containing Materials (Friable)
Category I Nonfriable - resilient flooring, roofing products, gaskets, packings
Category II Nonfriable - all other nonfriable asbestos-containing materials

Attachment 6

SAMPLE LOCATION DRAWINGS

Luke Winter
11/4/25
25-0165
1002 Robinson Dr
Springfield, Old
RDA Group



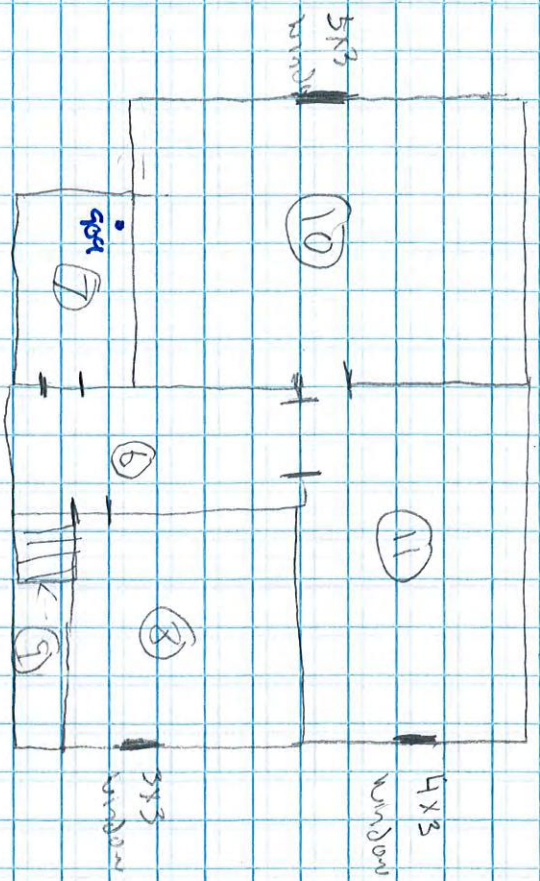


1002
First Floor Map

1/6

Luke Winter
11/4/25
25-0165
1002 Robinson Dr
RDIS Group

1002
2nd floor Map



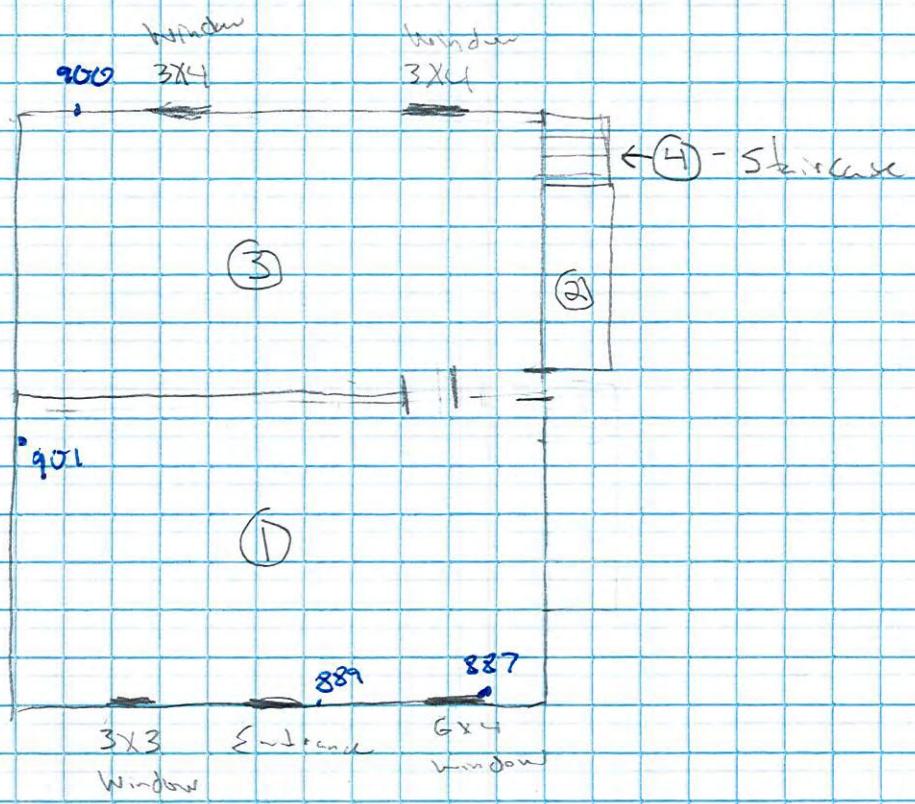


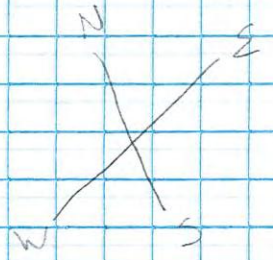
4/6

Luke Winter
1006 Robinson rd
RDA Groupe
25-0165

1006
First Floor Map

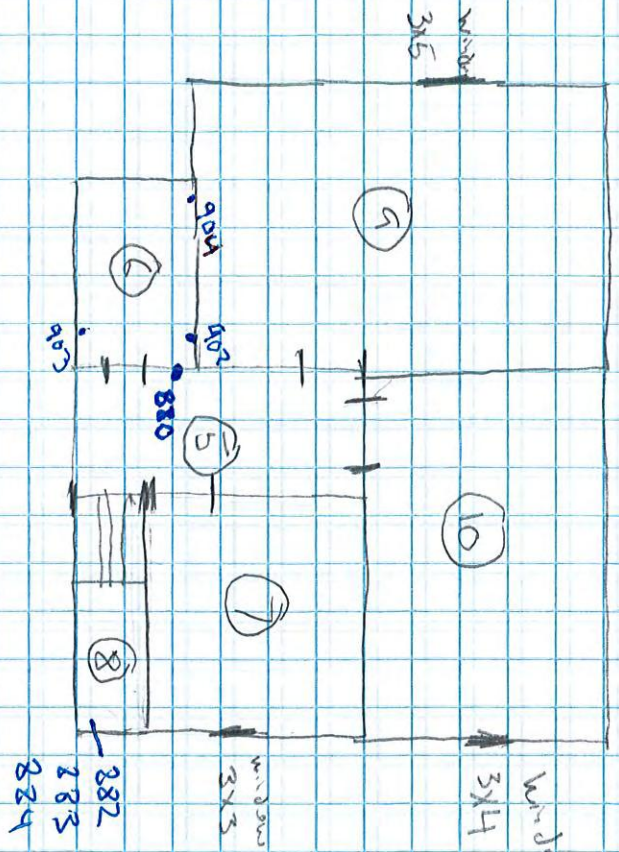
1/4

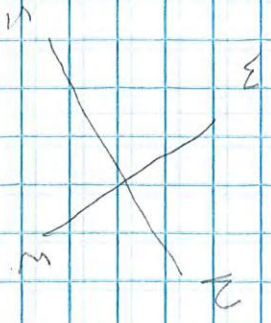




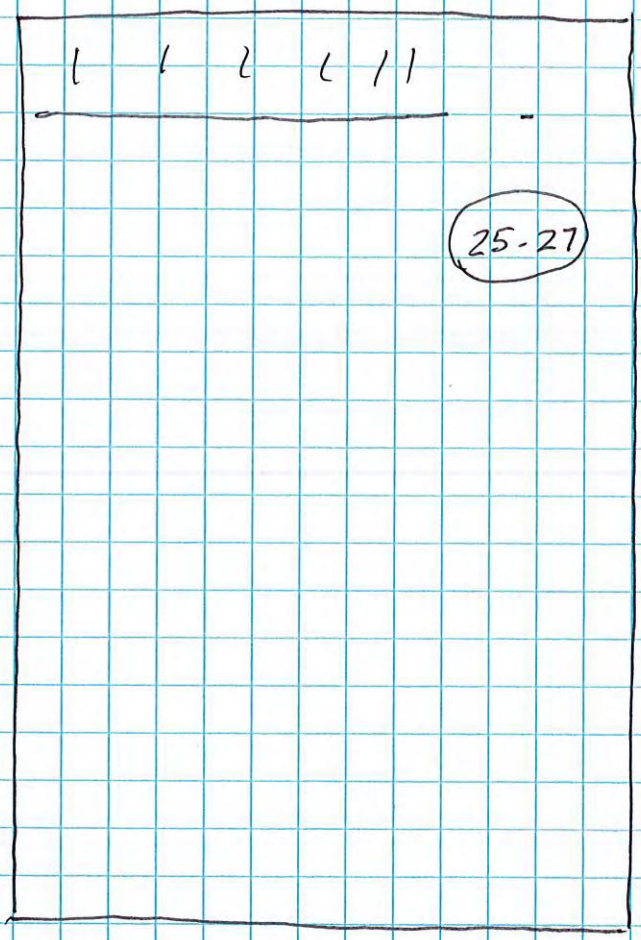
Luke Winkler
1006 Robinson Dr
RDA Group
25-0165

1006
2nd Floor Map



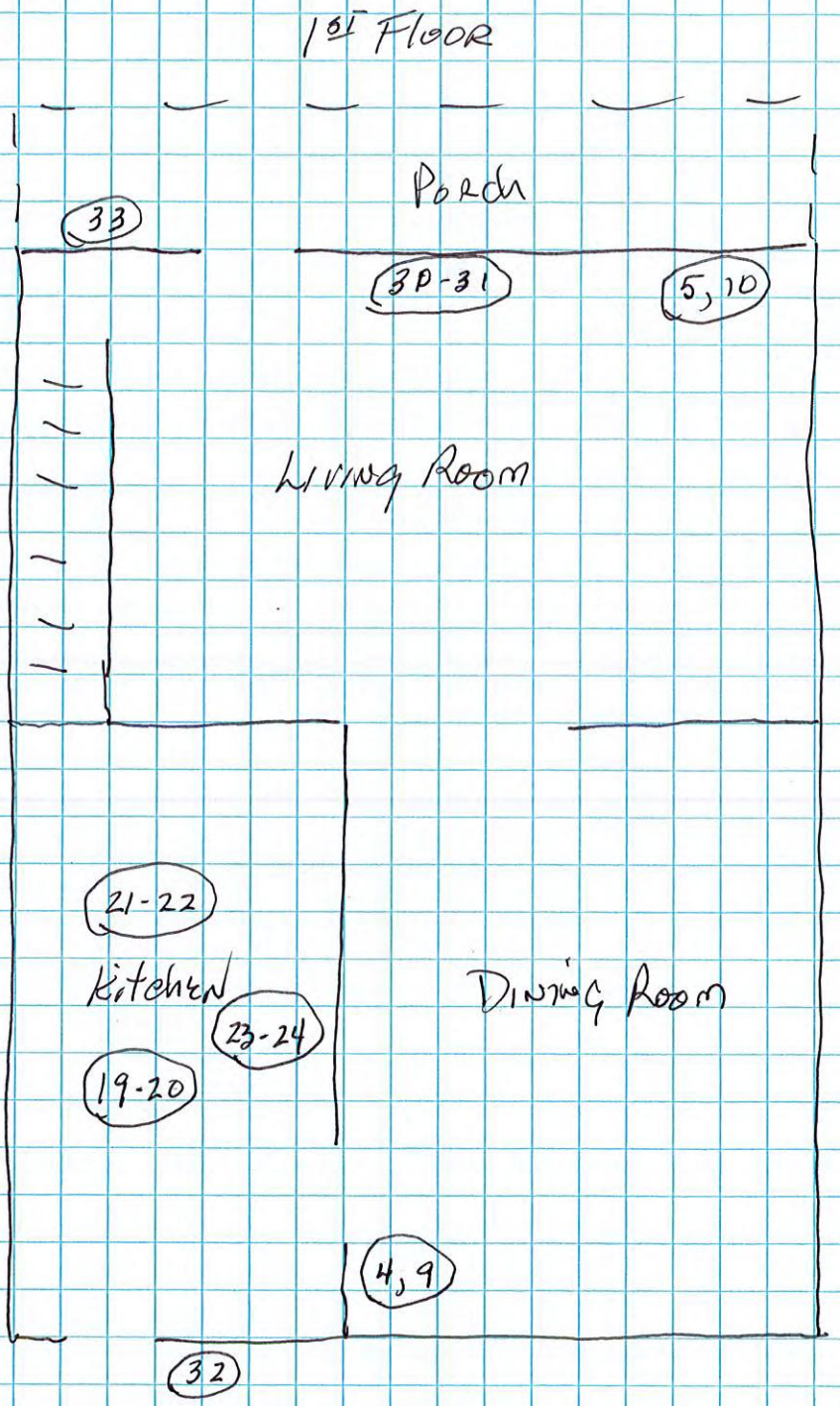


BASEMENT



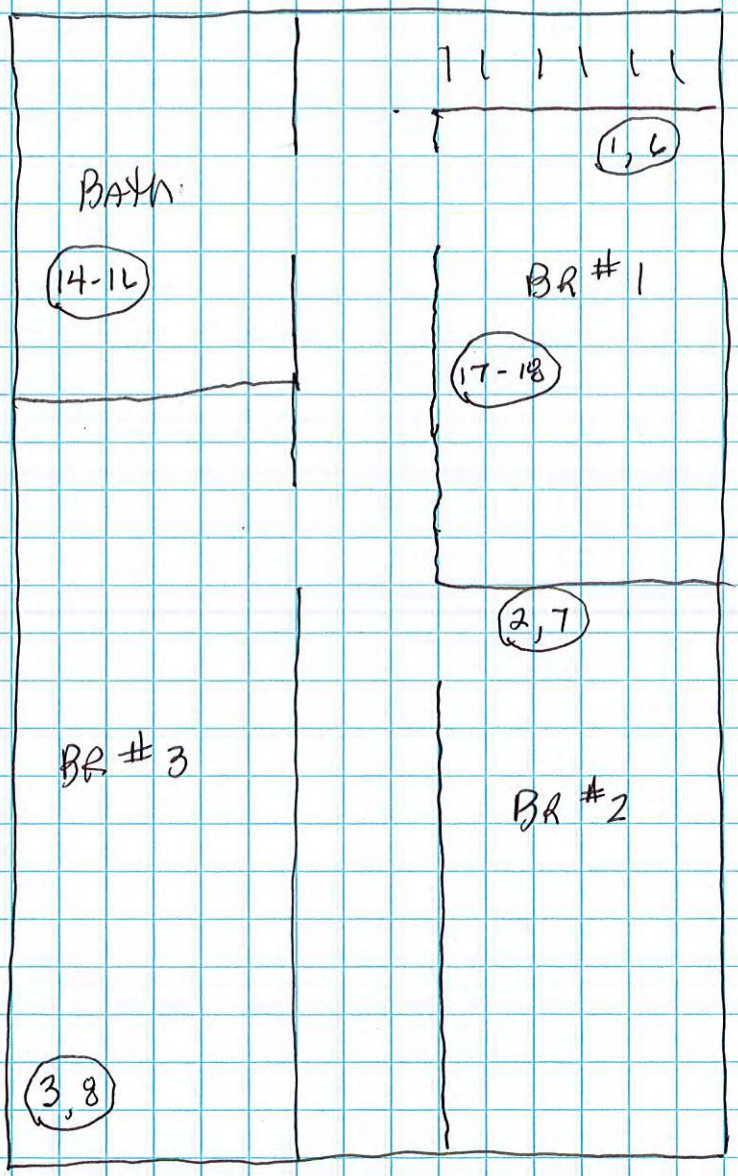
563 E. Northern Ave.

Springfield, Ohio



563 E. Northern Ave
Springfield, Ohio

2nd Floor 563

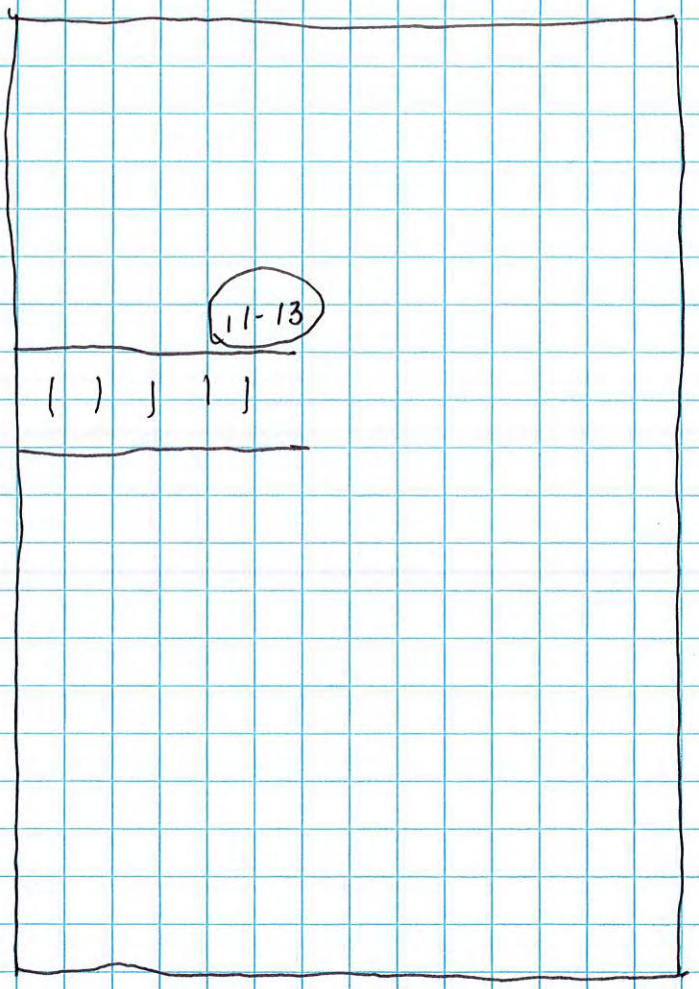


543 E. Northern Ave.

Springfield, Ohio

563

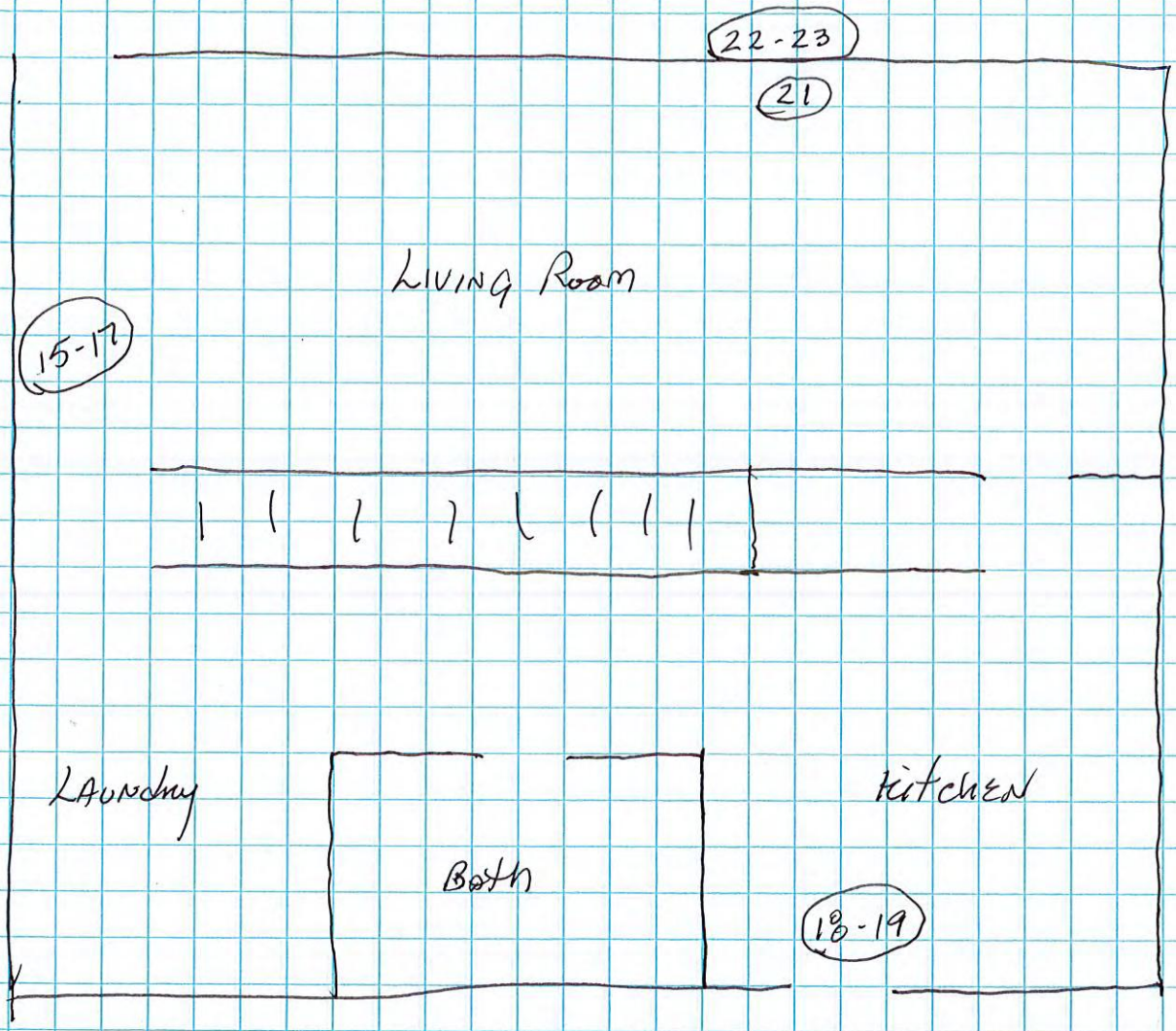
Attic



563 E. Northern Ave.

Springfield, Ohio

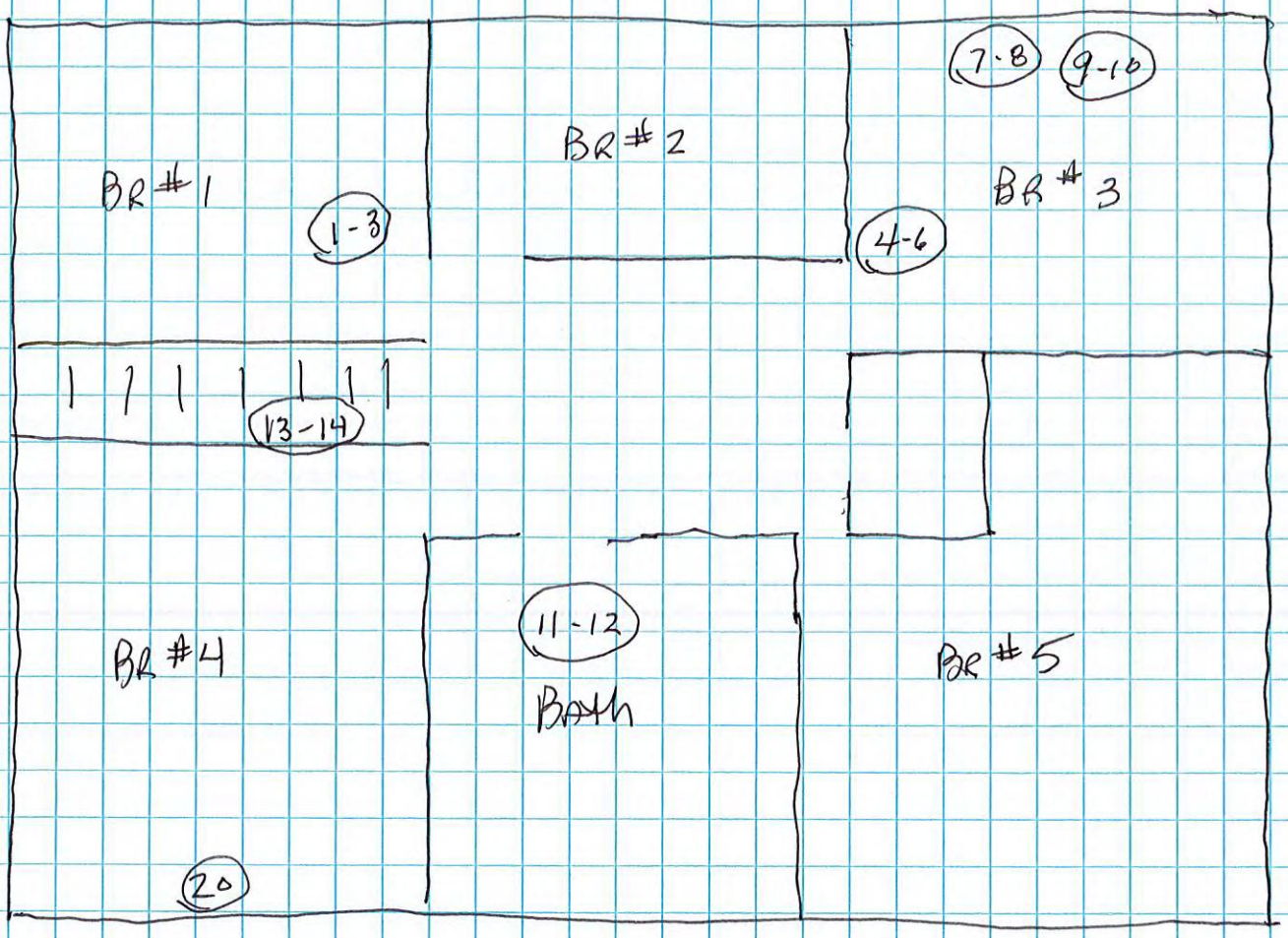
1st Floor



2122 Morgan Street

Springfield, Ohio

2nd Floor



2122 Morgan Street

Springfield, Ohio

SECTION 03 01 00 - MAINTENANCE OF CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete surface repair.
   2. Concrete crack repair.
   3. Concrete sealer.

1.2 SUBMITTALS

A. Product Data: Submit product standards, physical and chemical characteristics, technical specifications, limitations, maintenance instructions, and general recommendations regarding each material.
   1. Concrete repair products.

B. Samples: Submit color samples for patches exposed to view in finished construction and required to match existing.

C. Manufacturer's Instructions: Submit mixing instructions.

1.3 MOCK-UP

A. Construct mockup panel illustrating patching method, color and texture of repair surface.

B. Prepare one mockup of each type of patching/repair procedure.

C. Locate where directed by Architect.

D. Incorporate accepted mockup as part of Work.

PART 2 PRODUCTS

2.1 BASIS OF DESIGN

A. General basis of design for all systems is SIKA, other manufacturers accepted provided bidder/contractor submission of complete technical data of proposed products/systems for review by Architect.

2.2 CONCRETE SELF-LEVELING UNDERLAYMENT MIX

A. Concrete Leveling Mix: one-component, fast drying, cementitious skim mortar ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level SkimCoat
   1. Flexural strength ASTM C-293: 1,300 psi at 28 days.
   2. Compressive strength ASTM C-109: 3,700 psi at 28 days

B. Concrete Leveling Mix: one-component, polymer modified, self-leveling underlayment ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level-125
   1. Flexural strength ASTM C-293: 1,150 psi at 28 days.
   2. Compressive strength ASTM C-109: 4,000 psi at 28 days

C. Concrete Leveling Mix: one-component, cementitious underlayment, self-leveling underlayment ideal for repair or reprofiling of concrete slabs. Zero feather edge to ½" thickness application. Sika, Sika Level-325
   1. Flexural strength ASTM C-293: 1,500 psi at 28 days.
   2. Compressive strength ASTM C-109: 5,300 psi at 28 days

2.3 CONCRETE REPAIR / CEMENTITIOUS MORTAR –PARTIAL DEPTH REPAIRS

A. Concrete Repair/Patch Cementitious Mortar: one-component, rapid hardening [ASTM C-928], early strength gaining, cementitious mix for repairs on horizontal surfaces.
   1. Flexural strength ASTM C-293: 1,000 psi at 28 days.
   2. Bond strength ASTM C-882: 2,500 psi at 28 days,
   3. Compressive strength ASTM C-109: 7,000 psi at 28 days

B. Sika, SikaQuick 1000 or Equal

2.4 CONCRETE INJECTION REPAIR

A. Concrete Crack Injection Repair [Water Intrusion Repair]: low viscosity, expanding, polyurethane chemical grout designed to form flexible gaskets or plug joints and cracks in concrete from water infiltration.
   1. Sika, SikaFix HH LV or Equal.

B. Concrete Crack Injection Repair [Structural Crack Repair]: 2 multi-component, low viscosity, fast curing, epoxy sealing system for the repair of cracks in solid concrete substrates
   1. Sika, Sikadur Crack Repair Kit

2.5 CONCRETE SEALER

A. Concrete Sealer for new and existing concrete slabs on grade. Solvent based liquid membrane forming curing compound to seal surfaces with abrasion and stain resistant coating, non-yellowing resin. 100% acrylic polymer blend, fast drying solvent blend.
   1. SIKA Scofield Cureseal 100

PART 3 EXECUTION

3.1 REMOVALS

A. Remove all existing finish flooring – tile, VCT, epoxy paint from the existing concrete slabs. Remove/strip sealer from existing unfinished concrete slabs.

B. Prep existing concrete / substrate for new floor systems as specified.

3.2 EXAMINATION

A. Verify surfaces are ready to receive work.

B. Beginning of installation means acceptance of existing surfaces.

3.3 PREPARATION

A. Provide all temporary shoring and bracing as required for intended work.

B. Provide all required formwork, tools, and equipment as required for intended work.

C. Clean concrete surfaces of dirt, laitance, corrosion, or other contamination; wire brush using water; rinse surface and allow to dry.

D. Flush out cracks and voids with chemical solvent or water to remove laitance and dirt. Chemically neutralize by rinsing with water.

E. For areas patched with epoxy mortar, remove all broken and soft concrete. Remove corrosion from steel. Clean surfaces mechanically; wash with acid; rinse with water.

3.4 APPLICATION –CEMENTITIOUS MORTAR PARTIAL DEPTH REPAIR

A. Clean all surfaces of contaminants.
   1. Clean and prep all exposed reinforcing steel.
   2. Replace deteriorated reinforcing steel with new as indicated on the drawings.

B. Prime substrate in accordance with manufacturer requirements.

C. Mixing: mechanically mix per manufacturer requirements. Mix to a uniform consistency with a thorough mixing and proper proportioning of the two components.
   1. Add 3/8" course aggregate at desired quantity to uniform consistency as necessary.

D. Screed level.

E. Finish with float or light broom finish in accordance with approved mockup for desired finish texture.

F. Cure concrete per ACI recommendations using wet burlap, water mist,
   1. Do not use curing compounds for curing of concrete.

G. Avoid contact with aluminum materials to prevent adverse chemical reaction and possible failure of the repair. Insulate potential areas of contact by coating aluminum with epoxy.

3.5 APPLICATION – SELF-LEVELING MORTAR REPAIR

A. Prepare concrete by mechanical means, shot blast, sandblast, scarifying to achieve a matt, glaze free open textured surface.

B. Prime substrate in accordance with manufacturer requirements.

C. Mixing: mechanically mix per manufacturer requirements. Mix to a uniform consistency with a thorough mixing and proper proportioning of the two components.

D. Install in accordance with manufacturer requirements using a flat edge steel trowel.

E. Screed level.

3.6 APPLICATION – WATER INTRUSION INJECTION REPAIR

A. Prepare concrete and crack surface per manufacturer requirements. If the crack is wide or high water flows are encountered, seal the surface of the crack with a surface sealing material.

B. Mix the materials per manufacturer requirements.

C. Drill ports into the concrete intersecting with the crack at the mid-point of the wall thickness. Space ports per conditions / manufacturer requirements. Flush holes to prep.

D. Apply crack injection system per manufacturer instructions.

3.7 APPLICATION – STRUCTURAL INJECTION REPAIR

A. Prepare concrete and crack surface per manufacturer requirements. Cracks should not have excess or standing water.

B. Mix the materials per manufacturer requirements.

C. Drill ports into the concrete intersecting with the crack at the mid-point of the wall thickness. Space ports per conditions / manufacturer requirements. Flush holes to prep.

D. Apply crack sealer over the crack between the injection ports.

E. Apply crack injection system per manufacturer instructions.

3.8 APPLICATION – CONCRETE SEALER

A. Prep and clean surface per manufacturer requirements – clean from all prior sealers, curing compounds, oils, and foreign matters that may prevent penetration or adhesion. Meet Concrete Surface Profile of 1.

B. Distribute / Apply sealer per manufacturer requirements. Apply with garden sprayer and back roll with roller.

3.9 SCHEDULE / GENERAL REPAIR SCOPE

A. Clean / prep all existing concrete slabs after removal of existing floor finishes.

B. Remove all existing surface coatings, adhesives, mortar, etc. and patch repairs.

C. Remove all existing spalling and previous repair areas/patches.

D. Apply cementitious repairs to all areas of affected surfaces and to level various areas of the concrete slab between spaces within the building.
   1. Intent of repairs is to provide a smooth, uniform, floor slab free of voids, divots, and other irregularities in the finish, ready for a new finish floor system. Repairs shall be from edge to edge, across the entire floor system without exception.
   2. Floor repairs shall be accomplished to the satisfaction of the finish floor manufacturer / system as specified. Contractor to coordinate all requirements, and provide scope for the same.

E. Apply sealant [Sika, Sikaflex 1A or Equal] to joints and cracks.

F. Repair cracks in existing foundation systems as applicable to the conditions such as water leaks or structural repairs.

G. Prepare for new finishes to concrete surfaces as indicated.

H. Apply sealer to new / existing concrete where noted and concrete is intended to be left exposed.

END OF SECTION

SECTION 03 30 00 - CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Formwork.
   2. Reinforcement and Accessories.
   3. Cast-in place concrete.
   4. Finishing and curing.

1.2 SYSTEM DESCRIPTION

A. Design, engineer and construct formwork, shoring and bracing in accordance with ACI 301 to conform to design and applicable code requirements to achieve concrete shape, line and dimension as indicated on Drawings or required by proposed work.

B. Vapor Retarder Permeance: Maximum 1 perm when tested in accordance with ASTM E96/E96M, water method.

1.3 SUBMITTALS

A. Design Data: Submit mix designs, admixtures, reinforcement, and anchors.

1.4 QUALITY ASSURANCE

A. Construct and erect concrete formwork, reinforcing, and cast-in-place concrete in accordance with ACI 301.

PART 2 PRODUCTS

2.1 FORM MATERIALS AND ACCESSORIES

A. Form Materials: At discretion of Contractor.

B. Form Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

C. Slab Edge Joint Filler: ASTM D1751, Premolded asphaltic board, 1/2 inch thick. As applicable to conditions.

2.2 REINFORCEMENT MATERIALS AND ACCESSORIES

A. Reinforcing Steel: ASTM A615, Grade 60 [60 ksi yield], deformed bars to suit condition and application, uncoated finish.

B. Plain-Steel Welded Wire Reinforcement: ASTM A 1064; plain, flat sheets; unfinished.

C. Joint Dowel Bars: ASTM A615, Grade 60, plain-steel bars, cut bars to length with ends square and free of burrs.

D. Bar Supports; Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place.
   1. Manufactured from steel wire, plastic, or precast concrete per CRSI's "Manual of Standard Practice", of greater strength than concrete.

E. Fabricate concrete reinforcement in accordance with ACI 301.

2.3 VAPOR BARRIER AND ACCESSORIES

A. Vapor Retarder: ASTM E 1745, Class A; clear polyethylene film;

1. Thickness: 10 mil thick
2. Permeance Rating: ASTM E 96, 0.01 Perms or less

B. Seam / Transition Tape: Tape with pressure sensitive or double sided adhesive. Minimum width of 4 inches. Provide and install / detail as recommended by manufacturer.

2.4 GRANULAR / AGGREGATE BASE

A. Crushed Stone / gravel: Narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTM D 448; ODOT Item No. 304, Aggregate Base; with 100 percent passing a 2-inch sieve and 90 to 33 percent passing a No. 30 sieve.

B. Exterior Slabs:
1. Per Civil Drawings.

2.5 CONCRETE MATERIALS

General: Source Limitations: Obtain each type of class or cementitious material of same brand from same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

A. Cement: ASTM C 150, Normal-Type I Portland type.

B. Normal-Weight Aggregates: ASTM C33, Class 3M coarse aggregate or better.
1. Fine Aggregates: clean, sharp, natural sand free from loan, clay lumps, or other deleterious substances.
2. Coarse Aggregates: Clean, uncoated, processed aggregate containing no clay, mud, load, or foreign matter as follows: Crushed stone, Washed gravel [either natural or crushed] [no pit run gravel is permitted]
3. Coarse Aggregates in Exterior Concrete: crushed limestone, ASTPM C33, Class 4S or better.
4. Aggregate Size: not larger than 1/5 of the narrowest dimension between sides of forms, 1/3 of the depth of the slab, nor 3/4 of the minimum clear spacing between individual reinforcing bars or bundles of bars.

C. Lightweight Concrete Aggregate: ASTM C330

D. Water: ASTM C 1602, Clean and not detrimental to concrete.

2.6 CONCRETE MIX

A. Ready-Mixed Concrete, Measure, batch, mix, and deliver concrete in accordance with ASTM C94, Option A, and ASTM C 1116 [all concrete to be transit mixed, furnish batch ticket information upon request]

B. TRENCH FOOTINGS, FOOTINGS / INTERIOR FOUNDATIONS:
1. Strength = 3,500 PSI [28 day]
2. Max W/C Ratio = 0.55
3. Slump Limit: not less than 1" and not more than 3" at point of placement

C. FOUNDATION AND RETAINING WALLS EXPOSED TO WEATHER:
1. Strength = 4,500 PSI [28 day]
2. Max W/C Ratio = 0.45
3. Slump Limit: not less than 1" and not more than 3" at point of placement
4. Air Entrainment = 5.0% +/- 1.5% at point of delivery

D. INTERIOR FORMED CONCRETE EXPOSED TO VIEW
1. Strength = 4,000 PSI [28 day]
2. Max W/C Ratio = 0.45

E. EXPOSED INTERIOR CONCRETE SLAB ON GRADE [AND CARPETED FLOOR SLABS]

1. Strength = 4,000 PSI [28 day]
2. Max W/C Ratio = 0.45
3. Slump Limit: 4” plus or minus 1”, before adding water reducing or plasticizing admixtures, max. slump of 6”. Do not use high range water reducers.
4. Air Entrainment = Do not allow air content of troweled finished to exceed 3%

F. INTERIOR CONCRETE SLAB ON GRADE TO RECEIVE THIN-SET FLOORING, RESILIENT, OR OTHER FLOORING TYPES:
1. Strength = 4,000 PSI [28 day]
2. Max W/C Ratio = 0.45
3. Use mid-range water reducer.
4. Slump Limit: 4” plus or minus 1”, before adding water reducing or plasticizing admixtures, max. slump of 6”. Do not use high range water reducers.
5. Air Entrainment = Do not allow air content of troweled finished to exceed 3%

G. EXTERIOR WALKS, STOOPS, APRONS, CURBS, EXTERIOR CONCRETE EXPOSED TO VIEW / WEATHER, INCLUDING LIGHT POLE BASES, EQUIPMENT PADS:
1. Strength = 4,500 PSI [28 day]
2. Max W/C Ratio = 0.45
3. Use mid-range water reducer.
4. Air Entrainment = 5.0% +/- 1.5% at point of delivery

H. EXTERIOR PAVING
1. Strength = 4,500 PSI [28 day]
2. Max W/C Ratio = 0.40
3. Slump Limit: 5”, plus or minus 1” at point of placement
4. Air Entrainment = 6.0% +/- 1.5% at point of delivery

I. FLOWABLE FILL – TYPE 1 – UTILITY TRENCH BACKFILL
1. Strength = 50-100 PSI [28 day]
2. Unconfined compression strength per ASTM D 4832

J. FLOWABLE FILL – TYPE 2 – UNDER FOUNDATIONS
1. Strength = 85 PSI [28 day]
2. Unconfined compression strength per ASTM D 4832

K. LEAN CONCRETE FILL UNDER FOOTINGS / FOUNDATIONS
1. Strength = 1,500 PSI [28 day]
2. Max W/C Ratio = 0.55 for non-air entrained mix.

2.7 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Admixtures containing intentionally-added chlorides shall conform to limit consistent with ACI 318 and ACI 301.
1. Water-Reducing Admixture: ASTM C 494, Type A.
2. Retarding Admixture: ASTM C 494, Type B or D.
3. Accelerating Admixture: ASTM C 494, Type C or E.
4. Water-Reducing and Retarding Admixture: ASTM C 494, Type D.
5. Water-Reducing and Accelerating Admixture: ASTM C 494, Type E.
6. High-Range, Water-Reducing Admixture: ASTM C 494, Type F or G.
7. High-Range, Water-Reducing and Retarding Admixture: ASTM C 494, Type G.
8. Plasticizing and Retarding Admixture: ASTM C 1017, Type II.
9. Workability-Retaining Admixture: ASTM C494, Type S. Shall retain concrete workability without affecting time of setting or early-age strength development.

10. ASR-Inhibiting Admixtures: ASTM C494, Type S. Shall contain a nominal lithium nitrate content of 30 percent.
11. Other Specific Performance Admixtures: ASTM C494, Type S.

2.8 FIBER MESH REINFORCEMENT

A. Synthetic Fiber: ASTM C 1116, Type III, 1/2 to 1-1/2 inches long, fibrillated micro-polypropylene fibers

2.9 CURING MATERIALS

A. Evaporation Reducer: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. when dry.

C. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.

D. Curing Paper: Eight feet wide paper, consisting of two layers of fibered kraft paper laminated with double coating of asphalt.

E. Water: Potable or complying ASTM C1602 that does not cause staining of the surface.

F. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.

G. Clear, Waterborne, Membrane-Forming Curing and Sealing Compound (CSC): ASTM C 1315, Type 1, Class A.
   1. Use only where slabs receive no other type of coating or finish.

2.10 SEALERS

A. Penetrating Anti-Spalling Sealer (Exterior ramps, steps, and stoops): siloxane-based compound or silane modified siloxane emulsion formulated to reduce chloride ion absorption/intrusion by 80 percent when tested in accordance with NCHRP #244, Test Method Series II or IV tests. In addition, sealer-treated concrete shall exhibit no scaling when exposed to 125 cycles of freezing and thawing when tested in accordance with ASTM C 672.

B. Floor Sealer: ASTM C1315, Type I, Class A and ASTM C309, Type I, Class A and B. Acrylic water-based urethane clear sealer, non yellowing, resistant to blush, and satin finish as recommended by manufacturer for preventing staining by waterborne and oil substances.

2.11 ACCESSORIES

A. Expansion and Isolation-Joint-Filler Strips: ASTM D 1751, asphalt-saturated cellulosic fiber, ASTM D 1752, cork or self-expanding cork, or ASTM 4819, Type II, or ASTM D 1622 closed-cell compressible foam, 1/4 inch maximum thickness.

B. Bonding Agent: ASTM C 1059, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C 881, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:
   1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

D. Non-shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

PART 3 EXECUTION

3.1 FORMWORK ERECTION

A. Erect formwork, shoring and bracing to achieve design requirements.

B. Apply form release agent to formwork prior to placing form accessories and reinforcement.

C. Clean forms as erection proceeds, to remove foreign matter.

3.2 INSERTS, EMBEDDED COMPONENTS, AND OPENINGS

A. Provide formed openings where required for work to be embedded in and passing through concrete members.

B. Coordinate work of other sections in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, and other inserts.

C. Install concrete accessories straight, level, and plumb.

D. Place joint filler at perimeter of floor slab, penetrations, and isolation joints.

3.3 REINFORCEMENT PLACEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing and supplying reinforcement.
   1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.
   2. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

B. Accurately position, support, and secure reinforcement against displacement.
   1. Locate and support reinforcement with bar supports to maintain minimum concrete cover.
   2. Do not tack weld crossing reinforcing bars.

C. Preserve clearance between bars of not less than 1 inch, not less than one bar diameter, or not less than 1-1/3 times size of large aggregate, whichever is greater.

D. Provide concrete coverage in accordance with ACI 318.

E. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

F. Splices: Lap splices as indicated on Drawings.

G. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging.
   1. Support welded-wire reinforcement in accordance with CRSI “Manual of Standard Practice”.
   2. “Manually” pulling or lifting reinforcement into place during placement of concrete is not acceptable method of placing reinforcement.
   3. Lap edges and ends of adjoining sheets at least one mesh spacing plus 2 inches for plain wire and 8 inches for deformed wire.
   4. Offset laps of adjoining sheet widths to prevent continuous laps in either direction.
   5. Lace overlaps with wire.

H. Provide sufficient numbers of supports and of strength to support reinforcement in correct position. Do not place reinforcing bars more than 2 inches beyond last leg of continuous bar support. Do not use supports as bases for runways for concrete conveying equipment and similar construction loads.

I. Reinforcing steel installed in continuous footings shall run continuous. This shall include specially shaped components with proper lap where corner reinforcing and step footings occur.

J. Provide additional reinforcing around required openings in footings and slabs having a one foot least dimension.

K. Support welded wire fabric in slabs-on-ground with precast concrete bricks at 2 feet spacing in both directions.

L. Provide continuous chairs or bolsters to support welded wire fabric in elevated slabs at each line of support for steel deck (e.g., at centerline of supporting joists or beams) and as required to support reinforcing steel in correct position.

M. It is not acceptable to lift mesh into place during concrete placements

3.4 VAPOR BARRIER INSTALLATION

A. Vapor Barriers: Place, protect, and repair vapor barriers according to ASTM E 1643 and manufacturer's written instructions.
   1. Place vapor barrier directly below slab and above drainage fill.
      a. Face laps away from expected direction of concrete pour whenever possible.
   2. Extend vapor barrier over footings and seal to foundation wall, grade beam, or slab at an elevation consistent with top of slab or terminate at impediments such as waterstops or dowels. Seal around penetrations such as utilities and columns in order to create a monolithic membrane between surface of slab and moisture sources below slab as well as at slab perimeter. Seal top edge with continuous bead of high-grade mildew resistant silicone sealant or manufacturer’s tape.
   3. Lap joints minimum 6 inches, or as instructed by manufacturer, and seal laps in accordance with manufacturer’s recommendations in a manner consistent with ASTM E1643.
   4. Seal all penetrations (including pipes) with manufacturer’s pipe boot or manufacturer’s instructions.
   5. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged areas 6 inches and sealing all four sides with tape.

3.5 PLACING CONCRETE

A. General: Comply with ACI 301.

B. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.
   1. Immediately prior to concrete placement, inspect vapor retarder for damage and deficient installation, and repair defective areas.

C. Place concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness.
   1. If a section cannot be placed continuously, provide construction joints as indicated.
   2. Place concrete to avoid segregation.
   3. Place concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
   4. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
      a. Do not use vibrators to transport concrete inside forms.
      b. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inches into preceding layer.
      c. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity.
      d. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.
   5. Concrete shall be completely placed within 1-1/2 hours after entering conveying drum.
   6. Pumped Concrete: Comply with ACI 304R.

D. Place and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.
   1. Do not place concrete floors and slabs in a checkerboard sequence.
   2. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
   3. Maintain reinforcement in position on chairs during concrete placement.
   4. Screed slab surfaces with a straightedge and strike off to correct elevations.
   5. Level concrete, cut high areas, and fill low areas.
   6. Slope surfaces uniformly to drains where required.
   7. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on surface. Do not further disturb slab surfaces before starting finishing operations.
   8. Do not further disturb slab surfaces before starting finishing operations.

E. Prepare previously placed concrete by cleaning with steel brush and applying bonding agent.

F. Place concrete continuously between predetermined expansion, control and construction joints. Do not break or interrupt successive pours creating cold joints.

G. Separate slabs-on-grade from vertical surfaces with 1/2 inch thick joint filler, extended from bottom of slab to within 1/4 inch of finished slab surface.

H. Where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack with non-shrink grout.

3.6 FORM REMOVAL

A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.

B. Remove formwork progressively and in accordance with code requirements.

3.7 FINISHING FORMED SURFACES

A. As-Cast Surface Finishes:
   1. Rough-Formed Finish: ACI 301 surface finish as-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
      a. Apply to concrete surfaces not exposed to public view.
   2. Smooth-Formed Finish: ACI 301 surface finish as-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.
      a. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, and to be covered with a coating or covering material applied directly to concrete.

B. Rubbed Finish: Apply following to smooth-formed finished as-cast concrete where indicated:
   1. Smooth-Rubbed Finish:
      a. Not later than one day after form removal.
      b. Moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture.
      c. If sufficient cement paste cannot be drawn from concrete by rubbing process, use a grout made from same cementitious materials used in in-place concrete.
   2. Grout-Cleaned Finish:
      a. Clean concrete surfaces after contiguous surfaces are completed and accessible.
      b. Do not clean concrete surfaces as work progresses. Wet concrete surfaces and apply grout of a consistency of thick paint to coat surfaces and fill small holes.

c. Mix one part Portland cement to one and one-half parts fine sand with a 1:1 mixture of bonding admixture and water. Add white Portland cement in amounts determined by trial patches so color of dry grout will match adjacent surfaces.
d. Wet concrete surfaces.
e. Scrub grout into voids and remove excess grout. When grout whitens, rub surface with clean burlap and keep surface damp by fog spray for at least 36 hours.

C. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces, unless otherwise indicated.

3.8 FLOOR FINISHING

A. General Information (Slabs-on-Grade): Requirements indicated are based upon latest FF/FL method.
1. Comply with ACI 302.1R recommendations for screeding, restraightening and finishing operations for concrete surfaces. Do not wet concrete surfaces.
2. Finish surfaces to the following tolerances, in accordance with ASTM E 1155.

B. Float Finish:
1. Apply float finish to monolithic slab surfaces that are to receive a trowel finish.

C. Trowel Finish:
1. After applying float finish, apply first troweling and consolidate concrete by hard or power driven trowel.
2. Trowel Finish 1: Carpeted Floors, unless otherwise noted.
a. Apply trowel finish to monolithic slab surfaces that are to receive carpet and noncritical floors where slabs remain exposed, such as mechanical rooms, metal stair pan fill, and topping over precast deck, unless otherwise noted.
3. Trowel Finish 2: Floors with improved flatness/levelness requirements.
a. Apply trowel finish to monolithic slab surfaces that are to receive thin-set flooring, resilient flooring, linoleum flooring, fluid-applied flooring, resinous flooring and other flooring types, unless otherwise indicated.
4. Exposed Surfaces: Use steel-reinforced plastic power trowel blades (in lieu of steel) to control dark burnish marks on plain concrete or surface to receive: stain, dye, shake-on, integral pigments, polished, or clear sealed.

D. Nonslip Broom Finish: Apply nonslip broom finish to exterior concrete platforms, steps and ramps, and elsewhere as indicated.
1. Immediately after float finishing, slightly roughen concrete surface by brooming with fiber bristle broom, perpendicular to main traffic route.

E. Maintain surface flatness, with maximum variation of 1/8 inch in 10 ft; Conform to ACI 117.

F. Control joints:
1. Locate at maximum of 12’-0” o.c. each way.
2. Sawcut joints permitted only at concealed concrete areas.
3. Trowel and re-trace joints at all exposed concrete areas.

3.9 CURING AND PROTECTION

A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
1. Protect concrete footings from freezing for a minimum of 7 days.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete for not less than 7 days.

C. Apply sealer on floor surfaces not receiving finish floor system.

3.10 ERECTION TOLERANCES

A. Install reinforcement within tolerances required by ACI 301.

3.11 FIELD QUALITY CONTROL

A. Perform field inspection and testing in accordance with ACI 301 at the request of Architect.

B. Field Testing:
   1. Measure slump and temperature for each compressive strength concrete sample.
   2. Measure air content in air entrained concrete for each compressive strength concrete sample.

C. Cylinder Compressive Strength Testing:
   1. Test Method: ASTM C39.
   2. Test Acceptance: In accordance with ACI 301.
   3. Test two cylinders at 28 days.
   4. Dispose remaining cylinders when testing is not required.

3.12 DEFECTIVE CONCRETE

A. Modify or replace concrete not conforming to required lines, details and elevations, as directed by Architect.

END OF SECTION

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SECTION 04 01 00 - MAINTENANCE OF MASONRY

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Repointing masonry, Parging, Water and/or chemical cleaning of masonry surfaces, water repellent.

1.2 SUBMITTALS

A. Product Data: Submit data on cleaning solutions, water repellent.

B. Manufacturer's Installation Instructions: Products selected for use, manufacturer's installation instructions.

1.3 QUALITY ASSURANCE

A. Perform Work according to ACI 530 and ACI 530.1 requirements.

B. Installer: Company specializing in performing Work of this Section with three years' experience.

C. Coordinate work with masonry repairs, re-pointing, limited brick replacement, etc.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Repoint mortar joints and repair masonry only when air temperature is between and 40°f and 90°f and is predicted to remain so for at least 7 days after completion of work.
   1. In accordance with ACI 530.1

B. Hot-weather requirements: protect masonry repair and mortar-joint pointing when temperature and humidity conditions produce excessive evaporation of water from mortar and repair materials. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 90°f and above.
   1. In accordance with ACI 530.1

C. Patch masonry only when air and surface temperatures are between and 55°f and 100°f and are predicted to remain above 55°f for at least 7 days after completion of work. On days when air temperature is predicted to go above 90°f, schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.

D. Provide shoring, bracing, or support to prevent movement, settlement, or collapse of structure, work under demolition, or adjacent work to remain.

E. Prevent grout or mortar used in assembly and repair work from staining face of surrounding surfaces. Immediately remove grout and mortar in contact with exposed surfaces.

F. Protect sills, ledges, and projections from mortar droppings.

1.5 SEQUENCING

A. Perform repointing after cleaning masonry surfaces.

PART 2 PRODUCTS

2.1 MORTAR

A. Refer to Section 04 20 00.

2.2 MASONRY RESTORATION AND CLEANING

A. Cleaning Agent: Low Acid Cleaning Solution; Prosoco Sure Klean Light Duty Restoration Cleaner, Sure Klean Restoration Cleaner, or Equal.

2.3 WATER REPELLENT

A. Free flowing, colorless liquid, non water based.
   1. ProSoCo, 'Sure Klean', Weather Seal Siloxane PD'
   2. Diedrich Chemicals, 303S-7 Siloxseal'

2.4 PARGING

A. Air Barrier and Waterproof Cement Based Coating for Concrete and masonry. Resists both positive and negative hydrostatic pressure. Polymer modified.
   1. SIKA Thoroseal – 581 with Acryl 60.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces to be cleaned are ready for Work of this Section.

3.2 PREPARATION

A. Close off and/or seal areas, landscaping, materials, and surfaces not receiving work of this Section to protect from damage.

3.3 FINAL CLEANING

A. After mortar has fully hardened, thoroughly clean exposed masonry surfaces of excess mortar and foreign matter; use wood scrapers, stiff-nylon or -fiber brushes, and clean water, spray applied at low pressure. Do not use metal scrapers or brushes. Do not use acidic or alkaline cleaners.

B. Clean masonry debris from roof; remove debris from gutters and downspouts. Rinse off roof and flush gutters and downspouts.

C. Sweep and rake adjacent pavement and grounds to remove masonry debris. Where necessary, pressure wash surfaces to remove mortar, dust, dirt, and stains.

3.4 GENERAL CLEANING

A. As work proceeds and on completion, remove excess mortar, smears, droppings.

B. Clean dirt and light staining from all brick surfaces.

C. If the specified chemicals and cleaning processes do not remove graffiti, paint, or other stains, contact Architect for direction.

D. Perform cleaning working from top to bottom working in sections around the building at one elevation at a time.

E. Use spray equipment that provides controlled application at volume and pressure indicated. Adjust pressure and volume to ensure cleaning methods do not damage masonry.

3.5 REPOINTING MASONRY

A. Joint raking: rake out all joints to be pointed by hand, using a mason's chisel that is not more than 1/4" thick or by approved hand grinding methods. If grinding is used, wet methods are required to minimize dirt and dust. Rake or grind out mortar from joints to depths equal to 2-1/2 times their widths but not less than 1-inch nor less than required to expose sound, un-weathered mortar.
   1. Remove mortar to provide reveals with square backs and to expose masonry for contact with pointing mortar. Brush, vacuum or flush joints to remove dirt and loose debris. No abrasive methods of cleaning shall be used.
   2. Do not spall edges of masonry units or widen joints. Replace masonry units which become damaged.

a. Do not use power-operated grinders without Architect's written approval based on submission by Contractor of a satisfactory quality-control program and demonstrated ability of operators to use tools without damaging masonry. Quality control program shall include provisions for supervising performance and preventing damage due to worker fatigue.

3. Replace any units which become damaged.
4. if the existing bricks have worn rounded edges, recess final mortar slightly from face to a point where joint face will not be wider than the original joint.

B. Joint Pointing:
1. Rinse masonry joint surfaces with water to remove any dust and mortar particles. Time application of rinsing so that, at time of pointing, excess water has evaporated or run off, and joint surfaces are damp but free of standing water.
2. Apply first layer of pointing mortar to areas where existing mortar was removed to depths greater than surrounding areas. Apply in layers not greater than 3/8-inch until uniform depth is formed. Compact each layer thoroughly and allow to become thumbprint-hard before applying next layer.
3. After joints are filled to uniform depth, place remaining pointing mortar in 3 layers with each of first and second layers filling approximately 2/5 of joint depth and third layer the remaining 1/5. Fully compact each layer and allow to become thumbprint-hard before applying next layer. Take care not to spread mortar over edges onto masonry surfaces, or to featheredge mortar.
4. When mortar is thumbprint-hard, tool joints to match original appearance of joints as determined by the architect. Remove excess mortar from edge of joint by brushing.
5. Cure mortar by maintaining in damp condition for not less than 72 hours.

3.6 PARGING

A. Parge concrete/CMU foundation walls as follows:
1. Provide all required tuckpointing of mortar joints prior to parging.
2. Dampen masonry walls prior to parging.
3. Surface Preparation
a. Surface preparation is extremely important for proper adhesion. Substrates must be sound, and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants. Verify substrate has properly cured. Concrete should obtain 80% of design strength, typically achieved within 3 to 14 days. If efflorescence is present, mechanically remove it before proceeding.
b. All holes and cracks must be patched before installation.
c. Extremely smooth surfaces such as precast and cast-in-place concrete will require roughening or brush blast to ensure good adhesion.
4. Mixing
a. Thoroseal is to be mixed with a mixing liquid consisting of a blend of Acryl 60 diluted with water. Dilute and mix per manufacturer requirements.
b. Refer to manufacturer requirements for blending, consistency, and for pot life.
5. Application
a. Thoroseal may be applied with a brush or broom or equivalent stiff fiber brush. Spray application not permitted. The substrate must be completely dampened with water before application starts. Do not saturate the substrate, but keep it cool and damp throughout the application.
b. It is essential that the first coat be thoroughly worked into the substrate to completely fill and cover all voids, holes, and nonmoving cracks. Finish with a horizontal stroke for an even coat.
c. Allow to cure 24 hours, then apply the second coat and finish with a vertical stroke. Above grade, the second coat can be replaced with a Thoro high-build architectural coating to achieve better color uniformity.

d. On block or masonry walls, allow 5-7 days before applying second coat to eliminate joint read through.

B. Parge interior face of concrete/CMU foundation walls as follows:
   1. Provide all required tuckpointing of mortar joints prior to parging.
   2. Dampen masonry walls prior to parging.
   3. Surface Preparation
      a. Surface preparation is extremely important for proper adhesion. Substrates must be sound, and free of dust, dirt, laitance, paints, oils, grease, curing compounds, or any other contaminants. Verify substrate has properly cured. Concrete should obtain 80% of design strength, typically achieved within 3 to 14 days. If efflorescence is present, mechanically remove it before proceeding.
      b. All holes and cracks must be patched before installation.
      c. Extremely smooth surfaces such as precast and cast-in-place concrete will require roughening or brush blast to ensure good adhesion.
   4. Mixing
      a. Mix Portland cement, sand, and bonding agent.
      b. Thoroseal is to be mixed with a mixing liquid consisting of a blend of Acryl 60 diluted with water. Dilute and mix per manufacturer requirements.
      c. Refer to manufacturer requirements for blending, consistency, and for pot life.
   5. Application
      a. Apply scratch coat with a trowel, approximately 3/8 inch to 3/4 inch in thickness, bonding to face of existing wall.
      b. Apply fiberglass reinforcing mesh to existing cracks or joints for crack control.
      c. Apply finish coat.
      d. Smooth and cure with a damp sponge and keep surfaces damp to allow for proper curing and to prevent cracking.
      e. Thoroseal may be applied with a brush or broom or equivalent stiff fiber brush. Spray application not permitted. The substrate must be completely dampened with water before application starts. Do not saturate the substrate, but keep it cool and damp throughout the application.
      f. It is essential that the first coat be thoroughly worked into the substrate to completely fill and cover all voids, holes, and nonmoving cracks. Finish with a horizontal stroke for an even coat.

3.7 FINAL CLEANING

A. Where re-pointing work precedes cleaning of masonry, allow mortar to harden at least 30 days prior to final cleaning.

B. After mortar has fully hardened, thoroughly clean exposed masonry surfaces using stiff nylon or fiber brush and clean water, spray applied at low pressure.

3.8 SURFACE CLEANING APPLICATION

General: Cleaners shall be installed in accordance with the recommendation of the manufacturer.

A. All masonry surfaced shall be cleaned utilizing a pressure water spray (1,000 p.s.i. max.).
   1. Intent of cleaning program is to remove all surface staining, smoke, dirt, and fungal growth.

3.9 WATER REPELLANT APPLICATION

General: Water repellant shall be installed in accordance with the recommendation of the manufacturer.

A. All masonry surfaced shall have the water repellant installed utilizing a low-pressure water spray (50 psi max.), brush or roller at the rate recommended by the manufacture. Flow coat to saturation point, allow for penetration 5 -10 minutes.

3.10 SCHEDULES

A. General: verify all existing masonry conditions, including anchorage to substrate, to determine scope of masonry repairs. Refer to drawings and additional work allowances to be included in the bid.

B. CMU Foundations: Tuckpoint exposed mortar joints in CMU foundation wall where required and were indicated on drawings.

C. Parging: Parge exposed CMU foundation walls where indicated on drawings. Install new parging/coating system over entire exposed foundation wall. Extend parging below existing finish grade by approximately 6” to 8”.

D. Parging Interior Face of Basement Foundation walls: Parge exposed CMU foundation walls where indicated on drawings. Install new parging / coating system over foundation wall from the slab up to the exterior finish grade at a minimum.

E. Limestone Sills: Remove and reset all limestone sills that are loose, displaced, or disbonded. If stone is cracked, broken, or missing, install a new limestone sill to match existing.
   1. Replacement will be a field change if needed.

F. Masonry Repairs:
   1. Remove damaged, cracked, spalled, or dislocated masonry units as required by conditions.
   2. Replace damaged masonry with new or salvaged masonry as applicable to the repair. Install new masonry per Section 04 20 00. Tooth into existing masonry as appropriate.

G. Masonry Tuckpointing:
   1. Tuck point existing mortar joints where indicated and as required by existing conditions.
   2. Tuck point locations of removed hose bibs, address plaques, building equipment, electrical service, conduits, wiring, etc. that were anchored into the mortar joints.

END OF SECTION

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SECTION 04 20 00 - UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes concrete masonry units, clay face brick, stone caps, reinforcement, anchorage, mortar and grout, and accessories.

1.2 SUBMITTALS

A. Product Data: For each type of CMU component, clay face brick, stone caps, mortar / mix design, grout, reinforcement, and accessories.

B. Samples: face brick, in the form of straps of five or more bricks to show full color range.

1.3 PERFORMANCE REQUIREMENTS

A. Concrete Masonry Compressive Strength (f'm): 2,000 psi; determined by unit strength method.

B. Clay masonry Compressive Strength (f'm): 3,000 psi; determined by unit strength method.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 Building Code Requirements for Masonry Structures and ACI 530.1 Specification for Masonry Structures.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Assume responsibility for acceptance of masonry units delivered to Project site being in compliance with specified ASTM requirements for chippage and dimensional tolerances.
   1. Inspect decorative units upon delivery to ensure color match with required materials and accepted mock-up panel.

B. Store masonry units on elevated platforms in a dry location to prevent contamination by mud, dust or materials likely to cause staining or other defects. If units are not stored in an enclosed location, cover tops and sides of stacks with waterproof sheeting, securely tied. If units become wet, do not install until they are dry.
   1. Cover masonry units at all times.

C. Store cementitious materials on elevated platforms, under cover, and in a dry location. Do not use cementitious materials that have become damp.
   1. Deliver cementitious and other packaged materials in unopened containers, plainly marked and labeled with manufacturers' names and brands.
   2. Handle cementitious materials in a manner that will prevent the inclusion of foreign materials and damage by water or dampness.

D. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

E. Store sand on tarps to keep ground water from wicking into sand.

F. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.6 FIELD CONDITIONS

A. Protection of Masonry: During construction, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Temporary measures include application of self-adhered membrane or flashing with long UV exposure. Cover partially completed masonry when construction is not in progress. Continue to cover walls until tie-in to roof is complete and top of wall is protected from water penetration.

B. This structure is designed to be self-supporting and stable after the building is fully completed. Protect masonry walls against wind damage by bracing as required until support of walls is integral with the completed building structure. This includes the addition of whatever temporary bracing, guys, or tie-downs that might be necessary. Safety: It is solely the Contractor's responsibility to follow all applicable safety codes and regulations governing this Work.

C. Provide shoring, bracing, or support to prevent movement, settlement, or collapse of structure, work under demolition, or adjacent work to remain.

D. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
   1. Protect sills, ledges, projections, and adjacent building materials / finishes from mortar droppings.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Cold Weather Requirements: In accordance with ACI 530.1 when ambient temperature or temperature of masonry units is less than 40 degrees F.

B. Hot Weather Requirements: In accordance with ACI 530.1 when ambient temperature is greater than 100 degrees F or ambient temperature is greater than 90 degrees F with wind velocity greater than 8 mph.

C. Patch masonry only when air and surface temperatures are between and 55°f and 100°f and are predicted to remain above 55°f for at least 7 days after completion of work. On days when air temperature is predicted to go above 90°f, schedule patching work to coincide with time that surface being patched will be in shade or during cooler morning hours.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Concrete Masonry Units: ASTM C 90.
   1. Size and Shape: Nominal modular sizes as indicated on Drawings.
      a. Furnish special units for 90 degree corners, bond beams, lintels, jambs, bullnosed corners.
   2. Weight Classification: Normal Weight.
   3. Exposed Faces: Refer to Drawings – smooth face.

B. Face Brick: ASTM C 216, Type FBS, Grade MW, color and texture to match existing brick,
   1. Where shown to "match existing," provide face brick matching color range, texture, and size of existing adjacent brickwork.
   2. Efflorescence: Provide brick that has been tested according to ASTM C 67 and is rated "not effloresced."
   3. Size: Modular, 3-5/8 inches wide by 2-1/4 inches high by 7-5/8 inches long.

C. Precast Concrete sills: fabricated to suit opening, sized as required. Positive slope out to face of wall, extend 1 inch past face of brick.

2.2 LANDSCAPE BLOCKS FOR CRAWL SPACE AREA WELL

A. Snyder Brick and Block, Tumbled Garden Wall, 4 inch high solid blocks, 8 inch depth, 12 inch long, color to be selected by Architect

2.3 MASONRY LINTELS

A. Prefabricated or built-in-place masonry lintels made from specially formed "U" shaped lintel units with reinforcing bars placed as indicated and filled with coarse grout. Open bottom, bond-beam

type units are not acceptable for use as reinforced lintels. Cure prefabricated lintels before handling and installing. Temporarily support built-in-place lintels until cured.

1. Prefabricated lintels shall have a faux head joint pattern on their exposed faces and shall have their top side clearly marked in the factory. Prefabricated lintels are to be installed such that the faux head joint pattern aligns with that of the surrounding masonry.
2. Knockout blocks are not acceptable.

2.4 MORTAR AND GROUT MATERIALS

A. Portland Cement: ASTM C 150, Type I, except Type III may be used for cold-weather construction. Provide natural color or white cement as required to produce mortar color(s) indicated.

B. Hydrated Lime: ASTM C 207, Type S.

C. Portland Cement-Lime Mix: ASTM C 150, Packaged blend of Portland cement, Type I or Type III, and ASTM C 270 hydrated lime, Type S.

D. Mortar Cement: ASTM C 1329.

E. Mortar Pigments: ASTM C 979, Natural and synthetic iron oxides and chromium oxides, compounded for use in mortar mixes.

F. Colored Cement: Packaged blend made from Portland Cement and lime, masonry cement, or mortar cement and mortar pigments, all complying with specified requirements.

G. Aggregate for Mortar: ASTM C 144.

H. Aggregate for Grout: ASTM C 404.
   1. Fine Aggregates: ASTM C 404, clean, sharp, natural sand free from loam, clay lumps, or other substances.
   2. Coarse Aggregates: ASTM C 404, clean uncoated, pea gravel containing no clay, mud, load, or foreign matter. Maximum aggregate size 3/4 inch.

I. Water: ATSM C 1602.

2.5 MORTAR AND GROUT MIXES

General: Match original mortar remnants on brick as determined from field sampling and laboratory analysis at the mortar manufacturers plant. Match for color, texture and compressive strength.

A. Mortar for Unit Masonry: Comply with ASTM C 270, Property Specification. Provide the following types of mortar for applications stated unless another type is indicated or needed to provide required compressive strength of masonry.
   1. For masonry below grade use Type M, where indicated only.
   2. For masonry, use Type S, unless otherwise noted.
   3. For non-load bearing interior partitions, use Type N or S, unless otherwise noted.
   4. For exterior, above-grade, masonry veneer, use Type N or S, unless otherwise noted.

B. Natural [uncolored] Mortar: locations where masonry will be painted.

C. Colored Pigmented Mortar: locations of decorative masonry [non-painted]

D. Grout for Unit Masonry: ASTM C 476.

2.6 REINFORCEMENT

A. Uncoated Steel Reinforcing Bars: ASTM A 615, Grade 60, deformed steel bars.

B. Reinforcing Bar Positioners: Wire units designed to fit into mortar bed joints spanning masonry unit cells with loops for holding reinforcing bars in center of cells.

C. Masonry Joint Reinforcement: ASTM A 951, galvanized welded wire mesh.
   1. W1.7 x W1.7 wire mesh unless noted otherwise on Drawings, located at 16 inches on center vertically

2.7 TIES AND ANCHORS

A. Helical Ties: Simpson Heli-Tie Wall Ties or Equal, size and spacing per drawings.

B. Single Wythe Joint Reinforcement: ASTM A951/A951M; truss or ladder type; steel; 0.148 inch diameter side rods with 0.148 inch diameter cross ties; hot dip galvanized.

C. Wall Ties: Corrugated formed sheet metal, 1” x 7” inch size x 20 gage thick; ASTM A153/A153M hot dip galvanized. Provide fasteners suitable for fastening through insulation board into framing [if applicable].

D. Wire Ties, General: Unless otherwise indicated, size wire ties to extend at least halfway through veneer but with at least 5/8-inch cover on outside face. Outer ends of wires are bent 90 degrees and extend 2 inches parallel to face of veneer.

E. Individual Wire Ties: Rectangular units with closed ends and not less than 4 inches wide.

F. Adjustable Anchors for Connecting to Structural Steel Framing: Provide anchors that allow vertical or horizontal adjustment but resist tension and compression forces perpendicular to plane of wall.

G. Rigid Anchors: Fabricate from steel bars 1-1/2 inches wide by 1/4 inch thick by 24 inches long, with ends turned up 2 inches or with cross pins, unless otherwise indicated.

H. Intersecting Masonry Wall Joint Reinforcing: Where interior masonry walls supported on slabs intersect masonry walls, provide hot dip galvanized 1/2 inch by 16 gauge mesh ties spanning horizontally.

2.8 FLASHING

A. Non-vapor permeable, Self-adhered SBS rubberized asphalt compound laminated to a polyethylene film, specifically designed for thru-wall flashing.
   1. Thickness: 40 mils
   2. Water Vapor Permeance, ASTM E 96: 0.03 perms

2.9 ACCESSORIES

A. Compressible Filler: ASTM D 1056, Premolded filler strips, Grade 2A1; compressible up to 35 percent; of width and thickness indicated; formulated from neoprene or urethane.

B. Preformed Control-Joint Gaskets: ASTM D 2000, styrene-butadiene-rubber compound, or ASTM D 2287, PVC and designed to fit standard sash block and to maintain lateral stability in masonry wall; size and configuration as indicated.

C. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

D. Cellular Plastic Weep / Vent: One-piece, flexible extrusion, UV resistant polypropylene copolymer, full height and width of head joint and depth 1/8 inch less than depth of other wythe.

E. Cavity Mortar Protection Material: Free-draining mesh, made from polymer strands that will not degrade within the wall cavity.

F. Elastomeric Tubing Sealant Backings: ASTM D 1056, Grade 2A1, Neoprene, butyl, EPDM, or silicone tubing, non-absorbent to water and gas. Size and shape for conditions.

G. Crawl Space Vents: Air Vent, Inc. Or Equal :

1. Manual Foundation Vent: 16” x 8”, aluminum construction, manual adjustable sliding damper, mill finish
2. Automatic Foundation Vent: 16” x 8”. Automatic, Heavy duty model ST, honeycomb grill with premium bi-metal coil, automatically opens at 70 degrees, closes at 40 degrees.

H. Masonry Cleaners: Manufacturer's standard strength, general purpose cleaner designed for removing mortar/grout stains, efflorescence, and other new construction stains from masonry surfaces of type indicated below without discoloring or damaging masonry surfaces; expressly approved for intended use by manufacturer of masonry units being cleaned. Do not use products containing hydrochloric (muriatic acid, hydrofluoric acid, or ammonium bifluoride).

I. Water Repellent: Apply manufacturer recommended water repellent / sealer to cast stone.

J. Anchors: Non-corrosive type, sized for conditions, hot dip galvanized steel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive Work.

3.2 PREPARATION

A. Coordinate placement of anchors supplied by other sections.

B. Wet clay and shale brick before laying when initial rate of absorption is greater than 30 grams when tested in accordance with ASTM C67.

3.3 INSTALLATION

A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint thicknesses and for accurate location of openings, movement-type joints, returns, and offsets. Avoid using less-than-half-size units, particularly at corners, jambs, and, where possible, at other locations.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Coursing of Concrete Masonry Units:
1. Bond: Running.
2. Coursing: One unit and one mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

D. Coursing of Brick units:
1. Bond: Running
2. Coursing: Three units and three mortar joint to equal 8 inches.
3. Mortar Joints: Concave.

E. Cut mortar joints flush where ceramic wall tile or other wall covering is scheduled, cement parging is required, resilient base is scheduled.

F. Joint Reinforcement And Anchorage - Single Wythe Masonry:
1. Install horizontal joint reinforcement 16 inches oc. Place joint reinforcement continuous in first joint below top of walls.
2. Place masonry joint reinforcement in first horizontal joint above and below openings. Extend minimum 16 inches each side of opening.
3. Reinforce stack bonded unit joint corners and intersections with strap anchors 16 inches oc.

G. Joint Reinforcement And Anchorage - Masonry Veneer:
1. Install horizontal joint reinforcement 16 inches oc. Place joint reinforcement continuous in first and second joint below top of walls.

2. Place masonry joint reinforcement in first horizontal joint above and below openings.
3. Secure wall ties to stud framed backing and embed into masonry veneer at maximum 16 inches oc vertically and 16 inches oc horizontally.
4. Place wall ties at maximum 8 inches oc vertically within 8 inches of jamb of wall openings.
5. Place wall ties at maximum 8 inches on center horizontally within 8 inches of head and sill of wall openings.

H. Lintels:
1. Install loose steel, bond beams or precast concrete lintels over openings.
2. Install reinforced unit masonry lintels over openings where steel or precast concrete lintels are not scheduled or indicated.
3. Maintain minimum 8 inch bearing on each side of opening.

I. Grouted Components:
1. Reinforce bond beam and pilasters as detailed.
2. Support and secure reinforcing bars from displacement.
3. Place and consolidate grout fill without displacing reinforcing.
4. At bearing locations, fill masonry cores with grout for minimum 12 inches both sides of opening.

J. Masonry Protection: Protect completed masonry and masonry not currently being worked on.

K. Control Joints:
1. Install control joints at the following maximum spacings, unless otherwise indicated on Drawings:
   a. Exterior Walls: 20 feet on center and within 24 inches on one side of each interior and exterior corner.
   b. Interior Walls: 30 feet on center.
   c. At changes in wall height.
2. Do not continue horizontal joint reinforcement through control joints.
3. Form control joint with sheet building paper bond breaker fitted to one side of hollow contour end of block unit. Fill resultant core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
4. Install preformed control joint device in continuous lengths. Seal butt and corner joints.

L. Built-In Work:
1. As work progresses, install built-in metal door frames, window frames, anchor bolts and plates and other items to be built in the work furnished by other sections.
2. Bed anchors of metal door frames in adjacent mortar joints. Fill frame voids solid with grout or mortar. Fill adjacent masonry cores with grout minimum 12 inches from framed openings].

M. Built-in Work: As construction progresses, build in items specified in this and other Sections. Fill in solidly with masonry around built-in items.
1. Install adjustable hollow metal frame anchors, locating anchors on jambs in horizontal bed courses near the top and bottom of each frame and at intermediate points not over 24 inches apart.
2. Unless otherwise noted or thermal break is required, contractor may grout jambs of hollow metal door and window frames in accordance with ANSI 250.8. Where grout is installed during masonry installation, frames shall be braced or fastened in such a way that will prevent the pressure of the grout from deforming the frame members. Grout shall be mixed to provide a 4 inch maximum slump consistency, hand troweled into place. Grout mixed to a thin “pumpable” consistency shall not be used.
3. Rake joints around exterior side of exterior hollow metal door frames for sealant.

4. Protect inside (concealed) faces of door frames in exterior masonry walls, using fibered asphalt emulsion coating. Apply over shop primer approximately 1/8 inch thick and allow to dry before handling.
5. Where hollow metal frames do not wrap around masonry jambs and heads, rub exposed corners of block to remove sharp, irregular edges.
6. Take particular care to embed all conduits and pipes with concrete masonry without fracturing exposed shells and to fit units around switch, receptacle and other boxes set in walls. Where electric conduits, outlets, switch boxes, and similar items occur, grind and cut units before building in services. Prepare cutouts in such a manner that units can be installed plumb and flush.
7. Install anchors, reglets, and nailers for flashing and related work built into masonry work, where indicated.

N. Where built-in items are to be embedded in cores of hollow masonry units, place a grout stop (a layer of metal lath, wire mesh, or plastic mesh) in the joint below and rod mortar or grout into core.

O. Fill cores in hollow concrete masonry units with grout 24 inches under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.

P. Control Joint Locations in CMU: Provide vertical control joints in reinforced CMU where noted on Drawings and in accordance with the National Concrete Masonry Association, specifically at all offsets, returns, openings, and intersections with dissimilar materials and as follows to prevent cracking:

Q. Flashing: Install embedded flashing and weep vents in first course of masonry above ground level, at lintels, ledges, above doors, windows and other openings and under coping and sills, other obstructions to downward flow of water in wall. Flashing shall be installed longitudinally continuous or terminated with end dams. Install vents at shelf angles, ledges, and other obstructions to upward flow of air in cavities. Comply with NCMA recommendations for “drainage wall system” masonry construction.
1. Extend flashings horizontally through outer wythe at foundation walls, above ledge or shelf angles and lintels and turn down on outside face to form drip.
2. Turn flashing up minimum 8 inches and seal to sheathing over wood framed back-up.
3. Lap end joints and seal watertight.
4. Turn flashing, fold, and seal at corners, bends, and interruptions.

R. Weeps: Install weeps in outer wythe at 24 inches oc horizontally above through-wall flashing, at bottom of walls, and other locations where the downward flow of water will be stopped.

S. Cavity Wall: Do not permit mortar to drop or accumulate into cavity air space or to plug weep holes.

T. Cleaning:
1. Remove excess mortar and mortar smears as work progresses.
2. Clean soiled surfaces with cleaning solution.

U. Tolerances:
1. Maximum Variation from Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
2. Maximum Variation from Level Coursing: 1/8 inch in 3 ft and 1/4 inch in 10 ft; 1/2 inch in 30 ft.

END OF SECTION

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SECTION 05 52 00 - METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes steel fabrications and bollards.

1.2 REFERENCES

A. ASTM International:
1. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
2. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
3. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
4. ASTM A501 - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.
5. ASTM A513 - Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing.

B. SSPC: The Society for Protective Coatings:
1. SSPC - Steel Structures Painting Manual.
2. SSPC Paint 20 - Zinc-Rich Coating, Type I - Inorganic and Type II - Organic.

1.3 DESIGN REQUIREMENTS

A. Design handrail, guardrail, and attachments to resist forces as required by Ohio Building Code. Apply loads non-simultaneously to produce maximum stresses.
1. Guard Top Rail and Handrail Concentrated Load: 200 pounds applied at any point in any direction.
2. Guard Top Rail Uniform Load: 50 pounds per linear foot applied in any direction.
3. Intermediate Rails, Panels, and Baluster Concentrated Load: 50 pounds applied to 1 sf area.

1.4 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

B. Samples: Submit samples of components upon request by Architect.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with the following:
1. Structural Steel: AISC 303.
2. High Strength Bolted Connections: RCSC Specification for Structural Joints Using ASTM A 325 or A 490 Bolts.

B. Finish joints in accordance with NOMMA Guideline 1.

1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

PART 2 PRODUCTS

2.1 STRUCTURAL STEEL

A. Channels and Angles: ASTM A36/A36M. 36 ksi.

B. Structural Pipe: ASTM A53/A53M, Grade B.

C. Structural Plates: ASTM A36/A36M. 36 ksi.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. Bolts: Heavy hex, structural type.
   1. ASTM A325; Type 1, hot dipped galvanized, or Type 3, plain.

B. Nuts: ASTM A563 heavy hex type.
   1. Finish: Hot dipped galvanized.

C. Washers: ASTM F436; Type 1, circular. Furnish clipped washers where space limitations require.
   1. Finish: Hot dipped galvanized.

D. Anchor Rods: ASTM F1554; Grade 55, weldable.

E. Threaded Rods: ASTM A36/A36M.
   1. Finish: Hot dipped galvanized.

2.3 WELDING MATERIALS

A. Welding Materials: AWS D1.1; type required for materials being welded.

2.4 FABRICATION

A. Continuously seal joined members by continuous welds. Grind exposed welds smooth.

B. Fabricate connections for bolt, nut, and washer connectors.

C. Fit and shop assemble components in largest practical sizes for delivery to site.

D. Fabricate components with joints tightly fitted and secured. Furnish spigots and sleeves to accommodate site assembly and installation.

E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

F. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

G. Exterior Components: Continuously seal joined pieces by continuous welds. Drill condensate drainage holes at bottom of members at locations not encouraging water intrusion.

H. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

I. Exposed Welded Joints: NOMMA Guideline 1 Joint Finish 2.

J. Accurately form components to suit stairs and landings, to each other and to building structure.

K. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

2.5 FINISHES

A. Prepare structural component surfaces in accordance with SSPC SP 3 or as required by conditions.

B. Shop prime structural steel members.

C. Galvanizing: ASTM A123/A123M; hot dip galvanize after fabrication.

D. Galvanizing for Bolts, Connectors, and Anchors:
   1. Hot-Dipped Galvanizing:
      a. Bolts, Nuts, and Washers: ASTM F2329.
      b. Connectors and Anchors: ASTM A153/A153M.
   2. Mechanical Galvanizing: ASTM B695; Class 50 minimum.

2.6 ACCESSORIES

A. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 5,000 psi at 28 days.

B. Shop Primer: SSPC Paint 15, Type 1, red oxide.

C. Touch-Up Primer: Match shop primer.

D. Touch-Up Primer for Galvanized Surfaces: SSPC Paint 20 Type I Inorganic.

2.7 FINISHES

A. Prepare surfaces in accordance with SSPC SP 1 and requirements of finish coating system.

B. Shop prime items with one coat. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Finish coatings per Section 09 90 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive work.

B. Verify concealed blocking and reinforcement is installed and correctly located to receive wall mounted handrails.

3.2 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete and/or embedded in masonry with setting templates, to appropriate sections.

3.3 ERECTION

A. Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.

B. Field weld components indicated.

C. Do not field cut or alter structural members without approval of Architect/Engineer.

D. After erection, touch up welds and abrasions to match shop finishes.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.5 GROUT INSTALLATION

A. Shim bearing plates and equipment supports to proper elevation, snug tighten anchor bolts.

B. Fill void under bearing surface with grout. Install and pack grout to remove air pockets.

C. Moist cure grout.

D. Remove forms after grout is set. Trim grout edges to from smooth surface, splayed 45 degrees.

E. Tighten anchor bolts after grout has cured for a minimum of 3 days.

3.6 FIELD QUALITY CONTROL

A. Bolted Connections: Inspect in accordance with AISC 303.
   1. Visually inspect all bolted connections.
   2. For Direct Tension Indicators, comply with requirements of ASTM F959. Verify that gaps are less than gaps specified in Table 2.

B. Welding:
   1. Certify welders and conduct inspections and tests as required. Record types and locations of defects found in work. Record work required and performed to correct deficiencies.
   2. Visually inspect all welds.
   3. Ultrasonic Inspection: ASTM E164; perform on all full penetration welds.

C. Correct defective bolted connections and welds.

END OF SECTION

SECTION 05 52 00 – ALUMINUM RAILINGS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pre-finished ornamental aluminum rail systems.

1.2 REFERENCES

A. ANSI A1264.1 - Safety Requirements for Workplace Floor and Wall Openings, Stairs, and Railing Systems.

B. ASTM B 211 - Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, Wire.

C. ASTM B 247 - Standard Specification for Aluminum and Aluminum Die Forgings, Hand Forgings and rolled Ring Forgings.

D. ASTM B 429 - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube.

E. ASTM E 935 - Standard Test Methods for Permanent Metal Railing Systems and Rails for Buildings.

1.3 DESIGN REQUIREMENTS

A. Handrail Standard: ANSI A1264.1

B. Design handrail, guardrail, and attachments to resist forces as required by Ohio Building Code. Apply loads non-simultaneously to produce maximum stresses.
   1. Guard Top Rail and Handrail Concentrated Load: 200 pounds applied at any point in any direction.
   2. Guard Top Rail Uniform Load: 50 pounds per linear foot applied in any direction.
   3. Intermediate Rails, Panels, and Baluster Concentrated Load: 50 pounds applied to 1 sf area.

1.4 SUBMITTALS

A. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

B. Samples: Submit samples of components upon request by Architect.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum [5] years documented experience producing railing systems as specified in this section.

1.6 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication. Take measurements of actual dimensions where necessary for fit without gaps. Provide all required adaptations to provide a complete, finished product.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened, properly labeled, original packaging until ready for installation.

B. Store components to avoid damage from moisture, abrasion, and other construction activities.

C. Keep handling to a minimum. Exercise caution to avoid damage to factory applied finishes.

PART 2 PRODUCTS

2.1 ALUMINUM HANDRAILS, RAILINGS, AND GUARDRAILS

A. Manufacturers: Superior Aluminum Products or Equal

B. Product: Picket Railing Design: Series 9P Aluminum Picket Railing. Railing run between posts which contain machined openings for level applications and mechanical swivel brackets for locations at angles exceeding 10 degrees. Brackets not permitted where standard components are available.
   1. Rail Style A: Single top and bottom rail, two-line railing system
   2. Top Rail: 2 inch x 1 5/8 inch top rail [graspable handrail at steps – run continuous at steps from top to bottom riser]
   3. Bottom Rail: 1 5/8 inch x 1 1/2 inch bottom rail
   4. Square Posts: 2 1/2 inch square
   5. Pickets: 3/4 inch at 4 1/2 inch centers
   6. Rail Height: 36 inch
   7. Base: heavy duty surface mounted base with cover flange over

C. Materials: Rails, Posts, and Pickets formed from 6063-T4, T5, or T6 extruded aluminum alloy

D. Accessories: Cast from aluminum alloy.
   1. Provide all required end caps, closures, returns, etc. for a complete installation.

E. Fasteners: Aluminum or stainless steel.

F. Finish: AAMA 2603, Color as selected by Architect

2.2 FABRICATION

A. Tolerances: Verify dimensions on site prior to shop fabrication for proper connection to building structure or substrate.

B. Components or railing sections shall be fabricated to exact measurements specified through Drawings and field dimensions.

C. Railing sections shall be fabricated at the manufacturing facility in largest practical site delivery sizes.

D. For railings angled horizontally 10 degrees or less, machine to proper angle into the post, for railings angled horizontally 10 degrees or greater use cast swivel brackets to attach to post.

E. Fabricate railing system to meet step railing requirements; riser and tread dimensions of the steps.

F. All posts grouted in concrete to have one nominal 1/4 inch nominal diameter weep hole, 1/2 inch nominal above post collar, in the plane of the rail

G. Provide components required for anchorage of framing. Fabricate anchors and related components of material and finish as required, or as specifically noted.

H. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

2.3 ACCESSORIES

A. Grout: Non-shrink type, pre-mixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing additives, capable of developing minimum compressive strength of 5,000 psi at 28 days.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared. Fully review the supporting structure and substrate to verify a structurally sound base for anchoring railing system.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Ensure that adjacent surfaces, structures, and finishes are protected from damage by construction activities of this section.

C. Use wood blocks and padding to prevent damage to railing members and fittings during erection.

D. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and inline, accurately fitted, free of distortion or defects and securely anchored to building structure and/or substrate.

C. Provide grounds, clips, backing materials, adhesives, brackets, anchors, and accessories necessary for a complete installation.

D. Expansion Bolt Mounting: Anchor through base plates to concrete substrate.

E. Sleeve Mounting:
   1. Arrange for casting of sleeves or core drill concrete to provide holes for railing uprights.
   2. After setting, fill holes with hydraulic grout; brace members until grout is cured.

F. Connect railing components in accordance with manufacturer’s instructions applicable to the specified system.

G. Tighten all fasteners so that completed railing is rigid and free of play at joints and component attachments.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.

B. Maximum Offset From Alignment: 1/4 inch.

C. Maximum Out-of-Position: 1/4 inch.

3.5 GROUT INSTALLATION

A. Shim bearing plates and equipment supports to proper elevation, snug tighten anchor bolts.

B. Fill void under bearing surface with grout. Install and pack grout to remove air pockets.

C. Moist cure grout.

D. Remove forms after grout is set. Trim grout edges to from smooth surface, splayed 45 degrees.

E. Tighten anchor bolts after grout has cured for a minimum of 3 days.

3.6 SCHEDULES

A. Aluminum Railing System: custom fabrication per drawings, located where indicated. Color as selected by Architect.

END OF SECTION

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes structural wall and roof framing, built-up structural members, non-structural interior wall framing, wall and roof sheathing; subfloor sheathing; sill gaskets and flashings; preservative and fire retardant treatment; blocking and related furring and framing materials.

1.2 REFERENCES

A. American National Standards Institute:
   1. ANSI A135.4 - Basic Hardboard.
   2. ANSI A208.1 - Mat-Formed Wood Particleboard.

B. American Wood-Preservers' Association:
   1. AWPA M4 - Standard for the Care of Preservative-Treated Wood Products.
   2. AWPA U1 - Use Category System: User Specification for Treated Wood.

C. ASTM International:
   1. ASTM C1396/C1396M - Standard Specification for Gypsum Board.
   2. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
   3. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials.
   4. ASTM F1667 - Standard Specification for Driven Fasteners: Nails, Spikes, and Staples.

D. Forest Stewardship Council:
   1. FSC Guidelines - Forest Stewardship Council Guidelines.

E. Green Seal:
   1. GS-36 - Aerosol Adhesives.

F. National Lumber Grades Authority:
   1. NLGA - Standard Grading Rules for Canadian Lumber.

G. Northeastern Lumber Manufacturers Association:
   1. NELMA - Standard Grading Rules for Northeastern Lumber.

H. South Coast Air Quality Management District:
   1. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

I. Southern Pine Inspection Bureau:
   1. SPIB - Standard Grading Rules for Southern Pine Lumber.

J. U.S. Department of Commerce National Institute of Standards and Technology:
   1. DOC PS 1 - Construction and Industrial Plywood.
   2. DOC PS 2 - Performance Standard for Wood-Based Structural-Use Panels.
   3. DOC PS 20 - American Softwood Lumber Standard.

K. West Coast Lumber Inspection Bureau:
   1. WCLIB - Standard Grading Rules for West Coast Lumber.

L. Western Wood Products Association:
   1. WWPA G-5 - Western Lumber Grading Rules.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with the following agencies:
   1. Lumber Grading Agency: Certified by DOC PS 20.

2. Wood Structural Panel Grading Agency: Certified by EWA - The Engineered Wood Association.
3. Plywood Grading Agency: Certified by APA.
4. Lumber: DOC PS 20.
5. Wood Structural Panels: DOC PS 1 or DOC PS 2.

B. Perform Work in accordance with Ohio Building Code.

C. Apply label from agency approved by authority having jurisdiction to identify each preservative treated and fire retardant treated material.

PART 2 PRODUCTS

2.1 LUMBER MATERIALS

A. Lumber Grading Rules: SPIB, ASLS.

B. Beam Framing: southern yellow pine species, No. 1 grade, 2” and wider size classification, 19 percent maximum moisture content.

C. Joist Framing: southern yellow pine species, No. 1 grade, 2” and wider size classification, 19 percent maximum moisture content.

D. Columns: southern yellow pine species, No. 2 grade, 4” and wider size classification, 19 percent maximum moisture content.

E. Non-structural Light Framing: Stress Group D, spruce, pine, fir species, 19 percent maximum moisture content.

F. Studding: Stress Group D, spruce, pine, fir species, 19 percent maximum moisture content.

G. Sill Plate: AWPA C2 Lumber, Stress Group D, spruce, pine, and fir species, and 19 percent maximum moisture content, pressure preservative treated.

2.2 SHEATHING MATERIALS

A. Wall Sheathing: ANSI A208.1, Oriented Strand Board [OSB]; wood chips set with waterproof resin binder; unsanded faces; 7/16 inch thickness; 48x96 inch sized sheets

B. Roof Sheathing: ANSI A208.1, Oriented Strand Board [OSB]; wood chips set with waterproof resin binder; unsanded faces; 7/16 inch thickness; 48x96 inch sized sheets [match existing conditions]

C. Subfloor Sheathing: APA Rated Sheathing Structural I, Span Rating 24/16, Exposure Durability 1, unsanded; 3/4 inch thickness; 48x96 inch sized sheets.

2.3 UNDERLAYMENT

A. Plywood Underlayment: Rated Sheathing Structural I, Span Rating 24/16, Exposure Durability 1, sanded; ¼ or ½ inch thickness [conform to flooring installation requirements]; 48x96 inch sized sheets.

B. Cement Board: Refer to Section 09 21 16.

C. Luan Plywood Underlayment: 1/4 inch Thickness, sanded, 48x96 inch sized sheets.

2.4 FIREBLOCKING AND FIRESTOPPING

A. Fireblocking: Solid lumber, structural wood panel, or particleboard.
1. Solid lumber nominal 2 inches thick.
2. Structural wood panel 23/32 inch thick with joints backed by structural wood panel.

B. Draftstopping: Gypsum board or OSB

1. Gypsum board: 1/2 inch thick.
2. OSB: 7/16 inch thick.

2.5 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: ASTM A153/A153M, hot dipped galvanized steel for high humidity and treated wood locations, unfinished steel elsewhere.
   2. Nails and staples: ASTM F1667.

B. Die Stamped Connectors: galvanized steel, specific type/profile as applicable

C. Structural Framing Connectors: Galvanized steel, sized to suit framing conditions.
   1. Simpson or Equal.

D. Anchors: Toggle bolt type for anchorage to hollow masonry. Expansion shield and lag bolt type for anchorage to solid masonry or concrete. Powder actuated fasteners into slab. Hilti or Equal. All anchors sized to suit application and loads.

E. Sill Gasket: Plate width, closed cell foam strip.

F. Sill Flashing: Polyethylene Sheet or Galvanized Steel.

G. Subfloor Glue: ASTM D3498, water base, waterproof.

H. Weather Resistive Barrier / Building Paper: ASTM D226; spun bonded polyethylene, Tyvek or Equal. Coordinate with existing conditions as appropriate.

2.6 WOOD TREATMENT

A. Wood Preservative (Pressure Treatment): AWPA U1, Commodity Specification A-Sawn Products or F-Wood Composites using water-borne preservative with .25 pcf retention.

B. Fire Retardant Treatment: Chemically treated and pressure impregnated, having flame spread of 25 or less when tested in accordance with ASTM E 84 and showing no evidence of significant progressive combustion when test is continued for an additional 20 minute period, Exterior or Interior Type.

C. Moisture Content After Treatment: Kiln dried (KDAT).
   1. Lumber: Maximum 19 percent.
   2. Structural Panels: Maximum 15 percent.

PART 3 EXECUTION

3.1 FRAMING

A. Set structural members level and plumb, in correct position.

B. Fasten framing in accordance with Ohio Building Code.

C. Place horizontal members crown side up.

D. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in alignment until completion of erection and installation of permanent bracing.

E. Provide all required shoring and temporary bracing required to support structure prior to removing any load-bearing components.

F. Construct load bearing framing members full length without splices.

G. Double members at openings. Space short studs over and under opening to stud spacing.

H. Place full width continuous sill flashings under framed walls on cementitious foundations. Lap flashing joint 4 inches.

I. Place sill gasket directly on cementitious foundation. Puncture gasket clean and fit tight to protruding foundation anchor bolts.

J. All exterior framing intended to be left exposed to weather shall be pressure treated and anchored with galvanized fasteners and appropriate connectors.

K. All framing in contact with concrete shall be treated. Interior or exterior walls.

L. Frame new walls, partitions, and openings to suit conditions and as designed.

M. Install solid 2x bearing at each end of beams and headers. Ensure that blocking is positioned with full support/blocking under to existing bearing conditions. Install supplemental blocking as required between joists, framing, etc.

N. Bridge joists at mid-space with solid 2x blocking.

3.2 SHEATHING

A. Install sheathing over framing members in full size sheets in accordance with APA Construction Guide.

B. Fasten sheathing in accordance with Ohio Building Code.

C. Install subfloor sheathing with longer edge perpendicular to floor framing with end joints staggered. Secure sheet edges over firm bearing. Attach sheathing with subfloor glue and appropriate fasteners.

D. Install underlayment in accordance with APA Construction Guide.
   1. 3d x 1 ¼” ring shank nails at 3” at perimeter and 6” in field. **No staples permitted.**
   2. Glue to subfloor as applicable by condition.

E. Secure wall sheathing with ends staggered, over firm bearing.

F. Install new underlayment at areas of wood framed floor systems where required for new finish flooring. Remove all existing underlayment down to original subfloor as required.

G. Place WRB/building paper over wall sheathing, weather lap joints and end laps, staple in place. Coordinate flashing installation to ensure continuous water resistant barrier.

3.3 FIREBLOCKING AND DRAFTSTOPPING

A. Install fireblocking to cut off concealed draft openings as required.
   1. Concealed Framed Wall and Furred Spaces: Install fireblocking vertically at floor and ceiling levels and horizontally.
   2. Connections Between Horizontal and Vertical Spaces: Install fireblocking between vertical walls and partitions and the following:
      a. Horizontal floor and roof framing.
      b. Soffits, dropped ceilings, cove ceilings and other horizontal concealed spaces.

3.4 SITE APPLIED WOOD TREATMENT

A. Treat site sawn cuts. Brush apply one coat of preservative treatment on untreated wood in contact with cementitious materials.

B. Allow preservative to cure prior to erecting members.

3.5 TOLERANCES

A. Framing members: ¼ inch from indicated position, maximum.

END OF SECTION

SECTION 06 20 00 - FINISH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

A. Section includes interior and exterior finish carpentry items, other than shop prefabricated casework; solid surface components, closet rods and shelving, hardware and attachment accessories.

1.2 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, finishes, and accessories.

B. Samples: Submit two samples illustrating wood grain, colors/finishes and profiles.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with AWI Quality Standards, Custom Grade.

B. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

PART 2 PRODUCTS

2.1 EXTERIOR FINISH CARPENTRY

A. Miscellaneous Exterior Trim: Clear pine. 1x and 2x S/P/F or SYP material by widths as indicated on drawings. Aluminum wrap.

B. Exterior Door Trim: 2 inch brickmold [at openings in brick / masonry walls]; 1x4 aluminum wrap trim [match existing width / conditions as appropriate].

C. Shutters: Vinyl Construction, Standard Raised Panel Shutter as manufactured by Mid America Building Components or Equal. As selected from the full range of available colors. Size 15” wide x height of window/opening.

D. Porch Columns / Trim: 1x cedar [WRCLA], clear grade, S4S, width to match conditions, prep for painted finish.

E. Porch Columns: 6 inch square load-bearing fiberglass porch column, Elite TrimWorks or Equal, Complete with base and cap trim, mounting hardware, anchors, etc.

F. Gable End / Faux Louver: Mid America Building Components or Equal. Size per drawings.

G. Refer to Section 07 46 00 for Vinyl Siding and Trim.

2.2 INTERIOR FINISH CARPENTRY

A. Interior Running Trim for Opaque [Painted] finish:
   1. Grade: Custom
   2. Finger jointing: permitted
   3. Species: pine, poplar, or any close grained hardwood lumber. [MDO, MDF, PVC or other composite materials not permitted]

B. Interior Finish Carpentry Components:
   1. Base Trim: 3-1/4 inch colonial or ranch profile [if noted on Drawings]
   2. Shoe mold Trim: 1/2 inch x 3/4 inch shoe mold [if noted on Drawings]
   3. Door / Window Casing Trim: 2-1/4 inch colonial or ranch profile
   4. Window Stool: Solid Surface
   5. Shelving Cleats: 3/4 inch x 3-1/2 inch [1x4] square [if noted on Drawings]
   6. Shelving Cleats at Closet Hanging Rods: 3/4 inch x 5-1/2 inch [1x6] square [if noted on Drawings]

7. Miscellaneous Trim: Size and profile to suit conditions.
8. Interior Handrails: 1-1/2 x 1-3/4 radiused profile [WM 230]
   a. Brackets: Heavy Duty rated, Satin Nickel, space at approximately 48 inches on center [provide blocking in wall as required]
9. Shelving: Paint grade plywood or MDF, sanded, eased leading edge or built up with 1x trim [if noted on Drawings]

C. Plywood: Graded in accordance with AWI Custom veneer with lumber core; birch face species, rotary cut, primed for painted finish.

2.3 INTERIOR FINISH COMPONENTS

A. Plastic Laminate Countertops: Refer to Section 12 35 30.

B. Solid Surface Shower Surround / Lavatory Tops: Refer to Section 06 61 16

C. Solid Surface Window Sills: Solid polymer fabrication: Homogeneous filled acrylic; not coated, laminated or of composite construction meeting ANSI Z124.3 and 6, Type 6. Color as selected from full range of colors included premium colors. As manufactured by Formica, Wilsonart, Hanex, or Equal.
   1. Fabricate for installation at window stools. Minimum of ½" thick with eased edges.
   2. Superficial damage to a depth of .010" shall be repairable by sanding and polishing.

D. Wire Closet Shelving / Closet Rod: open-wire closet shelving system with rod system. ClosetMaid Close Mesh Shelf and Rod or Equal.
   1. 12" shelf depth with hanging rod below
   2. Vinyl coated steel, PVC vinyl thickness 9-11 mills
   3. Support brackets at 36" on center max.
   4. End caps at all open or cut ends.

E. Non-Rated Access Panels [located within individual dwelling units]:
   1. Access panels: sized as required by conditions or equipment requiring servicing.
      a. 1/2 inch thick finish A / C grade plywood, painted.
      b. 2-1/4 inch colonial / ranch profile trim surround, installed to overlap the perimeter of opening.
      c. Screwed into framing.
      d. Plastic access panels secured to framing may be permitted at interior partitions in inaccessible locations [cabinets, closets, etc.] for plumbing access points, etc.
   2. Attic Access Panels: 22 inch x 30 inch opening
      a. 1/2 inch thick finish A / C grade plywood, or gypsum board, painted.
      b. 2-1/4 inch colonial / ranch profile trim surround, installed to overlap the perimeter of opening.

2.4 ACCESSORIES

A. Fasteners and Anchors:
   1. Fasteners: Size and type to suit application, stainless steel for exterior, high humidity and treated wood locations, plain finish elsewhere.
   2. Nails and Staples: ASTM F1667.

B. Contact Adhesives: Water Base type.

C. Wall Adhesive: Cartridge type, compatible with wall substrate, capable of achieving durable bond.

D. Primer: Alkyd primer sealer type.

E. Hardware: as required to suit application.

2.5 FABRICATION

A. Fabricate to AWI Custom standards.

2.6 SHOP FINISHING

A. Sand work smooth and set exposed nails and screws.

B. Apply wood filler in exposed nail and screw indentations.

C. On items to receive transparent finishes, use wood filler matching surrounding surfaces and of types recommended for applied finishes.

D. Stain, seal, and varnish exposed to view surfaces, refer to Section 09 90 00.

E. Seal internal surfaces and semi-concealed surfaces.

F. Seal surfaces in contact with cementitious materials.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

A. Prime paint surfaces of items or assemblies in contact with cementitious materials, before installation.

3.3 INSTALLATION

A. Install work in accordance with AWI Custom quality standard.
   1. Set and secure materials and components in place, plumb and level.
   2. Install trim by nails.
   3. Miter trim and return to wall where applicable.
   4. Install hardware.

B. Preparation For Finish:
   1. Sand work smooth and set exposed fasteners. Apply wood filler in exposed fastener indentations.
   2. Site Finishing: Refer to Section 09 90 00.

END OF SECTION

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SECTION 06 61 16 - SOLID SURFACING FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes cast plastic/solid surface fabrications.

1.2 REFERENCES

A. ASTM International:
   1. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

B. Underwriters Laboratories Inc.:
   1. UL - Fire Resistance Directory.

1.3 SUBMITTALS

A. Shop Drawings: Indicate dimensions, thicknesses, required clearances, tolerances, materials, colors, finishes, fabrication details, field jointing, adjacent construction, methods of support, integration of plumbing components, and anchorages.

B. Product Data: Submit data on specified component products, electrical characteristics and connection requirements.

C. Samples: Submit **two** samples representative of solid surface chips illustrating color, texture, and finish.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit list of approved cleaning materials and procedures required; list of substances harmful to component materials, Include instructions for stain removal, surface and gloss restoration.

1.5 QUALITY ASSURANCE

A. Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum three years documented experience.

1.7 FIELD MEASUREMENTS

A. Verify field measurements prior to fabrication.

1.8 WARRANTY

A. Provide manufacturer’s standard warranty for lavatory sinks, shower/bath wall systems.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Swan Corporation, or Equal.

2.2 COMPONENTS

A. Solid Surface Resin: Homogeneous compression molded material composed of acrylic resins or polyester/acrylic blend, fire-retardant filler materials, fiber reinforcement, and integral coloring agents; stain resistant to domestic chemicals and cleaners; meeting ANSI Z124.3; ASTM E84, ASTM D 570.

1. Construction make up:
    a. Nominal sheet thickness of 0.25”
    b. Nominal countertop thickness of 0.75”
    c. Nominal bathtub/shower wall sheet thickness of 0.225”
    d. Nominal shower base thickness as determined by manufacturer.

B. Color: as selected from ALL manufacturer colors.

C. Polishing Cream: Compatible polishing cream to achieve specified sheen to gel coat.

D. Adhesive: type approved by manufacturer, cartridge dispensed.

2.3 FABRICATION

A. Fabricate components by mold to achieve shape and configuration.

B. Gel coat exposed finish surfaces smooth and polish to low sheen, uniform finish.

C. Radius corners and edges.

D. Provide holes and cutouts for plumbing and bath accessories as indicated on the drawings.

E. Cure components prior to shipment, except sheet materials requiring site handling.

2.4 ACCESSORIES

A. Supply materials for installation of products as specified in manufacturer’s printed instructions including color matched silicone sealant and adhesives where applicable.

B. Supply accessory components as indicated in the schedule in this section.

2.5 SHOP FINISHING

A. Color: color as selected by Architect from full range of standard and premium color options.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions are ready to accept solid surfacing materials.

B. Verify joint preparation and affected dimensions are acceptable.

3.2 PREPARATION

A. Provide anchoring devices for installation.

B. Provide templates and rough-in measurements.

3.3 INSTALLATION

A. Align work plumb and level.

B. Rigidly anchor to substrate to prevent misalignment.

C. Seal to adjacent construction in accordance with appropriate sealant.

3.4 ERECTION TOLERANCES

A. Maximum Variation From Indicated Dimension: **1/8** inch.

B. Maximum Offset From Indicated Position: **1/8** inch.

3.5 CLEANING

A. Clean and polish fabrication surfaces.

3.6 SCHEDULES

A. Lavatory Top: Swanstone Chesapeake Single Bowl Lavatory Top, sized per drawings, 3 1/2 inch backsplash and side splash panel, 1 1/4 inch thick top with eased edges; integral bowl with overflow. Color as selected by Architect.

B. Tub Surround: Swanstone Tub Wall Kit, SS-60-3. Back panel with integral trim, two side panels with integral trim, two corner moldings. Cut / trim to fit as applicable. Color - white
   1. Provide [2] corner soap dishes ES-2 or Equal
   2. Provide Wall Panel Trim Kit around walls as required to accommodate site conditions. Extend Wall Panel Trim along leading edge of tub down to the floor.

C. Accessible Roll In Shower: Swanstone Veritek Performix Trench Drain Shower Base, SBF-3862 shower base. Swanstone Shower Wall Kit, SK-366296. Back panel with integral trim, two side panels with integral trim, two corner moldings. Cut / trim to fit as applicable. Color - white
   1. Provide [1] recessed shelf AS-1075 or Equal
   2. Provide [2] corner soap dishes ES-2 or Equal
   3. Field installed shower accessories – grab bars, seat, etc.

D. Corner Shower: Swanstone Shower Floor: SS-36NEO, 36 inch Neo Angle Corner Shower Base. Swanstone Shower Wall Kit, SS -3672-2, 2 back panels with integral trim, Swanstone Wall Panel Trim Kits, TK -6072, corner molding, Cut / trim to fit as applicable. Color - white
   1. Provide [2] corner soap dishes ES-2 or Equal

END OF SECTION

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SECTION 07 21 13 - BOARD INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: rigid board insulation at foundations.

1.2 SYSTEM DESCRIPTION

A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements in conjunction with other thermal insulating materials.

1.3 SUBMITTALS

A. Product Data: Product characteristics, performance criteria, limitations, adhesives.

B. Manufacturer's Installation Instructions: Submit special environmental conditions required for installation, installation techniques.

C. Manufacturer's Certificate: Products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
   1. Foam Plastic Insulation: Maximum 75/450 flame spread/smoke developed index when tested according to ASTM E84.
   2. Other Insulation: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.

B. Insulation Installed in Exposed Locations Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.
   1. Attic Floor Insulation: Minimum 0.12 watt per sq cm critical radiant flux when tested according to ASTM E970.

C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives when temperature or weather conditions are detrimental to successful installation.

1.6 SEQUENCING

A. Sequence Work to ensure vapor retarder and air barrier materials are in place before beginning Work of this Section.

PART 2 PRODUCTS

2.1 BOARD INSULATION COMPONENTS

A. Extruded Polystyrene Insulation: ASTM C578 Type IV; cellular type, conforming to following:
   1. Board Density: 1.55 lb/cu ft.
   2. Board Zide: 48 x 96 inch.
   3. Board Thickness: 2 inches.
   4. Thermal Resistance: R of 10.0.
   5. Water Absorption: According to ASTM D2842; 0.3 percent by volume maximum.
   6. Compressive Strength: 25 psi.
   7. Board Edges: Square edges.

2.2 ACCESSORIES

A. Adhesive: Type recommended by insulation manufacturer for application.

B. Tape: type as recommended by insulation manufacturer, self-adhering type, 2 inch wide.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate surface is flat, free of honeycomb, fins, irregularities, materials or substances affecting adhesive bond.

3.2 INSTALLATION - FOUNDATION PERIMETER

A. Install boards on wall surface, horizontally. Place surface of insulation against adhesive.

B. Place boards in method to maximize contact bedding. Stagger end joints. Butt edges and ends tight to adjacent board and to protrusions.

C. Cut and fit insulation tight to protrusions or interruptions to insulation plane.

D. Tape insulation board joints.

E. Extend boards over control joints, unbonded to foundation.

END OF SECTION

SECTION 07 21 16 - BLANKET INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Batt insulation in basement, exterior wall, ceiling, and attic / roof construction; batt insulation for filling perimeter window and door shim spaces, crevices in exterior wall and roof.

1.2 SYSTEM DESCRIPTION

A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements in conjunction with thermal insulating materials other sections.

1.3 PERFORMANCE REQUIREMENTS

A. Vapor Retarder Permeance: Maximum 1 perm when tested according to ASTM E96/E96M, water method.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product data including thermal performance of materials. Provide recycled content and emissions information as part of the product data.

1.5 QUALITY ASSURANCE

A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
   1. Batt Insulation: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.

B. Insulation Installed in Exposed Locations Surface Burning Characteristics: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.
   1. Attic Floor Insulation: Minimum 0.12 watt per sq cm critical radiant flux when tested according to ASTM E970.

PART 2 PRODUCTS

2.1 BATT INSULATION

A. Manufacturers:
   1. Certainteed.
   2. Johns Manville.
   3. Owens-Corning Fiberglass.
   4. Dow Building Products

2.2 COMPONENTS

A. Batt Insulation [interior face of basement foundation walls]: ASTM C665; basement blanket insulation, conforming to the following:
   1. Thermal Resistance: R of 11.
   2. Blanket Width: 48 inches
   3. Facing: Perforated reinforced polyropoylene or foil facing with flanges for staple attachment.

B. Batt Insulation [exterior wall assemblies]: ASTM C665; preformed glass fiber batt; friction fit, conforming to following:
   1. Thermal Resistance: R of 15 [2x4 wall framing] or R of 21 [2x6 wall framing].
   2. Sized to fit rough framing members / stud spacing.
   3. Facing: Faced on one side with asphalt treated mesh reinforced kraft paper.

C. Batt Insulation [floor-ceiling assemblies above non-conditioned space / outside air]: ASTM C665; preformed glass fiber batt; friction fit, conforming to following:
   1. Thermal Resistance: R of 30.
   2. Sized to fit rough framing members / joist / truss spacing.
   3. Facing: Unfaced.

D. Batt Insulation [attic assemblies above conditioned spaces where not to receive blown in attic insulation]: ASTM C665; preformed glass fiber batt; friction fit, conforming to following:
   1. Thermal Resistance: R of 38.
   2. Sized to fit rough framing members / joist / truss spacing.
   3. Facing: Unfaced.

E. Staples: type and size to suit application.

F. Tape: Polyester self-adhering type, mesh reinforced, 2 inch wide.

G. Insulation Fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

H. Wire Mesh: Galvanized steel, hexagonal wire mesh.

2.3 ACCESSORIES

A. Exterior Walls, Sill Seal Insulation: Poly foam sill seal gasket, 3-1/2” or 5-1/2” wide roll type installation [match dimension of wall framing]. Owens Corning Foam SealR or Equal.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install in exterior walls, floor-ceiling assemblies, and roof / attic spaces without gaps or voids. Do not compress insulation.

B. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

C. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within plane of insulation.

D. Install with factory-applied vapor retarder membrane facing warm side of building spaces. Lap ends and side flanges of membrane over framing members.

E. Staple facing flanges in place at maximum 6 inches o.c.

F. Retain in place with spindle fasteners or wire mesh if required by conditions at unfaced insulation locations.

G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

3.2 SCHEDULES

A. Basement Foundation Wall Insulation: R-11 fiberglass blankets, perforated faced, extend full height of wall

B. Exterior Wall Sill Seal Insulation: 1/4” thick foam roll under bottom plate.

C. Exterior Stud Wall Insulation:
   1. 2x4 wall framing: R-15 fiberglass batt, kraft faced, friction fit.
   2. 2x6 wall framing: R-21 fiberglass batt, kraft faced, friction fit

D. Floor-Ceiling Insulation: R-30 fiberglass batt, unfaced, friction fit.

E. Attic Insulation [at locations not receiving blown-in attic insulation]: R-38 fiberglass batt, unfaced, friction fit.

END OF SECTION

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SECTION 07 21 19 - FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Foamed-in-place insulation at exterior wall crevices requiring thermal seal; and foamed-in-place insulation at junctions of dissimilar wall and roof materials to achieve thermal and air seal.

1.2 PERFORMANCE REQUIREMENTS

A. Conform to applicable code for flame and smoke, concealment, and over coat requirements.

1.3 SUBMITTALS

A. Product Data: Product description, insulation properties, preparation requirements, and overcoat properties.

B. Manufacturer's Installation Instructions: Special procedures, perimeter conditions requiring special attention.

1.4 QUALITY ASSURANCE

A. Insulation Installed in Concealed Locations Surface Burning Characteristics:
   1. Foam Plastic Insulation: Maximum 75/450 flame spread/smoke developed index when tested according to ASTM E84.
   2. Overcoat: Maximum 75/450 flame spread/smoke developed index when tested according to ASTM E84.

B. Apply label from agency approved by authority having jurisdiction to identify each foam plastic component.

C. Installer: Company specializing in performing Work of this Section with three years' experience.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not install insulation when ambient temperature is lower than 70 degrees F.

PART 2 PRODUCTS

2.1 FOAMED-IN-PLACE INSULATION

A. Insulation: ASTM C1029, Type II, two component, closed-cell spray polyurethane.
   1. R-value: ASTM C 518, 6.5 per inch.
   2. Air Leakage Rate, ASTM E2178: Less than 0.004 cfm per sq ft at 1 inch.

2.2 ACCESSORIES

A. Primer: As required by insulation manufacturer.

B. Overcoat: Cementitious type, spray applied.

PART 3 EXECUTION

3.1 PREPARATION

A. Mask and protect adjacent surfaces from over spray or dusting.

B. Apply primer as applicable to the conditions.

3.2 INSTALLATION

A. Expanding polyurethane insulating foam insulation/sealant:

1. Clean surfaces from debris, dust, and dirt.
2. Spray in place using care not to apply to adjacent surfaces.
3. Trim back flush or slightly behind finish surfaces.

B. Apply insulation by spray method, to uniform monolithic density without voids.

C. Apply to fill voids, cracks, or intersections of building materials.

D. Apply overcoat to uniform minimum thickness where required to achieve fire rating required.

3.3 SCHEDULES

A. Gaps/Cracks in floor slab around openings for bathtubs, piping, etc. and around perimeter of building foundation where wall meets slab: Fill gap or crack with expanding polyurethane foam sealant.

B. Miscellaneous gaps and cracks in building envelope: Fill gaps with expanding foam sealant where applicable such as gaps at window and door openings, etc. Install minimal expansion foam at all locations where sealant may bow or warp materials.

C. Install at all joints of stud/plate, sheathing, penetration of wiring into stud cavity top/bottom plates, into box/cable penetrations, around openings and other cracks/joints in building envelope. Install at all interior partitions at wiring, etc. through top/bottom plates.

D. Install at all penetrations of ductwork, conduits, etc. through the floor, walls or ceiling. Cap all chases with a rigid air barrier as applicable for the condition. Seal all HVAC boots, electrical boxes, etc. to the gypsum board finishes.

E. Install at backside of all stud cavity bays at joint between each wood stud and face of exterior sheathing.

F. Fill all cavities at framed building corners, etc. with foam sealant. Refer to drawings for framing details.

END OF SECTION

SECTION 07 21 26 - BLOWN INSULATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: pneumatically placed fiberglass attic insulation.

1.2 SYSTEM DESCRIPTION

A. Materials of This Section: Provide continuity of thermal barrier at building enclosure elements.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer's product data including thermal performance of materials. Provide recycled content and emissions information as part of the product data.

1.4 QUALITY ASSURANCE

A. Insulation Installed in Exposed Locations Surface Burning Characteristics:
   1. Other Loose Fill Insulation: Maximum 25/450 flame spread/smoke developed index when tested according to ASTM E84.
   2. Attic Floor Insulation: Minimum 0.11 Btu per sec per sq ft critical radiant flux when tested according to ASTM E970.

PART 2 PRODUCTS

2.1 BLOWN INSULATION

A. Manufacturers:
   1. Certainteed.
   2. Johns Manville.
   3. Owens-Corning Fiberglass.

2.2 COMPONENTS

A. Fiber Fill Insulation: ASTM C764, glass fiber type, bulk for pneumatic placement.

B. Ventilation Baffles: Formed rigid fiberboard or cardboard used with fiber fill insulation, sized to fit between roof framing members to permit cross ventilation of attic and eave. Provide complete vertical return down to meet top of top plate at wall framing. Length as required by conditions and provide clear ventilation path to ridge.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify light fixtures have thermal cut-out device to restrict over-heating in soffit or ceiling spaces.

B. Verify spaces are unobstructed to allow placement of insulation.

3.2 INSTALLATION

A. Place insulation pneumatically in attic spaces.

B. Place insulation against baffles. Do not impede natural attic ventilation to soffit.

C. Place against and behind mechanical and electrical services within plane of insulation.

3.3 SCHEDULES

A. Attic Spaces: R-49 blown in fiberglass insulation.

END OF SECTION

SECTIONS 07 31 13 - SHINGLES AND ACCESSORIES

PART 1 GENERAL

1.1 WORK INCLUDES, BUT NOT LIMITED TO:

General: Provide a functional 50-year new water-resistant shingle system, resisting wind uplift pressures, thermally induced movement and exposure to weather without failure. Roof system must have been tested and approved [industry standard test] and have field experience by the manufacturer.

A. Removal of existing shingles / underlayment and related items.

B. Repair of existing wood roof decks / sheathing as applicable to the conditions.

C. Installation of shingle roof system.

D. Installation of associated ice and water shield membrane and synthetic underlayment.

E. Installation of vents, pipe boots and accessories.

1.2 APPLICABLE REFERENCES

A. The following references form a part of this specification.
1. ASTM D3462 Asphalt Shingles, Fiberglass, Class A, Mineral surfaced
2. ASTM D1970 Rubberized Asphalt Membrane.
3. ASTM B209 Aluminum.
4. ASTM E 108 Fire Test of Roof Coverings
5. [SMACNA] Sheet Metal and Air Conditioning Contractors Association- 6th Edition or Current Manual
6. [OSHA] Occupational Safety and Health Administration, Guidelines
7. ANSI/SPRI WD-1 Wind Design Standards
8. CertainTeed, Shingle Applicators Manual [Current Edition].
9. ASTM D3161 Wind Testing for Steep Sloped Roofing.
10. ASTM D226/D4869 Underlayment.
11. ASTM D7158 H, Wind Rating for Asphalt Shingles

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Steep Roofing Manual.

1.4 PRECAUTIONS

A. Do not install shingles or roofing when the temperature is below 45 degrees F or during inclement weather, including drizzle, rain, and/or snow. Do not install underlayment or shingles over wet deck / underlayment. Follow manufacturer's requirements for installation of underlayment and shingles for all environmental conditions.

B. Do not overload the structure with storage of materials or equipment.

1.5 SEQUENCING/SCHEDULING AND PROTECTION

A. **Provide overhead protection for Construction Crews, etc from falling materials / debris at building entry points and other hazard locations.**

B. Coordinate the work of installing all associated items in such sequence that will not necessitate movement of workers and equipment over completed roof areas.

C. Sequence work so that all underlayment, flashing, etc. is installed to produce a watertight condition as work progresses.

D. Protect building surfaces / interior spaces against damage from roofing work.

E. Take all actions and provide all appropriate temporary weather seals, tarps, etc. to prevent construction-related leaks.

F. Provide, erect barricades, guardrails as required by applicable regulatory advisory to protect occupants of building and workers.

1.6 MANUFACTURER'S WARRANTY

A. Provide a manufacturer's warranty for both repairs / replacements due to any faults in the material and workmanship [Total System Responsibility]. Any leak repairs / replacement due to normal wear and tear, membrane defects, workmanship defects, damage due to wind speeds as noted [10 meters above ground], shall be performed at no charge to the Owner through the period of the warranty.
   1. Shingles: Furnish a 15 year,110 miles per hour wind warranty, 15-year algae resistance warranty, [50] fifty-year manufacturer's defects warranty with a prorated 10-year labor and material replacement warranty.
   2. Protective Membrane: Furnish a [30] thirty year prorated waterproof warranty.
   3. Vents: Lifetime warranty.

1.7 MEETINGS/COORDINATION

A. Schedule a pre-installation conference one week prior to commencing work of this section. All parties responsible for work in this section are required to attend.

PART 2 PRODUCTS

2.1 ASPHALT SHINGLES

A. ASTM D 3462, CertainTeed SAINT-GOBAIN, Landmark PRO [Basis of Design], Dimensional, two-piece laminated fiber glass construction, UL class A rating, 240 -267 pounds per square, self-sealing type, class F, algae resistance, wind rated and a manufacturers defects and replacement warranty.
   1. Color: Architect / Owner will select shingle color from full range of shingle colors.
      a. All shingles shall be from the same dye lot. Provide documentation.

2.2 FASTENERS

A. General: Fasteners/Anchors: strength, type and configuration must meet the required pull test resistance for each attachment application. Fasteners rate and pattern must be FMG, Ohio Building Code / Residential Code of Ohio requirements, manufacturer requirements to meet the intent of the wind uplift rating specified.

B. Determine / confirm fastener lengths required for the installation:
   1. Minimum embedment requirements:
      a. Steel: 3/4 inch
      b. Concrete/concrete block: 1-1/4 inch
      c. Gypsum Decking: 2 inches
      d. Wood blocking: 1-1/4 inch
      e. Wood Decking: 3/4 inch.

C. Provide corrosion resistant steel fasteners in accordance with ASTM F1667 [2015].

2.3 ACCESSORIES

A. Cap Nails for Underlayment: Simplex, Plex-Cap, length as required to penetration wood decking 3/4 inch.

B. Nails for shingles: Round wire type, corrosion resistant, 3/8-inch minimum diameter head, 11- or 12-gauge shank, length as required to penetration wood decking 3/4 inch [use longer nails for attachment of ridge vent, when required].

C. Ridge Vents: CertainTeed filtered ridge vent, shingle-over vent, 9 Inches or 12 inches wide, polypropylene construction, internal baffles to deflect wind and drainage system, weep holes, minimum 9 square inches of net free venting per linear foot, color black.

D. Box Vents [static vents]: Lomanco, 750 series, nailing flange at roof deck; slant back, weather tight seamed collar, pre-finished aluminum, minimum 50 square inches of net free area per vent. Color to closely match shingle color. Cut hole in roof deck where required / new box vent locations.

E. Intake Vents: CertainTeed intake filtered edge vent, shingle-over intake, polypropylene construction, internal baffles and drainage system along with weather filter, 9 square inches of net free venting per linear feet, color black.

F. Fascia Vents: DCI products, 'FASCIAVENT', 9 square inches of net free venting per linear feet or equal.

G. Pipe Boots: Manning Building Products 'Perma-boot or Protech Specialty Products , pipe boot.

H. Plastic Cement: ASTM D4586, Asphalt type with mineral fiber components, free of toxic solvents, capable of setting within 24 hours at temperatures of 75 degrees F and 50 percent RH.

I. Lap Cement: Fibrated cutback asphalt type, recommended for use in application of underlayment, free of toxic solvents.

J. Flashing Materials:
   1. Sheet Flashings: As specified in Section 07 62 00.
   2. Gutters and Downspouts: As specified on Section 07 71 23.

K. Base Flashing: 24 gauge galvanized steel, 4 inch roof / vertical flange, 7 inch long.

2.4 SHINGLE UNDERLAYMENT/RUBBERIZED ASPHALT PROTECTIVE MEMBRANE

A. Ice and Water Shield: ASTM D 1970, Certainteed WinterGuard or Equal, 40 mil thick self-adhering membrane with strippable release paper, homogeneous rubberized asphalt waterproofing compound, fiberglass reinforced, skid resistant sand / granular surface, self sealing

B. Synthetic Underlayment: ASTM D-828; Synthetic high strength woven roof underlayment; 100% polypropylene fabrication; CertainTeed Roof Runner or Equal.
   1. Install and secure using the pre-printed nailing pattern for increased wind resistance.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify all existing and newly replaced wood decks are level and smooth after existing roof system, underlayment, and deteriorated decking is removed. Verify deck surfaces are dry, free of ridges, warps, or voids.

B. Remove and replace deteriorated wood decking where required [contingency allowance].
   1. If existing roof is found to be skip sheathed / gapped, new roof sheathing will be required [contingency allowance]

C. Verify roof penetrations and plumbing stacks are in place and flashed to deck surface.

D. Verify roof openings are correctly framed.

3.2 PREPARATION

A. Fill knot holes and surface cracks with latex filler at areas of eave and valley protection membrane. Cover knot holes with sheet metal.

B. Broom clean deck surfaces prior to application of ice and water shield and underlayment.

C. Ensure penetrations are correctly framed.

D. Fill all holes in areas where eave/valley protection [ice and water shield] is being installed.

E. Replace any deteriorated wood decking.

3.3 SHINGLE UNDERLAYMENT AND ICE AND WATER SHIELD MEMBRANE

A. Ice and Water Shield Membrane Installation:
   1. Install ice and water shield membrane parallel with eave edge, flush with face of eave edge flashing with edges lapped shingle style and ends lapped and staggered between rows. Unroll underlayment parallel to the eave. Install over the drip edge at the eave flashing and under the rake edge flashing. Install underlayment in accordance with manufacturer's instructions without distortions capable of preventing shingles from sealing.
   2. Weather lap joints minimum 2 inches at side laps and 6 inches at end laps.
   3. Secure underlayment in place with fasteners at the perimeter of the roll and in field of roll per manufacturer installation instructions.
   4. Install self-adhered protective ice and water shield membrane / underlayment at the following areas / conditions with careful detailing:
      a. Eaves [minimum of 1 full sheet, but a minimum of 24 inches past interior face of exterior wall]
      b. Intersections of roof-wall [1/2 sheet]
      c. Rake / Roof Edges [1 full sheet]
      d. Valleys [1 full sheet centered in valley, extending full length of valley].
      e. Roof Penetrations [center underlayment around opening]

B. Synthetic Underlayment Installation:
   1. Install synthetic underlayment parallel to the eave edge with edges lapped shingle style and ends lapped and staggered between rows. Install underlayment in accordance with manufacturer's instructions without distortions capable of preventing shingles from sealing.
   2. Weather lap joints a minimum of 3 inches at side laps and 6 inches at end laps.
   3. Weather lap and seal items projecting through or mounted on roof watertight with plastic cement.
   4. Secure underlayment in place with fasteners at the perimeter of the roll and in field of roll per manufacturer installation instructions.
   5. Install synthetic roof underlayment at all roof areas which do not receive ice and water shield.

C. Synthetic Underlayment Installation for roof slopes between 2:12 and 4:12
   1. Install [2] layer application in accordance with the manufacturer's installation instructions for low slope applications.

3.4 ACCESSORIES INSTALLATION

General, all accessories shall be installed in accordance with manufacturer's written guidelines with installation summary as outlined herein.

A. Ridge Vents shall be installed on ridges as where shown. After the underlayment is installed. Cut roof deck on both sides of the ridge. Center ridge vent over opening and nail in place. Install ridge shingles with nails long enough to penetrate the deck 1 inch.

B. Intake Vents shall be installed on the lower section of the roof just above the eaves as shown. After the underlayment is installed, cut a slot thru the decking to allow for the venting. Center the vent over the opening and nail in place. Install new underlayment over the vent, over the underlayment install the starter shingles. Nail pattern may be deviated to avoid nailing into the slot.

C. Static Box Vents to be located as shown and evenly spaced. Center the vent between rafters and approx. 24 inches down from the ridge. Saw out the deck where the vent is being installed. If the shingles have been installed, remove the nails so the flashing flange of the vent will slide under the shingles with the embossed arrow pointing up centered over opening. Once the throat of the vent is aligned, apply roof cement to the bottom of the vent. Seven nails are required to fasten the vent keeping the nail heads under shingles where possible or applying roof cement to exposed nail heads in accordance with manufacturer's recommendations.

D. Metal Flashing and Accessories Installation:
   1. Flashings shall be provided at the intersection of the roofs, adjoining walls, or projections through the deck.
   2. Shingle base flashing shall be installed in accordance with SMACNA Fig. 4-22A recommendations.
   3. Counter-flashing shall be surface mounted attached with wood fasteners as applicable fitted with EPDM washer at 12 inches on center with minimum of 1 inch embedment. Apply bead of sealant on the top of the flashing. Counter flashing shall overlap base flashing sheet metal a minimum of 3 inches and shall terminate no lower than 4 inches above the finished roof surface, unless approved by the manufacturer.
   4. Weather lap joints minimum 2 inches and seal weather tight with plastic cement.
   5. Secure in place with nails. Conceal fastenings.
   6. Flash and seal Work weather tight, projecting through or mounted on roofing with plastic cement.

3.5 SHINGLE APPLICATION

General, all shingles shall be installed in accordance with manufacturer's written guidelines**.**

A. Apply starter strips at eaves. Starter strips shall consist of one layer of strip shingles laid with cutouts reversed. Project strip 1/2 inch beyond eaves line to form a drip overlap. Fasten strip in place within row of nails 1 inch above lower edge and spaced 3 inches on center. Lay first course of shingles directly on top of starter strip, flush with drip edge. Succeeding courses shall have chalk lines snapped as required for proper alignment. Nail 1 inch from each end of the shingle and 12 inches from each end, **6 nails per shingle.** All 6 nails must be placed on a white line 5-5/8 above the butt edge of the shingle. A cutout must never overlap another cutout in the below course. Firmly press each tab into the factory applied sealant. If the sealant appears not to be adhering the shingle apply new sealant.

B. Ridges shall be 3-tab shingles cut in three sections or ridge shingles. Bend shingle at center, nail in place using 2 nails each located 4-1/2 inches from the exposed butt end and 1 inch from the side edge. Place to avoid exposed nails, all exposed nails shall have roof cement applied over nail heads. Use nails long enough to penetrate thru both layers of shingles and into wood ¾ inch. Shingles installed over ridge vents shall have nails long enough to penetrate shingle all layers and into decking 1 inch.

C. Valleys shall be the closed cut type [no metal], Install full length [course] shingles 12 inches beyond the valley center, nail shingles in place avoiding nails 6 inches from the center of valley. Chalk a line in the valley center, then cut shingles along chalk line using a sheet metal under shingles avoiding cut thru shingles below. Trim corners of each shingles at a 45-degree angle and apply sealant under shingles on both sides of the valley and any other area requiring sealant. Follow printed manufacturers installation instructions.

3.6 CLEAN UP

A. Clean up all debris resulting from each day's work.

END OF SECTION

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SECTION 07 46 00 – VINYL SIDING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes vinyl lap siding, soffits, composite trim, flashings, accessories, and fastenings.

1.2 SUBMITTALS

A. Product Data: Submit data indicating materials, component profiles, fastening methods, jointing details, sizes, surface texture, finishes, and accessories.

B. Samples: Submit two samples illustrating surface texture and color.

1.3 PERFORMANCE REQUIREMENTS

A. PVC Fire Resistance: Provide vinyl siding products that meet or exceed the following ratings:
   1. Flame spread index 20, fuel contribution 0, smoke development rating 360, per ASTM E 84.
   2. Self-ignition temperature: 824 degrees F per ASTM D 1929.
   3. Fire endurance classification of 1 hour, per ASTM E 119 as wall assembly.

B. Siding: TPO Fire Resistance: Provide thermoplastic polyolefin siding products that meet or exceed the following ratings:
   1. Minimum self-ignition temperature of 650 degrees F per ASTM D 1929.
   2. Smoke density rating of 40, per ASTM D 2843.

1.4 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.5 WARRANTY

A. Furnish lifetime limited manufacturer warranty for prefinished siding products.

PART 2 PRODUCTS

2.1 SIDING

A. General: Match existing siding profile and color. Field verify conditions.

B. Manufacturers:
   1. Certainteed, Siding Products Group, Restoration Classic [basis of design]
   2. Crane Performance Siding
   3. Alcoa Building Products.
   4. Mastic Home Exteriors

C. Product Description: Furnish vinyl lap siding and trim components.

2.2 COMPONENTS

A. Vinyl Siding Components: Extruded polyvinyl chloride; comply with requirements of ASTM D3679.
   1. Provide elongated nailing slots on nailing flanges to allow for movement.
   2. Factory-notch ends of horizontal panels to form overlapping joints.
   3. Provide products that meet weathering requirements of ASTM D3679.

2.3 VINYL LAP SIDING

A. Double 4-1/2” Dutchlap Siding, Certainteed Restoration Classic

1. Design: Double 4-1/2 inches
2. Projection: 5/8 inch.
3. Finish: Cedargrain
4. Length: 12 feet
5. Average Thickness: 0.044 inch.

B. Double 5” Clapboard Siding, Certainteed Restoration Classic
1. Design: Double 5 inches
2. Projection: 5/8 inch.
3. Finish: Cedargrain
4. Length: 12 feet
5. Average Thickness: 0.044 inch.

2.4 VINYL SOFFITS

A. Soffits: Polyvinyl Chloride: PVC compound with cell classification of 13344-B, as defined by ASTM D 4216, meeting or exceeding the following properties:
1. Provide elongated nailing slots on nailing flanges to allow for movement.
2. Factory-notch ends of horizontal panels to form overlapping joints.
3. Provide products that meet weathering requirements of ASTM D 4477.

B. Triple 4” soffit, fully vented, Certainteed Universal Triple 4”
1. Design: Triple 4 inches fully vented.
2. Width: 12 inches plus or minus .062 inch.
3. Length: 12 feet plus or minus) .025 inch.
4. Average Thickness: 0.040 inch.
5. Exposure: 12 inches single nailing hem.
6. Panel Projection: 1/2 inch.
7. Maximum Warp (per 2 panels): 0.250 inch.
8. Ventilation: 10.0 sq. inches per sq. ft.

C. Soffit Accessories:
1. J-Channel: 3/8 inch (10 mm) by 12 feet, 6 inch length, for vertical and eave applications.
2. F-Channel: 5/8 inch (15.88 mm) and 3/4 inch by 12 feet 6 inches (3.81 m) length.
3. Soffit Double Channel Lineal: 3/8 inch or 1/2 inch by 12 feet, 6 inches length, for eave applications.
4. Soffit Cove Trim: 1/2 inch by 12 feet, 6 inches length.
5. Color: Match soffit color.

2.5 ACCESSORIES

A. Provide all related accessories, trim, etc. for a complete installation.

B. Nails: Hot dipped galvanized type, non-staining, for concealed installation.
1. Vinyl Siding Nails: Minimum 0.313 inch diameter head and 0.125 inch shank diameter; length required to penetrate support minimum 0.75 inch.

C. Building Paper: Spun bonded polyolefin sheeting, Tyvek or Equal.

D. Flashings: 26 gauge thick metal to match siding.

E. Accessory Components:
1. Vinyl starter strips, J-mold, F-mold, interior and exterior corner posts, and related trim profiles; of same material and finish as siding/soffits.

PART 3 EXECUTION

3.1 PREPARATION

A. Verify framing conditions are within allowable tolerances without twists, bows, waves, etc.

3.2 INSTALLATION

A. Install vinyl siding in accordance with ASTM D4756 and manufacturer's instructions.

B. Install all required supplemental blocking and furring as required to allow installation as scheduled.

C. Nail vinyl siding into solid backing per manufacturer's requirements.
   1. Nail to aligned pattern.

D. Align level, and plumb.

E. Install metal flashings at areas required by siding manufacturer.

F. Install corner strips, closures, trim.

G. Install sealant as applicable to prevent weather penetration. Maintain neat appearance.

H. Install flashing around openings, etc.

END OF SECTION

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SECTION 07 62 00 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

A. Section includes flashings and counterflashings and fabricated sheet metal items.

1.2 SYSTEM DESCRIPTION

A. Sheet Metal System: Conform to criteria of [SMACNA "Architectural Sheet Metal Manual."]

1.3 SUBMITTALS

A. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, termination, and installation details.

1.4 WARRANTY

A. Furnish lifetime limited year manufacturer warranty for finishes.

PART 2 PRODUCTS

2.1 SHEET METAL FLASHING AND TRIM

A. Pre-Finished Aluminum Sheet: ASTM B209; 3003 alloy, H14 temper; mill finish shop pre-coated with acrylic color as selected from manufacturer's standard.
   1. 20 gauge [0.032 inch thick] cladding / flashings where intended to be left exposed [including all fascia and rake, trim cladding, etc].
   2. 24 gauge [0.020 inch thick] or 26 gauge [0.016 inch thick] flashings at starter strips, concealed flashings, etc.

B. Pre-Finished Galvanized Steel Sheet: ASTM A755/A755M; grade A; structural steel sheet, G90 (Z275) zinc coating; 24 gauge steel, shop pre-coated with two coat fluoropolymer top coat [Kynar 500, 70% formulation]; color as selected from full range of manufacturer's standard colors.

2.2 ACCESSORIES

A. Fasteners: Same material and finish as flashing metal, with soft neoprene washers as required to suit conditions.

B. Underlayment: ASTM D226; Type I, No. 15 unperforated asphalt felt.

C. Protective Backing Paint: Bituminous.

D. Slip Sheet: Rosin sized building paper.

E. Sealant: Exterior metal lap joint butyl or polyisobutylene sealant as specified in Section 07 90 00.

F. Plastic Cement: ASTM D4586, Type I.

G. Reglets: As required to suit conditions.

H. Primer and Solvent for Polyvinyl Chloride (PVC): As recommended by manufacturer.

2.3 FABRICATION

A. Form components to shape indicated on Drawings, accurate in size, square, and free from distortion or defects. Form pieces in longest practical lengths.

B. Fabricate cleats and starter strips of same material as sheet, to interlock with sheet.

C. Hem exposed edges on underside 1/2 inch; miter and seam corners. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

D. Fabricate flashings to allow toe to extend 2 inches over roofing. Return and brake edges.

E. Form material with flat lock seams, except where otherwise indicated. At moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

F. Fabricate corners in one piece, 18 inch long legs; seam for rigidity, seal with sealant.

2.4 SHOP FINISHING

A. Acrylic coating: Baked enamel system conforming to AAMA 2603.

B. PVDF (polyvinylidene fluoride) coating: Multiple coats, thermally cured, fluoropolymer system conforming to AAMA 2604 or AAMA 2605. (KYNAR 500)

C. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mil.

3.3 INSTALLATION

A. Install starter and edge strips, and cleats.

B. Install surface mounted reglets. Seal top of reglets with sealant. Insert flashings to form tight fit. Seal flashings into reglets with sealant.

C. Secure flashings, gutters and downspouts in place using [concealed] fasteners.

D. Install cladding over existing / new wood substrate. Brake form to profiles required in the longest lengths practical. Hang to minimize oil canning and other unintended movement / twisting, etc. Allow for expansion and contraction.

E. Apply plastic cement compound between metal work and felt flashings.

F. Fit components tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

G. Seal joints watertight.

END OF SECTION

SECTION 07 71 23 - GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pre-finished aluminum gutters and downspouts.
   1. Provide cast concrete splash blocks where no underground storm piping exists.
   2. Provide PVC Boot with cleanout to connect to underground storm piping where indicated.

1.2 REFERENCES

A. American Architectural Manufacturers Association:
   1. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels.
   2. AAMA 2604 - Voluntary specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels.
   3. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels.

B. Sheet Metal and Air Conditioning Contractors:
   1. SMACNA - Architectural Sheet Metal Manual

1.3 DESIGN REQUIREMENTS

A. Gutter and Downspout Components: Conform to applicable code for size and method of rainwater discharge for a once in 10 year rainfall.

1.4 SUBMITTALS

A. Product Data: Submit data on manufactured components, materials, and finishes.

B. Samples: Submit two sets of manufacturer color samples illustrating component colors.

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with SMACNA Manual.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope to drain.

B. Prevent contact with materials during storage capable of causing discoloration, staining, or damage.

1.7 WARRANTY

A. Furnish lifetime manufacturer warranty for gutter and downspout finishes.

PART 2 PRODUCTS

2.1 GUTTERS AND DOWNSPOUTS - ALUMINUM

A. Manufacturers:
   1. Mastic / Alcoa Aluminum Coil –Envoy Performance Coil Stock
   2. Approved Equal.

B. Product Description:
   1. Gutters: Pre-finished aluminum; SMACNA K style profile; 5 inch wide x 3 ½ inch deep.
   2. Downspouts: Pre-finished aluminum at upper wall areas, corrugated rectangular shape 2 inch x 3 inch unless noted otherwise, match existing being removed; SMACNA

2.2 COMPONENTS

A. Pre-Finished Aluminum Sheet: ASTM B209, manufacturer's standard alloy and temper for specified finish; 20 gauge [0.032 inch] thick for gutters and 24 gauge [0.020 inch] thick for downspouts; plain finish shop pre-coated with acrylic coating; color as selected from manufacturer's standard colors.

2.3 ACCESSORIES

A. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: Hidden hanger / anchors In accordance with SMACNA requirements with screw type fasteners.
   2. Gutter Supports: Concealed Hanger Brackets.
   3. Aluminum Downspout Supports: Straps with hidden fasteners.

B. Splash guard: Pre-finished aluminum valley splash guards, standard size and type.

C. Gutter Expansion Joint: SMACNA Figure 1-6 Lap Type Gutter Expansion Joint. Locate at 50' maximum intervals.

D. Gutter Guard: Perforated aluminum sheet 0.027 inch thickness, with baked enamel finish. Fabricated to fit into front of gutter and slip under first row of shingles. Secure to top edge of gutter. 4'-0" long sections. Color selected by Architect.
   1. Leaf Relief TP300 or Equal.

E. Fasteners: Hidden screw type, same material and finish as gutters and downspouts.

F. Primer: Zinc molybdate and Galvanized iron type for aluminum.

G. Precast Concrete Splashblocks: 12 inch wide by 24 inch long with formed cove for the discharge of water at one end.
   1. Install on a solid bed of grade or base as required to provide positive drainage away from building foundation.

2.4 FABRICATION

A. Form gutters and downspouts of profiles and sizes indicated.

B. Fabricate with required connection pieces.

C. Form sections to shape indicated on Drawings, square, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.5 FACTORY FINISHING

A. Acrylic polyester coating: Baked enamel system conforming to AAMA 2603.

B. PVDF (polyvinylidene fluoride) coating: Multiple coats, thermally cured, fluoropolymer system conforming to AAMA 2604 or AAMA 2605.

C. Primer Coat: Finish concealed side of metal sheets with primer compatible with finish system, as recommended by finish system manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces are ready to receive gutters and downspouts.

3.2 PREPARATION

A. Paint concealed metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to minimum dry film thickness of 15 mil.

3.3 INSTALLATION

A. Comply with SMACNA's "Architectural Sheet Metal Manual." Allow for thermal expansion; set true to line and level. Install Work with laps, joints, and seams permanently watertight and weatherproof; conceal fasteners where possible.
   1. Roof-Edge Flashings: Secure metal flashings at roof edges according to FM Loss Prevention Data Sheet 1-49 for specified wind zone.

B. Sealed Joints: Form non-expansion, but movable, joints in metal to accommodate elastomeric sealant to comply with SMACNA standards.

C. Fabricate nonmoving seams in sheet metal with flat-lock seams. For metals other than aluminum, tin edges to be seamed, form seams, and solder.

D. Separations: Separate non-compatible metals or corrosive substrates with a coating of asphalt mastic or other permanent separation.

E. Install gutters in one continuous sections sloped at ¼”- ½” every 20’-0” maximum. Anchor gutters to building using concealed gutter hanger brackets at 24" on center typical screwed directly into fascia/building structure. Attach aluminum gutters to fascia between ½” and 1” below drip edge of shingle. Shingle should extend 1” over gutter.
   1. Install gutter expansion joints at maximum of 50’ intervals.

F. Sheet Metal: Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts and accessories.

G. Slide gutter guard under first row of shingles. Snap front edge of gutter guard onto front of gutter. Verify that final installation is sloped from roof edge to front of gutter.

H. Direct downspout to discharge to underground storm drain piping or to precast concrete splashblock as indicated on drawings.

END OF SECTION

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SECTION 07 90 00 - JOINT PROTECTION

PART 1 GENERAL

1.1 SUMMARY

A. Section includes sealants and joint backing.

1.2 SUBMITTALS

A. Product Data: Submit data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations, and color availability.

1.3 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

1.4 QUALITY ASSURANCE

A. Sealant shall be installed by a qualified sealant applicator for any/all joint sealant exposed to view. Owner reserves the right to request a mockup of the quality for the joint sealant installation.

PART 2 PRODUCTS

2.1 JOINT SEALERS

A. Manufacturers:
1. Tremco [basis of design]
2. Sika
3. GE Silicones.
4. Pecora Corp.
5. DAP

B. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

C. Low-Emitting Interior Sealants: Sealants and sealant primers used inside the weatherproofing system 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."

D. Liquid-Applied Sealants: Comply with ASTM C920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C920 classifications for type, grade, class, and uses related to exposure and joint substrates.

E. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, provide products that comply with 21 CFR 177.2600.

F. Additional Movement Capability: Where additional movement capability is specified, provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated.

G. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range, unless otherwise noted.

2.2 SILICONE JOINT SEALANTS:

A. **Type S-1**: Single component, nonsag, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use NT

1. Tremco Spectrem 1 or Spectrem 800 or Equal

B. **Type S-2**: Single Component, nonsag, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 50, use NT
   1. Tremco Spectrem 2 or Spectrem 3 or Equal

C. **Type S-3**: Multi-Component, Nonsag, Silicone Joint Sealant: ASTM C920, Type M, Grade NS, Class 50, Use NT
   1. Tremco Spectrem 4-TS or Equal

D. **Type S-4**: Single Component, nonsag, Traffic-Grade, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 100/50, Use T
   1. Tremco Spectrem 800 or Equal

E. **Type S-5**: Mildew Resistant, Single Component, Silicone Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use NT
   1. Tremco Tremsil 200 Sanitary or Equal

2.3 URETHANE JOINT SEALANTS

A. **Type U-1**: Single Component, nonsag, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25 or 35, Use NT:
   1. Tremco Dymonic or Dymonic FC or Equal

B. **Type U-2**: Single Component, nonsag, Traffic Grade, Urethane Joint Sealant: ASTM C920, Type S, Grade NS, Class 25, Use T.
   1. Tremco Vulkem 116 or Equal.

C. **Type U-3**: Multi-Component, nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use T.
   1. Tremco Dymeric 240 or Dymeric 240 FC or Equal

D. **Type U-4**: Multi-Component, nonsag, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use NT.
   1. Tremco Vulken 227 or Equal

E. **Type U-5**: Multi-Component, nonsag, Traffic Grade, Urethane Joint Sealant: ASTM C920, Type M, Grade NS, Class 25, Use T.
   1. Tremco Vulken 227 or Equal

2.4 BUTYL JOINT SEALANTS

A. **Type B-1**: Butyl Rubber based Joint Sealants: ASTM C 1311
   1. Tremco General Purpose Butyl Sealant or Equal

2.5 LATEX JOINT SEALANTS

A. **Type L-1**: Latex Joint Sealant: Acrylic latex or Siliconized Acrylic Latex: ASTM C834, Type OP, Grade NF or better
   1. Tremco Tremflex 834 or Equal.

B. **Type L-2**: Paintable Mildew-Resistant Latex Joint Sealant: Acrylic Latex or Siliconized Acrylic Latex: ASTM C834, Type OP, Grade NF or better.
   1. Tremco Tremflex 834 or Equal.

2.6 ACCESSORIES

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin) as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and

density to control sealant depth and otherwise contribute to producing optimum sealant performance:
1. Oversized to 30 to 50 percent larger than joint width.

C. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F. Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

D. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

E. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated. Non-staining type, recommended by sealant manufacturer to suit application.

F. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

G. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify substrate surfaces and joint openings are ready to receive work.

B. Verify joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter impairing adhesion of sealant.

B. Clean and prime joints.

C. Perform preparation in accordance with ASTM C1193.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C1193.

B. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer.

C. Install bond breaker where joint backing is not used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

E. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

F. Tool joints concave.

3.4 SCHEDULE

A. Joint-Sealant Application: Exterior joints in vertical surfaces and non-traffic horizontal surfaces.
1. Joint locations such as, but not limited to:
    a. Construction joints in cast-in-place concrete.
    b. Control joints in unit masonry.
        1) Provide joint sealants slightly darker than the adjacent masonry units. Provide multiple colors as may be required for match.

c. Perimeter joints between masonry, concrete, or stone and frames of doors, windows, storefronts, louvers, and similar openings.
d. Lintels and shelf angles to masonry construction.
e. Butt joints between metal panels.
f. Control and expansion joints in ceiling/soffit and similar overhead surfaces.
g. Exterior joints between dissimilar materials where the joining of the two surfaces leaves a gap between the meeting materials or components as may be dictated by various methods of construction to make building watertight.
h. Other joints as indicated on Drawings.

2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-1, Type S-2, Type S-3**
3. Color: As selected by Architect from manufacturer's full range of colors.

B. Joint-Sealant Application: Interior joints in horizontal traffic surfaces.
1. Joint locations such as, but not limited to:
a. Isolation joints in cast-in-place concrete slabs.
b. Perimeter of floor slabs or concrete curbs which abut vertical surfaces.
c. Areas around all piping systems that penetrate the slab or foundation walls below grade (utility trenches, electrical conduits, plumbing penetrations, etc.).
d. Control and expansion joints in tile flooring.
e. Other joints as indicated on Drawings.
2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-4**
3. Color: As selected by Architect from manufacturer's full range of colors.

C. Joint-Sealant Application: Interior joints in vertical surfaces and horizontal non-traffic surfaces, subject to movement, unless otherwise noted.
1. Joint locations such as, but not limited to:
a. Control joints on exposed interior surfaces of exterior walls.
b. Interior joints where interior partitions meet exterior walls of dissimilar materials and components.
c. Other joints as indicated on Drawings.
2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-1**
3. Color: As selected by Architect from manufacturer's full range of colors. Paintable Sealant, prep for painted finish.

D. Joint-Sealant Application: Interior joints in vertical surfaces subject to abuse and movement.
1. Joint locations such as, but not limited to:
a. Vertical joints, including control joints and joints between masonry and structural support members, on exposed surfaces of interior unit masonry walls and partitions.
2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-2**
3. Color: As selected by Architect from manufacturer's full range of colors.

E. Joint-Sealant Application: Interior joints in vertical surfaces not subject to movement.
1. Joint locations such as, but not limited to:
a. Interior perimeter joints of exterior openings.
b. Perimeter joints between interior wall surfaces and frames of interior doors, windows, and elevator entrances.
c. Interior joints between dissimilar materials where a gap is created where materials meet, unless otherwise noted.
2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type L-1, Type L-2**
3. Color: As selected by Architect from manufacturer's full range of colors.

F. Joint-Sealant Application: Mildew-resistant interior joints in non-painted vertical surfaces and horizontal nontraffic surfaces.
   1. Joint locations such as, but not limited to:
      a. Interior joints between plumbing fixtures and adjoining floors and counters.
      b. Joints between countertops and backsplashes.
      c. For interior joints in non-painted vertical and horizontal surfaces where incidental food contact may occur.
      d. Tile control and expansion joints where indicated.
      e. Other joints as indicated on Drawings.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-5**
      a. For potable water storage sealant shall be certified by National Sanitation Foundation as conforming to the requirements of NSF Standard 61 – Drinking Water System Components – Health Effect.
      b. For surfaces where incidental food contact may occur sealant must comply with United States Department of Agriculture (USDA) guidelines for incidental food contact with cured sealant.
   3. Color: As selected by Architect from manufacturer's full range of colors.

G. Joint-Sealant Application: Mildew-resistant interior joints in painted vertical surfaces and horizontal non-traffic surfaces.
   1. Joint locations such as, but not limited to:
      a. Interior joints between plumbing fixtures and adjoining painted walls.
      b. Joints where countertops or backsplashes intersect painted walls.
      c. For interior joints in painted vertical and horizontal surfaces where incidental food contact may occur.
   2. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type L-2**
   3. Color: As selected by Architect from manufacturer's full range of colors.

H. Joint-Sealant Application: Interior or exterior joints in vertical surfaces between laps in fabrications of sheet metal.
   1. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type U-1**
   2. Color: As selected by Architect from manufacturer's full range of colors.

I. Joint-Sealant Application: Exterior joints under metal thresholds and saddles, sill plates, or as bedding sealant for sheet metal flashing and frames of metal or wood.
   1. Provide one of the following acceptable sealants as approved by manufacturer for substrates and uses indicated: **Type S-1, Type U-1, Type B-1**
   2. Color: As selected by Architect from manufacturer's full range of colors.

END OF SECTION

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SECTION 08 11 15 - PRE-ASSEMBLED METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Pre-assembled steel entry doors in wood / composite frames.

1.2 SUBMITTALS

A. Product Data: Submit frame and door configurations, core materials, finishes, fire ratings, and Energy Star Compliance.

1.3 QUALITY ASSURANCE

A. Perform glazing Work in accordance with the following:
   1. Insulated Glass: Fabricate insulated glass units in accordance with GANA (formerly FGMA) Glazing Manual.
   2. Safety Glass: Conform to CPSC 16 CFR 1201 and applicable codes.

B. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with a minimum five years documented experience.

D. Installer Qualifications: Company specializing in performing Work of this section with minimum two years documented experience with projects of similar scope and complexity.
   1. Installer shall be certified by Manufacturer.

1.4 WARRANTY

A. Furnish five year manufacturer’s warranty on workmanship and materials.

B. Furnish five year manufacturer’s warranty for insulated glass units from seal failure, interpane dusting or misting, including replacement.

PART 2 PRODUCTS

2.1 PRE-ASSEMBLED STEEL DOORS AND FRAMES

A. Manufacturers:
   1. Masonite: High Definition Steel Entry Doors.
   2. Therma-Tru: Profiles Steel Entry Doors, Equal to Above Style.
   3. Jeldwen: Premium Steel Exterior Door, Equal to Above Style.
   4. Lansing Housing Products

2.2 ENTRY DOORS

A. Construction: Tension-leveled cold rolled steel, zinc-coated, conversion coated to permit paint bond skins:
   1. Thickness: 1-3/4 inch thick; 24 gauge steel sheet face, 0.021 inch minimum.
   2. Door surface: smooth, flush style with glazed openings, design as indicated on Drawings
   3. Door Core Construction: Thermally Broken, wood stiles and rails, with foamed in place insulation.
   4. Door Edges: Machinable kiln-dried pine or engineered composite lumber mechanically locked to door faces, four sided full thermal break provided, lock area reinforced with solid blocking in full area of passage and deadbolt locksets.
   5. Door Bottom Edge: Moisture- and decay-resistant composite.

6. Door Bottom Edge Weatherstripping: Bottom Sweep compatible with accessible threshold; provide corner seal pads as required to seal bottom of door at frame.
7. Core: Foamed-in-place polyurethane, density 1.9 pcf minimum.
8. Finish: White primed. [ready for field paint]
9. Glazing Style: Clear, Full lite insulated glazing with internal mini-blinds, with raise and lower and tilt adjustment, set in raised composite wood grained molding frame.
10. Door Configuration: Frame hinge patio door – sized to fit existing rough opening / door being removed, left and right hand configurations to match existing.
11. Energy Efficiency: Meet applicable requirements for Energy Star Rating for Climate Zone 5.

2.3 DOOR FRAMES

A. Composite Frames: Rot-resistant door frame, mullions, and brickmold, as supplied by Door manufacturer. Formed with integral stop for weatherstripping; accessible style threshold.
   1. Jamb Width: +/- 4 9/16 or 6 9/16 inch; Match existing wall thickness, field verified by Contractor.
   2. Mullion: Storm door ready Mullion [& Adaptor as required]; nominal 2 inch width
   3. Trim: Composite 2” brickmold
   4. Sill: High Dam type unless located in accessible unit - ADA / accessible style threshold with Thermal Break, aluminum construction, mill finish
   5. Hinges: Steel, full mortise ball bearing type; 4 x 4 inches, finish to match door hardware specified in Section 08 71 00.
   6. Finish: Painted

2.4 COMPONENTS

A. Steel Sheet: Galvanized to ASTM A653/A653M G60 coating class.

B. Insulation: Polyurethane.

C. Insulating Glass: Sealed double pane units with Low E coating with internal grid. Meet applicable Energy Star Requirements for Climate Zone 5
   1. Outer Pane: Clear fully tempered safety glass, Low-E Coating.
   2. Inner Pane: Clear fully tempered safety glass.
   3. Pane Thickness: Minimum 1/8 inch thick.
   4. Minimum Total Unit Thickness: 5/8 inch minimum.
   5. Internal Decorative Pattern: as indicated on Drawings.

2.5 HARDWARE

A. Weatherstripping: Jacketed, thermoset open-cell foam, press-fit in kerfs at jamb stops in frames. Medium Reach Compression type; Bottom sweep compatible with accessible threshold.
   1. Note: insulation shall be installed to fully prevent passage of light and air thru any gaps in the frame and door leaf.

B. Hardware Finish: US 26D [unless directed Otherwise by Owner]

C. Remainder of Hardware: Specified in Section 08 71 00.

2.6 INTERIOR DOORS AND FRAMES WITHIN DWELLING UNITS

A. Refer to Section 08 14 00

2.7 ACCESSORIES

A. Door Casings:
   1. Exterior: 2 inch brickmold or 1x trim
   2. Interior: As specified in Section 06 20 00.

B. Bituminous Coating: Non-asbestos fibered asphalt emulsion.

C. Primer: Manufacturer's standard rust inhibitive type.

2.8 FABRICATION

A. Fabricate doors and frames as pre-hung single piece jamb units with continuous threshold for each opening.

B. Fabricate pre-hung units with hardware reinforcement welded in place.

C. Configure exterior frames to accept weatherstripping.

D. Factory glaze doors.

E. Attach fire rating label to each fire rated door and frame.

2.9 FACTORY FINISHING

A. Doors and Frames:
   1. Primer: Baked on dry powder.
   2. Finish Coating: Field Applied.

B. Hardware Finish:
   1. Steel Components: Satin chrome finish or with finishes to match door hardware as applicable.
   2. Aluminum Components: Mill finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify framed openings are correct size and thickness and project conditions are acceptable.

3.2 INSTALLATION

A. Install units in accordance with manufacturers installation instructions.

B. Install fire rated assemblies in accordance with NFPA 80.

C. Install doors and frames plumb, level and square.

D. Coordinate installation of hardware specified in Section 08 71 00.

E. Field Finishing: As specified in Section 09 90 00.

F. Adjust door and frame units to ensure smooth and balanced movement.

3.3 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edges, crossed corner to corner.

3.4 SCHEDULES

A. Exterior Entry Doors: Steel door with wood / composite frame; sized per drawings, style as indicated on drawings; with continuous threshold. Hardware per section 08 71 00.

END OF SECTION

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SECTION 08 11 63 - METAL STORM DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes glazed aluminum storm doors and frames and operating hardware.

1.2 SUBMITTALS

A. Product Data: Provide data indicating door construction, type of corner reinforcement, hardware, method of glazing, installation tolerances, and door elevation.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with AAMA 1102.7 - Voluntary Specification for Aluminum Storm Doors.

PART 2 PRODUCTS

2.1 METAL STORM DOORS

A. Manufacturers:
   1. Larson, Venting Storm Doors, Model 360-16 Midview [basis of design]
   2. ProVia
   3. Approved Equal

B. Product Description: Metal storm door unit; AAMA 1102.7 Manufacturer's standard unit, complete with glazing, screens, accessories, and hardware.
   1. Finish: as selected from manufacturer’s full range of color options, including premium colors.
   2. Glazing: Single pane, tempered safety glass, clear.

2.2 COMPONENTS

A. Door Stiles and Rails, and Frame Sections: Hollow extruded aluminum sections, structurally sufficient to suit opening sizes. Assemble stiles and rails with hairline mitered corner joints, aligned and secured with corner spigots and fasteners.

B. Hardware:
   1. Hinge: manufacturer standard Continuous piano type. [color matched to aluminum frame]
   2. Latch and Handleset: Lever on exterior, lever on interior, with key and cylinder.
      a. Finish: As selected from manufacturer’s full range of finishes
      b. Coordinate keying requirements with Owner. Re-key to match unit cores, provide [3] copies of each key once re-keyed to match building standards.
   3. Closer: Adjustable, spring loaded, hydraulic cylinder with hold open feature.
   4. Stop: Storm chain with spring safety cushion.
   5. Weatherstripping: Full perimeter resilient type, with sill sweep for full width of door leaf, fitted into bottom rail.

C. Glazing Track: Aluminum extrusions, double track for vertical operation of glass panes and insect screens. Fit with spring loaded retracting pin position retainers.

D. Panel Below Glazing: Sheet aluminum.

E. Insect Screen: Woven vinyl-coated glass yarns, ASTM D3656, Class 2 nylon, 18 by 14 mesh.

F. Sealant: Specified in Section 07 90 00.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify opening sizes.

3.2 INSTALLATION

A. Install units, accessories and hardware in accordance with ASTM E737 and AAMA 1102.7.

B. Coordinate installation with new patio doors. Size units to fit new patio doors.

C. Coordinate installation of hardware such that hardware does not conflict with the hardware of the patio door.

D. Apply bed of sealant to mating surface of door frame before installation.

E. Accurately fit door frame to opening and adjust door for proper operation before securing.

END OF SECTION

SECTION 08 14 00 - WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes pre-hung composite interior wood doors and frames within individual dwelling units.

1.2 SUBMITTALS

A. Shop Drawings: Indicate door elevations, cutouts for hardware preparation.

B. Product Data: Submit information on door core materials and construction, and on veneer species, type and characteristics.

C. Samples: Submit samples of door veneer illustrating pre-finished stain color selections and finish as specified.

1.3 QUALITY ASSURANCE

A. Perform work in accordance with NWWDA I.S.1.

1.4 WARRANTY

A. Furnish five year manufacturer's warranty for interior doors.

PART 2 PRODUCTS

2.1 WOOD DOORS

A. Manufacturers:
1. Masonite, Molded Panel Series Doors
2. Jeldwen
3. Approved Equal

B. Product Description:
1. 1-3/8 inches thick side-hinged door systems
2. Molded wood fiber facing, wood stiles, wood or MDF rails, and engineered low-density composite core
3. Door facings bonded to stiles, rails, and core forming a 3-ply structural attachment.
4. Internal reinforcement for hardware
5. 2 and 6 panel molded design [refer to Drawings]
6. Smooth face
7. Factory primed, ready for site finish
8. Factory pre-fit in wood frames

2.2 DOOR FRAMES

A. Frames: Brown Moulding Company or Equal:
1. Clear white pine wood jambs [single piece jamb] with applied stops. Sides dadoed to receive head.
2. Prep for hinges and hardware.
3. Frames suitable for painted finish.
4. Verify jamb thickness of door frames with existing conditions. Wall thicknesses vary from location to location.

2.3 ACCESSORIES

A. Hinges: 1 ½ pair 3 1/2" x 3 1/2", 26D finish to match door hardware.

B. Louvers: Full wood louvers; standard type set in wood frame.

2.4 FABRICATION

A. Fabricate doors in accordance with NWWDA I.S.1 requirements.

B. Frame: Stapled leg to head joints.

C. Astragals for Double Doors: None

D. Fabricate doors with hardware reinforcement blocking in place.

E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware.

F. Factory fit doors for frame opening dimensions.
   1. Field verify existing wall thickness and adjust jamb thickness as required.

G. Hardware: As specified in 08 71 00 and in finishes specified.

2.5 FINISH

A. Prep doors and frames for site finishing, painted finish.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install doors in accordance with NWWDA I.S.1 requirements.

B. Adjust door for smooth and balanced door movement.

C. Tolerances:
   1. Conform to NWWDA requirements for fit and clearance tolerances and maximum diagonal distortion.
   2. Maximum Diagonal Distortion:1/4 inch measured with straight edge, corner to corner.

3.2 SCHEDULE

A. Interior doors: Match size and configuration/swing as designed on drawings.

B. Undercut doors 1” for opening.

END OF SECTION

SECTION 08 31 13 - ACCESS DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: **Fire-resistive-rated and non-rated** Access doors and panels with frames.

1.2 SUBMITTALS

A. Product Data: Indicate sizes, types, finishes, hardware, scheduled locations, fire-resistance listings, and details of adjoining Work.

B. Manufacturer's Installation Instructions: Include rough-in dimensions.

1.3 QUALITY ASSURANCE

A. Fire-Rated Access Door Construction:
   1. Wall Access Doors: NFPA 252 or UL 10B.
   2. Ceiling Access Doors: ASTM E119 or UL 263.

B. Installed Fire-Rated Access Door Assembly: Conform to NFPA 80 for fire-rated class as indicated.

C. Attach label from agency approved by authority having jurisdiction to identify each fire-rated access door.

1.4 COORDINATION

A. Coordinate Work with Work requiring controls, valves, traps, dampers, cleanouts, and similar items requiring operation being located behind finished surfaces.

PART 2 PRODUCTS

2.1 ACCESS DOORS AND PANELS

A. Flush Framed Access Doors (Type 1): Frames and nominal 1 inch wide exposed flanges of 16 gage steel and door panels of 14 gage steel.

B. Fire-Rated Access Doors (Type 2): Frames and nominal 1 inch wide exposed flanges of minimum 16 gage steel and door panels of 20 gage steel. Provide self-closing and latching doors with cam lock.

2.2 FABRICATION

A. Fabricate units of continuous welded construction; weld, fill, and grind joints to assure flush and square unit.

B. Wall and Ceiling Access Door and Panel Hardware:
   1. Hinge: Standard continuous or concealed spring pin type, 175-degree steel hinges.
   2. Lock: Self-latching lock. Screw driver slot for quarter turn cam lock.

2.3 SHOP FINISHING

A. Base Metal Protection: Prime coat units with baked on primer.

B. Finish: to match adjacent wall/ceiling surface.

PART 3 EXECUTION

3.1 INSTALLATION

A. Set concealed frame type units flush with adjacent finished surfaces.

B. Position unit to provide convenient access to concealed Work requiring access.

C. Install fire-rated units according to NFPA 80 and requirements for fire listing.

3.2 SCHEDULES

A. Provide and install access panels where required by existing construction, utilities, etc. Field coordinate requirements, sizes, and locations.

END OF SECTION

SECTION 08 36 13 - SECTIONAL DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes power operated overhead sectional doors of steel panels of flush design, operating hardware, operator, and controls.

1.2 SYSTEM DESCRIPTION

A. Operating System: Electric operation with manual operation in case of power failure. Transit speed of 12 inches per second.

1.3 SUBMITTALS

A. Shop Drawings: Indicate opening dimensions and tolerances, component construction, connections and details, anchorage methods and spacing, hardware and locations, and installation details.

B. Product Data: Submit data on electric operating devices.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit data for overhead door, controls, and maintenance requirements

1.5 QUALITY ASSURANCE

A. Perform Work in accordance with DASMA 102.

B. Surface Burning Characteristics:
   1. Foam Insulation: Maximum 75/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Apply label from agency approved by authority having jurisdiction to identify each foam plastic insulation board.

1.6 WARRANTY

A. Provide 15 year limited against splitting and cracking, 10 year on hinge and track and all other components for 1 year.

PART 2 PRODUCTS

2.1 SECTIONAL OVERHEAD DOORS

A. Manufacturers:
   1. Clopay Building Products – Basis of Design, Classic Value Series, Traditional Long Panel
   2. Overhead Door Company
   3. Wayne-Dalton Corporation

B. Product Description: Steel sectional overhead doors, electric operation, and associated hardware.
   1. Door Assembly: Rigid steel construction; non-insulated.
   2. Door Nominal Thickness: 2 inches thick.
   3. Panel Style: tongue and groove, long panel
   4. Exterior Steel: Residential grade high strength hot-dipped galvanized steel with an embossed simulated wood grain texture, 25 gauge.
   5. Windows: none.
   6. Finish and Color: Two coat baked-on polyester. Color as selected from full range of manufacturer colors. Field paint as directed by Architect.
   7. Hardware: Standard garage door hardware

8. Bottom Fixture: DASMA 103 tamper resistant fasteners
9. Weatherstripping: Extruded PVC bulb type strip at bottom.
10. Track: Provide track as recommended by manufacturer to suit installation.
11. Rollers: Nylon
12. Manual Operation: Pull rope.

2.2 TRACKS, SUPPORTS, AND ACCESSORIES

A. Tracks: Manufacturer's standard, galvanized-steel track system of configuration indicated, sized for door size and weight, designed for lift type indicated and clearances shown on Drawings, and complying with ASTM A 653 for minimum G60 zinc coating. Provide complete track assembly including brackets, bracing, and reinforcement for rigid support of ball-bearing roller guides for required door type and size. Slot vertical sections of track spaced 2 inches apart for door-drop safety device. Slope tracks at proper angle from vertical or design tracks to ensure tight closure at jambs when door unit is closed.

B. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.

C. Track Reinforcement and Supports: Galvanized-steel track reinforcement and support members, complying with ASTM A 36 and ASTM A 123. Secure, reinforce, and support tracks as required for door size and weight to provide strength and rigidity without sag, sway, and vibration during opening and closing of doors.
   1. Vertical Track Assembly: Track with continuous reinforcing angle attached to track and attached to wall with jamb brackets.
   2. Horizontal Track Assembly: Track with continuous reinforcing angle attached to track and supported at points from curve in track to end of track by laterally braced attachments to overhead structural members.

D. Weatherseals: Replaceable, adjustable, continuous, compressible weather-stripping gaskets of flexible vinyl, rubber, or neoprene fitted to bottom and top of sectional door unless otherwise indicated.

E. Safety Edge: At bottom of door panel, full width; electro-mechanical or pneumatic sensitized type, wired to reverse door upon striking object; hollow neoprene or rubber covered to provide weatherstrip seal.

F. Photoelectric Sensor: Furnish system which detects obstruction and reverses door without requiring door to contact obstruction.

2.3 LOCKING DEVICES

A. Slide Bolt: Fabricate with side-locking bolts to engage through slots in tracks for locking by padlock, located on single-jamb side, operable from inside only.

2.4 ELECTRIC OPERATOR

A. Center mounted in ceiling, Chain driven operator, DC motor, LED lighting, App-software, adjustable safety friction clutch, brake system actuated by independent voltage solenoid, mounting brackets and hardware. Liftmaster 84602 MC or Equal.
   1. Provide [2] remotes.
   2. Provide [1] control station with single button, momentary contact type, 24 volt circuit, surface mounted. Locate at man door to garage.
   3.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify wall openings are ready to receive work and opening dimensions and tolerances are within limits.

3.2 PREPARATION

A. Prepare door opening components to permit installation of door unit and preserve continuity of wall air barrier and vapor retarder seal.

3.3 INSTALLATION

A. Anchor components securely to wall construction and building framing without distortion or stress. Secure tracks to structural members only.

B. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.

C. Coordinate installation of electrical service. Complete wiring from disconnect to unit components.

D. Install electric operator and adjust to smooth operation.

E. Coordinate installation of sealants and backing materials at frame perimeter as specified in Section 07 90 00.

END OF SECTION

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SECTION 08 53 00 - VINYL WINDOWS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes factory fabricated tubular extruded vinyl windows with fixed and operating sash [double hung], glass, and framed insect screens.

1.2 SYSTEM DESCRIPTION

A. Windows: Extruded tubular plastic sections, factory fabricated, fusion welded, vision glass, related flashings, anchorage and attachment devices.

B. System Design: Performance to provide for expansion and contraction within system components caused by temperature cycling. Design and size members to withstand loads caused by pressure and suction of wind in accordance with applicable code.

C. Water Leakage: None, when measured in accordance with ASTM E331.

D. System Internal Drainage: Drain water entering framing system, to exterior.

E. Thermal Movement: Design sections to permit thermal expansion and contraction of plastic as compared to glass, infill, and perimeter opening construction.

1.3 REFERENCES

A. American Architectural Manufacturers Association (AAMA):
   1. AAMA 502 - Voluntary Specification for Field Testing of Newly Installed Fenestration Products.

B. American Architectural Manufacturers Association/Window & Door Manufacturers Association/Canadian Standards Association (AAMA/WDMA/CSA):
   1. AAMA/WDMA/CSA 101/I.S.2/A440 - Standard/Specification for Windows, Doors, and Skylights.

C. National Fenestration Rating Council (NFRC):
   1. NFRC 100 - Procedure for Determining Fenestration Product U-factors.
   2. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence.

1.4 PERFORMANCE REQUIREMENTS

A. Product Standard: Comply with AAMA/WDMA/CSA 101/I.S.2/A440 for definitions and minimum standards of performance materials, components, accessories, and fabrication unless more stringent requirements are indicated.

B. Performance Class and Grade: AAMA/WDMA/CSA 101/I.S.2/A440 as follows:
   1. Minimum Performance Class: R.
   2. Minimum Performance Grade: 20.

C. Fabricate windows to AAMA Gold Label Certification Program for thermal performance and air, water, and structural integrity.

D. Forced Entry Resistance: Meet the requirements of ASTM F588 for Type A [sliding sashes], Grade 10.

E. Air Infiltration: Maximum air leakage through fixed glazing and framing areas of 0.30 cfm/sq ft of fixed wall area as determined according to ASTM E283 at a minimum static-air-pressure differential of 1.57 lbf/sq ft.

F. Operating Force: Maximum allowable lb force of 30 lbf.

G. Water Penetration: Minimum water resistance of 2.86 psf for entry level R20 structural rating.

H. U-Factor, Total Unit, NFRC 100: U = 0.30Btu/sq ft x°h x degrees F.

I. Visible Transmittance, Total Unit, NFRC 200 maximum whole window SHGC of 0.30.

J. Window Certification:
   1. Test windows to AAMA Gold Label Certification Program for thermal performance and air, water, and structural integrity.
   2. Provide certification label on each window.

1.5 SUBMITTALS

A. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work; and installation requirements.

B. Product Data: Submit component dimensions, anchorage and fasteners, glass, and internal drainage details. Indicate Energy Star compliance.

C. Test Reports: Submit manufacturer's test reports from independent testing agency indicating the vinyl windows meet or exceed the specified performance requirements.

D. Samples: Provide [2] samples of exposed finishes.

1.6 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Manufacturer regularly engaged, for past 10 years, in manufacture of vinyl windows of similar type to that specified.

B. Installer's Qualifications:
   1. Installer regularly engaged, for past 5 years, in installation of vinyl windows of similar type to that specified.
   2. Employ persons trained for installation of vinyl windows.

C. Mockup:
   1. Construct mock-ups of vinyl windows for evaluation of preparation techniques and installation workmanship.
      a. Construct mock-ups using same materials for use in the Work.
      b. Construct mock-ups at locations determined by Architect.
      c. Do not proceed until workmanship of mock-ups are approved by Architect.
      d. Approved Mock-ups: Standard for workmanship of vinyl windows.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly identifying product name and manufacturer.

B. Storage and Handling Requirements:
   1. Store and handle materials in accordance with manufacturer's instructions.
   2. Keep materials in manufacturer's original, unopened containers and packaging until installation.
   3. Store materials in clean, dry area indoors.
   4. Do not store materials directly on floor.
   5. Protect materials and finish during storage, handling, and installation to prevent damage.

1.8 WARRANTY

A. Furnish limited ten [10] year manufacturer warranty for insulated glass units and vinyl window components.

PART 2 PRODUCTS

2.1 VINYL WINDOWS

A. Manufacturers:
   1. Jeldwen Windows, Builders Vinyl Series
   2. Simonton Windows by PlyGem: Reflections 5500 Series
   3. Pella Windows
   4. Silverline by Anderson Windows
   5. Soft Lite Windows
   6. Crystal Windows

B. Product Description:
   1. Unit Frame: Extruded tubular plastic with fusion welded corner construction.
      a. Pocket / Replacement frame without nailing fin.
   2. Windows: Conform with AAMA 101 Designations for windows required for Double Hung window operation.
   3. Type: 2 lite double hung
   4. Sizes: As indicated on drawings.
   5. Frame and Sash Color: As selected from full range of available colors. Interior and Exterior Surfaces to be the same color.

2.2 COMPONENTS

A. Extruded PVC frames and sashes: AAMA 303 hollow, multi-chambered sections of extruded polyvinyl chloride (PVC), with integral ultra-violet degradation resistance. Fusion Welded frame and sash.

B. Frame
   1. Frame Thickness: +/- 3-1/4 inches
   2. Construction: Welded, thermally broken
   3. Screen Track: Integral
   4. Sill: sloped design sill out from unit/building wall.

C. Sash
   1. Construction: Welded
   2. Glazing Bead: Color Matched, dual durometer

D. Glass and Glazing Materials:
   1. Gas: Argon Filled Airspace
   2. Glass Strength: Single Strength [annealed glass]
   3. Glass Type: Low E
   4. Dual Pane Insulated Glass: 3/4 inch thickness
   5. Spacer: Stainless Steel Window Spacer System
   6. Glass Package: Maximum U-value of 0.30
   7. Safety glass conforming to ANSI Z97.1 and applicable codes where required.

E. Hardware: Manufacturer's standard window hardware based on following requirements. Hardware to match frame and sash color.
   1. Sash Lock: [2] Lever handles with cam lock.
   2. Balance: Block and tackle System
   3. Safety / Night Latch [Window opening Control Device]: safety catch to limit operation of window opening for security and safety purposes.

F. Sills, Stools, and Aprons: Tubular plastic; slope sills for positive wash; extend 1/2 inch beyond wall face; one piece full width of opening.

G. Frame Expanders: Vinyl frame expanders/receptors sized as required to suit opening extending to meet existing construction and ready to accept new window units.

H. Insect Screens:
   1. Frame: Roll formed
   2. Size: to fit half of window unit.
   3. Mesh: Fiberglass mesh set into frame and secured.

I. Weather Stripping: Dual fin seal at sash perimeter, triple weather stripped at sash edges, closed cell foam weather stripping, configured for flexible fit.

J. Trim/Closure: Vinyl trim stock for interior perimeter/jamb application. Color to match window units.
   1. Field Coordinate size requirements to conceal any gap between original window and new window.

K. Fasteners: Galvanized steel.

L. Anchor Devices: Galvanized steel.

M. Sealant and Backing Materials: Specified in Section 07 90 00.

2.3 FABRICATION

A. Fabricate framing, mullions and sash members with fusion welded corners and joints, in rigid jig. Supplement frame sections with internal reinforcement where required for structural rigidity.

B. Form snap in glass stops, closure molds, weather stops, and flashings of extruded PVC for tight fit into window frame section.

C. Install glass using exterior dry method of glazing.

D. Fit insect screen frames with four spring loaded pin retainers.

E. Double weatherstrip operable units.

2.4 SHOP FINISHING

A. Exterior Surfaces: as selected from Manufacturer’s standard colors.

B. Interior Surfaces: Manufacturer’s standard colors.

C. Screens: Match window frame color with light screening.

D. Operators/Hardware: color to match unit

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify rough openings are correctly sized and located.

B. Examine abutting wall flashing, vapor retarders, weather barriers, and other components to ensure weathertight window installation.

C. Verify rough opening dimensions, sill levelness, and operational clearances are acceptable.

D. Notify Architect of conditions that would adversely affect installation or subsequent use.

E. Do not begin installation until unacceptable conditions are corrected.

3.2 PREPARATION

A. Prepare opening to permit correct installation of frame and achieve continuity of air and vapor retarder seal.

3.3 INSTALLATION

A. Use anchorage devices to securely attach frames to structure.

B. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work. Anchor windows securely in place to supporting substrate. Verify that windows are installed in proper relation to wall flashing and other abutting materials to achieve a watertight installation.

C. Install vinyl windows in accordance with manufacturer's instructions at locations indicated on the Drawings.

D. Install vinyl windows plumb, level, square, true to line, and without distortion.

E. Anchor vinyl windows securely in place to supports.

F. Verify vinyl windows are installed in proper relation to wall flashing and other abutting materials. Coordinate attachment and seal of air and vapor retarder materials. Pack fibrous insulation (or low expansion foam) in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

G. Install vinyl windows weathertight.

H. Verify vinyl windows open, close, and lock properly.

I. Install interior vinyl trim at perimeter of window unit as applicable to the conditions.

J. Coordinate installation of perimeter sealants and backing materials with Section 07 90 00.

3.4 SCHEDULES

A. Refer to drawings.

B. Refer to drawings/schedules for tempered glazing requirements.

END OF SECTION

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SECTION 08 71 00 - DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes hardware for interior and exterior doors.
   1. Provide cylinders and keys for all units.

1.2 SUBMITTALS

A. Shop Drawings:
   1. Indicate locations and mounting heights of each type of hardware, schedule, and catalog cuts.
   2. Submit manufacturer's parts list, and templates.

B. Manufacturer's installation instructions: Submit special procedures, and perimeter conditions requiring special attention.

1.3 CLOSEOUT SUBMITTALS

A. Project Record Documents: Record actual locations of installed cylinders and their master key code.

B. Operation and Maintenance Data: Submit data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

C. Keys: Deliver with identifying tags to Owner by security shipment direct from hardware supplier.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with the following requirements:
   1. ANSI A156 series.
   2. NFPA 80 - Fire Doors and Windows.
   3. NFPA 101 - Life Safety Code.

B. Furnish hardware marked and listed in BHMA Directory of Certified Products.

C. Coordinate work with other directly affected sections involving manufacture or fabrication of internal reinforcement for door hardware and recessed items.
   1. Provide templates or actual hardware as required to ensure proper preparation of doors and frames.

D. Coordinate Owner's keying requirements during course of work.

1.5 WARRANTY

A. Furnish five year manufacturer warranty for door hardware.

1.6 MAINTENANCE SERVICE

A. Provide special wrenches and tools applicable to each different or special hardware component.

PART 2 PRODUCTS

2.1 DOOR HARDWARE

A. Lockset, Latch Set, and Cylinder Manufacturers:
   1. Schlage Lock or Equal, ALX Series cylindrical locks, Grade 2 locks, Rhodes Handle Design, keyway to match SMHA standard interchangeable core, including existing master keying

B. Deadlock Manufactures:
   1. Schlage Lock or Equal, B500 Series Deadbolt.

C. Cylinders: Interchangeable cores
   1. Match SMHA standards, field verify all requirements.

2.2 COMPONENTS

A. General Hardware Requirements: Where not specifically indicated, comply with applicable ANSI A156 standard for type of hardware required. Furnish each type of hardware with accessories as required for applications indicated and for complete, finished, operational doors.
   1. Templates: Furnish templates or physical hardware items to door and frame manufacturers sufficiently in advance to avoid delay in Work.
   2. Reinforcing Units: Furnished by door and frame manufacturers; coordinated by hardware supplier or hardware manufacturer.
   3. Fasteners: Furnish as recommended by hardware manufacturer and as required to secure hardware.
      a. Finish: Match hardware item being fastened.

B. Hinges: ANSI A156.1, full mortise type, template type, ANSI A156.7, complying with following general requirements unless otherwise scheduled.
   1. Widths: Sufficient to clear trim projection when door swings 180 degrees.
   2. Number: Furnish minimum three hinges to 90 inches high, four hinges to 120 inches high for each door leaf.
      a. Residential Interior Wood Doors: Furnish minimum three hinges.
      b. Size and Weight: Doors 1-3/8” thick: 3-1/2” size.
   3. Pins: Furnish nonferrous hinges with non-removable pins (NRP) at exterior doors, non rising pins at interior doors.
   4. Tips: Flat button tips with matching plug.
   5. Provide three spare sets.

C. Locksets: Furnish locksets compatible with specified cylinders. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt verify type of cutouts provided in metal frames.
   1. Bored (Cylindrical) Locksets: ANSI A156.2, Series 4000, Grade 2 unless otherwise indicated.

D. Latch Sets: Match locksets. Typical 2-3/4” backset. Furnish standard strikes with extended lips to protect trim from being marred by latch bolt.
   1. Bored (Cylindrical) Latchsets: ANSI A156.2, Series 4000, Grade 2 unless otherwise indicated.

E. Push/Pulls, Gaskets, Thresholds, and Trim: Furnish as indicated in Schedule, with accessories as required for complete operational door installations.
   1. Kickplates: ANSI A156.6, metal; 8 inch high, 1 inch less than door width; stainless steel.
   2. Weatherstripping: Furnish continuous weatherstripping at top and sides of exterior doors.
   3. Thresholds: Maximum 1/2 inch height; requirements to ensure accessibility for persons with disabilities.

F. Cylinders: Furnish new interchangeable cores, Falcon C606, 6 pin design with “A” standard keyway to match Owner standard installation.

G. Keying: Keyed as directed by Owner to integrate with existing Keying Schedule.
   1. Keys: Nickel silver. Stamp keys with “DO NOT DUPLICATE”.
   2. Supply keys in the following minimum quantities
      a. 5 master keys.
      b. 3 keys per residential unit.

H. Pocket Door Hardware
   1. Privacy Latch: Johnson Hardware #1521 Suncrest Privacy Door Lock with Emergency Release.
   2. Back to Back Pulls: Hagar Co.: Round Wrought Door Pulls H5D, 5 ½" center to center spacing. Installation for back to back.

I. Door Viewers: 1-way viewing, three precision ground optical glass lenses, 180 degree angle viewing.

J. Bi-Fold Door Hardware: Johnson 200FD or 200FS or Equal, top hung bi-fold door hardware

K. Bi-Pass Door Hardware: Johnson 200 SD or Equal, top hung sliding door hardware with I-Beam rail

2.3 ACCESSORIES

A. Lock Trim: Furnish levers with 2 3/8" rose.

B. Through Bolts: Through bolts and grommet nuts are not permitted on door faces in occupied areas unless no alternative is possible.
   1. Do not permit through bolts on solid wood core doors.

2.4 FINISHING

A. Finishes: ANSI A156.18; with following finishes except where otherwise indicated in Schedule at end of section.
   1. Hinges:
      a. BHMA 626, satin finish.
   2. Typical Exterior Exposed and High Use Interior Door Hardware:
      a. BHMA 626, satin chromium plated brass.
   3. Typical Interior Door Hardware:
      a. BHMA 626, satin chromium plated brass.
   4. Thresholds: Finish appearance to match door hardware on exterior face of door.
      a. BHMA 628, satin aluminum, clear anodized.
   5. Other Items: Provide manufacturer's standard finishes matching similar hardware types on same door, and maintaining acceptable finish considering anticipated use and BHMA category of finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify doors and frames are ready to receive work and dimensions are as indicated on shop drawings and as instructed by manufacturer.

3.2 INSTALLATION

A. Coordinate mounting heights with door and frame manufacturers. Use templates provided by hardware item manufacturer.

B. Mounting Heights from Finished Floor to Center Line of Hardware Item: Comply with manufacturer recommendations and applicable codes.
   1. Locksets: 38 inches
   2. Dead Bolt: 48 inches
   3. Top Hinge: Jamb manufacturer's standard, but not greater than 10 inches from head of frame to centerline of hinge.
   4. Bottom Hinge: Jamb manufacturer's standard, but not greater than 12-1/2" from floor to centerline of hinge.
   5. Intermediate Hinges: Equally spaced between top and bottom hinges and from each other.

6. Door Viewers:
   a. Door viewer: 48” and 60” AFF at accessible units.

3.3 ADJUSTING

A. Adjust hardware for smooth operation.

3.4 SCHEDULE

A. The following hardware sets are intended to establish type and standard of quality when used together with these section requirements. Examine Drawings and Specifications and furnish proper hardware for door openings.

1. Each new door requires two (2) of the Rockwood 528 stop. Also provide wall mounted plastic door stop plate at any door adjacent to a gypsum wall.

Hardware Set H-1: Entry Doors

Hinges:	1-1/2 pair, 4x4 butt hinges
Stops:	Rockwood 528, plastic wall plate
Lock Set:	ANSI function F75 [passage latchset]
Dead Bolt	ANSI function E0152
Door Viewer:	Hager 1756, US 26D [quantity of 2 at ADA units]
Weatherstripping	Compression type
Threshold	Accessible / saddle threshold
Kickplate	8” high stainless steel kickplate [front entry & rear entry only]

Hardware Set H-2: Passage

Hinges:	By door manufacturer [26D finish]
Stops:	[2] Rockwood 528, plastic wall plate
Latch Set:	ANSI function F75 [passage latchset]

Hardware Set H-3: Privacy

Hinges:	By door manufacturer [26D finish]
Stops:	[2] Rockwood 528, plastic wall plate
Latch Set:	ANSI Function F76 [privacy lock]

Hardware Set H-4: Double Door

Hinges:	By door manufacturer [26D finish]
Latch Set (each leaf):	ANSI Function – [single dummy trim – each door leaf]
Catch:	Hager 1446 Ball Catch with strike [each door leaf]
Door Stops:	[2] Hinge stops each leaf
	No astragal

Hardware Set H-5: Overhead Garage Door

Track / Rollers / locks: By door manufacturer

All hardware to have 26D [BHMA 626] or equal finish – all finishes of hardware to match

Refer to Drawings

See Part 2.2 Components above for accessories and other hardware.

END OF SECTION

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SECTION 09 21 16 - GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes gypsum board with joint treatment; tile backer board.

1.2 SUBMITTALS

A. Product Data: Submit data on each type of gypsum board, backer board, joint tape and accessories.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with GA-201 - Gypsum Board for Walls and Ceilings. GA-214 - Recommended Specification: Levels of Gypsum Board Finish. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board. GA-600 - Fire Resistance Design Manual.

B. Surface Burning Characteristics:
   1. Textile Wall Coverings: Comply with one of the following:
      a. Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

C. Mock-up:
   1. Provide mockup of the quality of finishes for one wall that indicates the level of finish quality. Approved mockup will become standard for comparing other work.
   2. Provide mockup of the quality of finishes for one ceiling area that indicates the level of finish quality for knockdown stomped ceiling finishes. Approved mockup will become standard for comparing other work.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

A. Manufacturers:
   1. United States Gypsum Co.
   2. BPB Americas Inc.
   3. G-P Gypsum Corp.
   4. National Gypsum Co.
   5. Certainteed.

B. General Requirements: Comply with ASTM C 1396. Provide in maximum lengths and widths available that will minimize joints in each area, and will correspond to the supporting structure / framing.
   1. Long Edges: Tapered
   2. Ends: Square
   3. Size: Provide maximum lengths and widths available that will minimize joints in each area and that correspond with support system indicated.

2.2 GYPSUM BOARD TYPES

A. Gypsum Board [Type GB-1]: “standard drywall”
   1. Thickness: 1/2 inch

B. Mold-Resistant Gypsum Board [Type GB-2]:
   1. Core: mold-moisture resistant core and surfaces
   2. Thickness: 1/2 inch
   3. Mold Resistance: ASTM D 3273, score of 10 according to ASTM D 3274.

C. Non-Paper Faced Gypsum Board [Type GB-3]:
   1. Core: mold-moisture resistant core and surfaces
   2. Facer: fiberglass matt facer laminated to both sides, designed for interior use.
   3. Thickness: 1/2 inch
   4. Mold Resistance: ASTM D 3273, score of 10 according to ASTM D 3274.

D. Fire-Resistant Gypsum Board [Type GB-4]:
   1. Type X fire resistant type, high density
   2. Thickness: 5/8 inch.

E. Mold-Resistant, Fire-Resistant Gypsum Board [Type GB-5]:
   1. Core: mold-moisture resistant core and surfaces
   2. Type X fire resistant type, high density
   3. Thickness: 5/8 inch
   4. Mold Resistance: ASTM D 3273, score of 10 according to ASTM D 3274.

F. Non-Paper Faced, Fire-Resistant Gypsum Board [Type GB-6]:
   1. Core: mold-moisture resistant core and surfaces
   2. Facer: fiberglass matt facer laminated to both sides, designed for interior use.
   3. Type X fire resistant type, high density
   4. Thickness: 5/8 inch
   5. Mold Resistance: ASTM D 3273, score of 10 according to ASTM D 3274.

G. Abuse-Resistant Gypsum Board [Type GB-7]: Level 1
   1. Thickness: 5/8 inch
   2. Surface Abrasion: ASTM C1629, meets or exceeds Level 2 requirements.
   3. Indentation: ASTM C1629, meets or exceeds Level 1 requirements.
   4. Soft-Body Impact: ASTM C1629, meets or exceeds Level 1 requirements.

H. Impact-Resistant Gypsum Board [Type GB-8]: Level 2
   1. Thickness: 5/8 inch
   2. Surface Abrasion: ASTM C 1629, meets or exceeds Level 2 requirements.
   3. Indentation: ASTM C 1629, meets or exceeds Level 1 requirements.
   4. Soft-Body Impact: ASTM C 1629, meets or exceeds Level 3 requirements.
   5. Hard-Body Impact: ASTM C 1629, meets or exceeds Level 2 requirements.

2.3 CEMENTITIOUS BACKER BOARDS

A. Tile / Shower Backer Boards [Type TB-1]:
   1. ASTM A118.9; high density, glass fiber reinforced; ends and edges cut square and finished smooth; formed in a continuous process of aggregated Portland-cement slurry, and reinforced with vinyl coated, woven glass-fiber mesh embedded in both surfaces.
   2. Thickness: 1/2 inch
   3. Mold Resistance: ASTM D 3273, score of 10 according to ASTM D 3274.

B. Tile Backer Board Joint Tape: 2 inch wide, coated glass fiber tape for joints and corners.

2.4 ACCESSORIES

A. Gypsum Board Accessories: ASTM C 1047; metal, metal and paper combination; corner beads, edge trim, and expansion joints.
   1. Metal Accessories: Galvanized steel.
   2. Edge Trim: Type LC or U bead.

B. Joint Materials: ASTM C475/C475M, reinforcing tape, joint compound, and water.

C. Joint Compound for Interior Gypsum Wallboard: For each coat use formulation that is compatible with other compounds applied on previous or for successive coats. Pre-mixed compounds shall be free of antifreeze, vinyl adhesives, preservatives, biocides, and other slow releasing

compound. All-purpose type compound will not be acceptable for prefilling, embedding, first coat, or fill coat.

D. Joint Compound for Cementitious Backer Board: Material recommended by cementitious backer unit manufacturer.

E. Fasteners: ASTM C1002; Type S12 hardened screws, length to suit application.

F. Gypsum Board Screws: ASTM C1002; Type W or S hardened screws, length to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify site conditions are ready to receive work.

3.2 INSTALLATION

A. Gypsum Board:
   1. Install gypsum board in accordance with GA-216 and GA-600.
   2. Fasten gypsum board to furring or framing with screws.
   3. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.
   4. Seal cut edges and holes in moisture resistant gypsum board with sealant.

B. Levels of Finish: The following levels of finish are established as a guide for specific final finishes in accordance with GA-214 and ASTM C840, for locations as indicated.
   1. Level 1: Joints and interior angles shall have tape embedded in joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable.
      a. This finish level shall be used in plenum areas above ceilings, in attics, and in areas where the assembly is concealed.
      b. Where a fire-resistance rating is required for the gypsum board assembly, details of construction shall be in accordance with reports of fire tests of assemblies that have met the fire-rating requirement. Tape and fastener heads need not be covered with joint compound.
   2. Level 2: All joints and interior angles shall have tape embedded in joint compound and wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Fastener heads and accessories shall be covered with a coat of joint compound. Surface shall be free of excess joint compound. Tool marks and ridges are acceptable. Joint compound applied over the body of the tape at the time of tape embedment shall be considered a separate coat of joint compound and shall satisfy the conditions of this level.
      a. This level may be used as a substrate for tile.
   3. Level 3: Not Used.
   4. Level 4: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener head and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges.
      a. This level is to be used at areas to receive flat paints are to be applied typically only horizontal surfaces.
   5. Level 5: All joints and interior angles shall have tape embedded in joint compound and shall be immediately wiped with a joint knife leaving a thin coating of joint compound over all joints and interior angles. Two separate coats of joint compound shall be applied over all flat joints and one separate coat of joint compound shall be applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. A thin skim coat of joint compound trowel applied, or a material manufactured especially for this

purpose and applied in accordance with manufacturer's recommendations, applied to the entire surface. The surface shall be smooth and free of tool marks and ridges.

a. This level is to be used at areas to receive eggshell and semi-gloss and gloss paint and areas subject to severe lighting, where indicated.

C. Level of Finishes:
1. Unless noted otherwise, provide Level 4 Finish at all gypsum board finishes.
2. Provide Level 5 finish at areas receiving tile backer board or non-paper faced gypsum board.
3. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
4. Feather coats onto adjoining surfaces so camber is maximum 1/32 inch.

3.3 SCHEDULE [COORDINATE WITH DRAWINGS AS APPLICABLE]

General: Match existing / adjacent finishes as applicable to the conditions. General intent is skim coat and repair existing gypsum board finishes to a Level 4 standard finish. Prep, repair, and skim as required to achieve desired finish. Scrape / skim coat or overlay any existing textured / stomped ceilings to provide a smooth, Level 4 standard finish.

A. Interior walls [except where noted otherwise]: GB-1. Level 4 finish.

B. Interior Demising Walls: GB-4 [GB-5 where applicable]. Level 4 Finish.

C. Interior Ceilings: GB-1. Level 4 finish.

D. Interior Walls at “Wet” Areas in Kitchens, Bathrooms, Laundry Rooms as defined on Drawings: GB-2 and GB-3. Level 4 Finish at GB-2 and Level 5 Finish at GB-3.

E. Interior Ceilings at “Wet” Areas in Kitchens, Bathrooms, Laundry Rooms as defined on Drawings: GB-2 and GB-3. Level 4 Finish at GB-2 and Level 5 Finish at GB-3.

F. Interior walls to receive tile / solid surface finishes: TB-1 or GB-2 / GB-3 as applicable and per manufacturer installation instructions.

END OF SECTION

SECTION 09 22 16 - NON-STRUCTURAL METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Metal stud framing and accessories.

1.2 QUALITY ASSURANCE

A. Perform Work according to ASTM C754, NAAMM ML/SFA 540.

B. Form, fabricate, install, and connect components according to NAAMM ML/SFA 540.

C. Furnish framing materials according to SSMA - Product Technical Information.

PART 2 PRODUCTS

2.1 COMPONENTS

A. Studs: ASTM A653, non-load bearing rolled steel, channel shaped, punched for utility access
   1. Depth: match existing.
   2. Thickness: 20 gauge unless otherwise noted.

B. Tracks and Headers: Same material and thickness as studs, bent leg retainer notched to receive studs.

C. Furring and Bracing Members: Of same material as studs; thickness to suit purpose.

D. Fasteners: ASTM C1002; Type S, GA-216; length to suit application.

2.2 SHOP FINISHING

A. Studs, Tracks, Furring: Galvanized.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify rough-in utilities are in proper location.

3.2 INSTALLATION

A. Repair existing metal stud framing to match original condition in like kind as applicable to the work.

END OF SECTION

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SECTION 09 26 13 - GYPSUM VENEER PLASTERING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Veneer plaster / Skim coat over existing plaster or gypsum board surfaces.

1.2 SUBMITTALS

A. Product Data: Veneer plaster products.

1.3 QUALITY ASSURANCE

A. Apply gypsum base according to ASTM C844 and GA 216.

B. Apply gypsum veneer plaster according to ASTM C843.

C. Veneer plaster Work according to GA 216.

D. Fire-Rated Wall and Floor Construction: in conjunction with Section 09 21 16 and the drawings.

E. Manufacturer: Company specializing in manufacturing products specified in this Section with three years' experience.

F. Installer: Company specializing in performing Work of this Section with three years' experience.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Do not apply veneer plaster when substrate or ambient air temperature is less than 50 degrees F nor more than 80 degrees F; for 24 hours prior to, during operations and after, until building heating system can maintain spaces above minimum temperature.

PART 2 PRODUCTS

2.1 GYPSUM VENEER PLASTER

A. Manufacturers:
   1. USG
   2. Georgia Pacific
   3. National Gypsum

2.2 COMPONENTS

A. Gypsum Veneer Plaster: ASTM C587.

B. Gypsum Base: Refer to Section 09 21 16 for gypsum board base materials.

C. Gypsum Veneer Base Accessories: ASTM C1047; metal; corner beads, edge trim, and expansion joints.

D. Reinforcing Tape, Joint Compound, Adhesive, Water, Fasteners: GA 216.

E. Bond Coat: ASTM C631, vinyl polymer type.

2.3 ACCESSORIES

A. Gypsum Board Screws: ASTM C954; length to suit application.
   1. Screws for Wood Framing: Type W.

2.4 MIXES

A. Mix plaster according to ASTM C587.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify gypsum base is flat, joints are taped and sanded, and surface is ready to receive Work of this Section. Verify joint and surface perimeter accessories are in place.

B. Verify gypsum plaster base has been installed according to ASTM C844, is flat, smooth and surface is ready to receive Work. Verify joint and surface perimeter accessories are in place.

3.2 PREPARATION

A. Clean surfaces of dust or loose matter.

3.3 INSTALLATION

A. Install gypsum base according to GA 216. Refer to Section 09 21 16.

B. Use drywall screws to fasten gypsum board to framing substrate.

C. Install accessories.

D. Tape, fill, and sand filled joints, edges, corners, openings, and fixings to produce surface ready to receive veneer finish.

E. Feather coats onto adjoining surfaces so joint camber is maximum 1/32 inch.

F. Apply gypsum veneer plaster according to ASTM C843.

G. Apply single coat of veneer plaster immediately after dampening substrate to thickness of 1/16 to 3/16 inch in thickness or as required to suit existing conditions.

H. Finish surface of veneer plaster to **smooth skim coat finish to match new adjacent gypsum board finishes.**.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Specified Thickness: Plus or minus 1/32 inch.

3.5 SCHEDULES

A. Where existing plaster/ gypsum board finishes are scheduled to remain, repair walls from prior damage and as a result of cut-patch operations for proposed work. Apply new full skim coat gypsum veneer skim coat over the entire surface of the existing finishes scheduled to remain where impacted by the work. New finish shall be smooth and consistent with the finish of new gypsum board, Level 4 finish.

END OF SECTION

SECTION 09 30 00 - TILING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes porcelain tile, ceramic tile for interior floor and wall applications; metal edge and transition strips, and thresholds at door openings.

1.2 SUBMITTALS

A. Product Data: Submit product data for each type of tile, grout, and accessories.

B. Shop Drawings: Indicate patterned applications and thresholds.

C. Samples: Submit [2] samples of each tile and grout, illustrating pattern, color variations, and grout joint size variations.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.4 QUALITY ASSURANCE

A. Perform Work in accordance with TCA Handbook and ANSI A108.1 Series/A118.1 Series.

B. Manufacturer: Company specializing in manufacturing products specified in this section with minimum five years documented experience.

C. Installer: Company specializing in performing Work of this section with minimum five years documented experience and approved by manufacturer.

1.5 MOCKUP

A. Build mockup, in place, to verify installation details and techniques. Mockup once approved by Architect and Owner shall remain in place and will be used as the benchmark for remaining installations.

1.6 ADDITIONAL MATERIALS

A. Furnish extra materials that match and are from the same production runs as the products installed. Package with protective covering for storage.
   1. Tile: Furnish tile and accessories in the amount of 5% for each type.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in unventilated environment.

B. Maintain ambient and substrate temperature of 50 degrees F during installation of mortar materials.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.

B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.

D. Store liquid latexes and emulsion adhesives in unopened containers and protected from freezing.

E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.9 ALLOWANCE

A. Allow $8.00/sf for the purchase of the tile excluding all accessories and installation.

PART 2 PRODUCTS

2.1 PRODUCTS – GENERAL

A. ANSI Ceramic Tile Standard: Provide Standard-grade tile that complies with ANSI A137.1 for types, compositions, and other characteristics indicated.

B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced in other Part 2 articles, ANSI standards referenced by TCNA installation methods specified in tile installation schedules, and other requirements specified.

C. Source Limitation for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from single manufacturer and each aggregate from single source or producer.
   1. Obtain setting and grouting materials, except for unmodified Portland cement and aggregates, from single manufacturer.

D. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1/.2, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
   1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
   2. For facial dimensions of tile, comply with requirements relating to tile sizes specified.

E. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI A108.02, ANSI standards referenced, ANSI standards referenced by TCNA installation methods specified in tile installation scheduled and other requirements specified.

F. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.

2.2 TILE PRODUCTS

A. Manufacturer:
   1. DalTile
   2. American Olean Tile
   3. Crossville Porcelain Stone
   4. Florida Tile
   5. Equal

2.3 WATERPROOFING AND CRACK-SUPPRESSION MEMBRANES FOR THIN-SET TILE INSTALLATIONS

A. General: Manufacturer's product selected from the following, that complies with ANSI A118.10 and A118.12 for high (greater than 1/8 inch) performance and is recommended by the manufacturer for the application indicated. include reinforcement and accessories recommended by manufacturer.
   1. Chlorinated-Polyethylene Sheet Product
   2. PVC-Sheet Product
   3. Fabric Reinforced, Fluid Applied Membrane

2.4 CRACK-ISOLATION MEMBRANE

A. Manufacturer’s product selected that complies with A 118.12 for high (greater than 1/8 inch) performance and is recommended by the manufacturer for the application indicated.
   1. Fabric Reinforced, Fluid Applied Membrane
   2. Fluid Applied Membrane

2.5 WATERPROOFING ONLY MEMBRANES FOR TILE INSTALLATIONS

A. General: Manufacturer's standard product, selected from the following that complies with ANSI A118.10 and is recommended by the manufacturer for the application indicated. Include reinforcement and accessories recommended by manufacturer.
   1. Provide waterproofing at showers that do not have a prefabricated receptor.
      a. Chlorinated Polyethylene Sheet
      b. PVC Sheet
      c. Polyethylene Sheet
      d. Fabric Reinforced Fluid Applied Membrane
      e. Fluid Applied Membrane

2.6 SETTING AND GROUTING MATERIALS

A. Products: Subject to compliance with requirements, provide one of the following:
   1. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15
      a. MAPEI Corporation; Kerabond T/Keralastic System
      b. LATICRETE SUPERCAP, LLC; 4-XLT
   2. Polymer-Modified, Unsanded Tile Grout: ANSI A118.7 and ISO 13007; CG2WA
      a. MAPEI; Keracolor U
      b. Laticrete; 600 Series/LATICRETE 1776
   3. Polymer-Modified, Sanded Tile Grouts: ANSI A118.7 and ISO 13007; CG2WA
      a. MAPEI, Keracolor S
      b. Laticrete: Laticrete 1500 Sanded Grout; Laticrete 1776 Grout Admix Plus

B. Mortar Bed Materials: ANSI A108.1A; Portland cement, sand, latex additive and water.
   1. Create mortar bed to accommodate difference in thickness of original floor materials and new floor materials.

C. Improved Modified Dry-Set Mortar (Thinset): ANSI A118.15.
   1. Provide prepackaged, dry-mortar mix containing dry, redispersible, vinyl acetate or acrylic additive to which only water must be added to Project site.
   2. For wall applications, provide mortar that complies with requirements for nonsagging mortar in addition to other requirements in ANSI A118.15.

D. Polymer-Modified, High-Performance, Tile Grout: ANSI A118.7, color as indicated.
   1. Polymer Type: Acrylic resin or styrene-butadiene rubber in liquid-latex form for addition to prepackaged dry-grout mix.
      a. Unsanded grout mixture for joints 1/8 inch and narrower.
      b. Sanded grout mixture for joints 1/8 inch and wider.

2.7 MIXING MORTARS AND GROUT

A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.

B. Add materials, water, and additives in accurate proportions.

C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

2.8 ACCESSORIES AND MISCELLANEOUS MATERIALS

A. Tile Backer Board: Refer to Section 09 21 16.

B. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.

C. Metal Edge Strips, Terminations, and Transitions: Angle or L-shape, height to match tile and setting-bed thickness, metallic, designed specifically for floor and wall applications, satin

anodized aluminum; sized and profiles to suit conditions and as noted on drawings. Meet accessibility requirements for transitions at floor applications.
1. Schluter Systems or Equal

D. Temporary Protective Coating: Either product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F per ASTM D 87.
2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.

E. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.

F. Floor/Grout Sealer: Manufacturer's standard product for sealing grout joints that does not change color or appearance of grout.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions where tile will be installed for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
1. Verify substrate mix design for additives i.e. hardeners, moisture vapor reduction admixture, and other ingredients that might affect performance of installed tile.
2. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films or silicones, and curing compounds; and within flatness tolerances required by referenced ANSI A108 of tile installation standards for installations indicated.
3. Verify that concrete surfaces for tile floors installed with bonded mortar bed or thinset mortar comply with surface finish requirements in ANSI A108.1 for installations indicated.
a. Verify that surfaces that received a steel trowel finish have been mechanically scarified.
b. Verify that protrusions, bumps, and ridges have been removed by sanding or grinding.
4. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
5. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.

B. Proceed with installation only after unsatisfactory conditions have been corrected and manufacturer has approved substrate for material to be installed without compromise.

3.2 PREPARATION

A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials, using mechanical methods recommended by manufacturer. Do not use solvents.

B. Provide concrete substrates for tile floors installed with thin-set mortar that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
1. Remove protrusions, bumps, and ridges by sanding or grinding.
2. All concrete substrates at least 28 days old, completely cured and free of hydrostatic conditions.
a. If concrete additives have been included in the mix or suspected to be in the mix that might affect the performance of the flooring installation, test the bond.
1) Perform bond and additional tests as recommended by the TCNA and grout manufacturer. If tests do not produce satisfactory results, coordinate with concrete

admixture manufacturer and grout manufacturer on possible solutions. Retest until a satisfactory result can be obtained.

C. Fill cracks, holes, and depressions in concrete substrates for tile floors installed with adhesives or thinset mortar with trowelable leveling and patching compound specifically recommended by tile-setting material manufacturer.

D. Mortar Bed: Create mortar bed for setting of new floor tile to accommodate difference in thickness between existing finish floor and proposed finish floor. Field verify existing conditions.

E. Wall Preparation: Comply with ANSI A108.01, Section 2.5.

F. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.

G. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 WATERPROOFING INSTALLATION

A. Install waterproofing to comply with ANSI A108.13 and waterproofing manufacturer's written instructions to produce waterproof membrane of uniform thickness bonded securely to substrate.
   1. Shower pan membranes shall extend 3 inches minimum above finished floor to form pan, unless otherwise noted.
   2. Materials adversely affected by moisture in areas immediately adjacent to showers or tubs shall be properly protected.
   3. All horizontal surfaces, for example shower seats, sills, curbs, etc. must slope towards drain or other surfaces sloped toward drain. Waterproofing must also be sloped.

B. Do not install tile over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.4 CRACK ISOLATION MEMBRANE INSTALLATION

A. Install crack-suppression membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness bonded securely to substrate.
   1. Crack-suspension membrane must be installed over entire substrate.

B. Allow crack isolation membrane to cure before installing tile or setting materials over it.

3.5 GENERAL INSTALLATION

A. Install tile and grout in accordance with applicable requirements of ANSI A108.1 through A108.10, and TCA Handbook recommendations.

B. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor, base and wall joints to the extent possible

C. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated on drawings. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
   1. For tile mounted in sheets, make joints between tile sheets same width as joints within tile sheets so joints between sheets are not apparent in finished work.
   2. Where tiles are specified or indicated to be whole integer multiple of adjoining tiles on floor, base, walls, or trim, align joints unless otherwise indicated.
   3. Where adjoining tiles on floor, base, walls, or trim are specified or indicated to be same size, align joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

3.6 ADJUSTING/CLEANING AND PROTECTING

A. Remove and replace tile that is damaged or that does not match adjoining tile. Provide new matching units, installed as specified and in a manner to eliminate evidence of replacement.

B. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
   1. Remove latex-portland cement grout residue from tile as soon as possible.
   2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
   3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.

C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.

3.7 FLOOR TILE INSTALLATION

A. General: Install tile to comply with requirements in the Floor Tile Installation Schedule, including those referencing TCNA installation methods and ANSI A108 Series of tile installation standards.

B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.
   1. Locate transition under doors, unless otherwise noted.

C. Floor/Grout Sealer: Apply grout sealer to cementitious grout joints according to grout-sealer manufacturer's written instructions. As soon as grout sealer has penetrated grout joints,
   1. remove excess sealer and sealer that has gotten on tile faces by wiping with soft cloth.

3.8 WALL TILE INSTALLATION

A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCNA installation methods and ANSI setting bed standards.

B. Metal Edge Strips: Install at locations indicated or where exposed edge of tile flooring meets carpet, wood, or other flooring that finishes flush with top of tile.
   1. Locate transition at corners and where indicated on drawings.

3.9 INTERIOR, FLOOR TILE INSTALLATION SCHEDULE

A. Interior Floor Installations, Concrete Subfloor
   1. Tile Installation: Interior floor installation on concrete; thin-set mortar; TCNA F113 (on-ground concrete) TCNA F113A (above-ground concrete) and ANSI A108.5.
      a. Tile Type: Unglazed ceramic mosaic tile.
      b. Thin-Set Mortar: Improved modified dry-set mortar.
      c. Grout: polymer-modified, high-performance unsanded grout.
   2. Tile Installation: Interior floor installation on waterproof membrane over concrete; thin-set mortar; TCNA F122A (elevated slabs) and ANSI A108.13.
      a. Tile Type: Unglazed ceramic mosaic tile.
      b. Thin-Set Mortar: Improved modified dry-set mortar.
      c. Grout: Polymer-modified, high-performance, unsanded grout.
   3. Tile Installation: Interior floor installation on concrete; thin-set mortar on crack isolation membrane; TCNA F125-Full and ANSI A108.1.

a. Tile Type: Unglazed paver tile.
b. Thin-Set Mortar: Improved modified dry-set mortar.
c. Waterproofing and Crack Suppression Membrane Installed: Full coverage of substrate.
d. Grout: Polymer-modified, high-performance, sanded grout.

3.10 INTERIOR, WALL (BASE) TILE INSTALLATION SCHEDULE

A. Interior Wall Installations, Masonry or Concrete
1. Tile Installation: Interior wall installation over sound, dimensionally stable masonry or concrete; thin-set mortar; TCNA W202I and ANSI A108.5.
a. Tile Type: Unglazed ceramic mosaic and glazed wall tile.
b. Thin-Set Mortar: Improved modified dry-set mortar.
c. Grout: Polymer-modified, high-performance, unsanded grout.

B. Interior Wall Installations, Metal Studs or Furring:
1. Tile Installation: Interior wall installation over glass-mat, water-resistant backer board; thin-set mortar; TCNA W245 or W248 and ANSI A108.5.
a. Tile Type: Unglazed ceramic mosaic and glazed wall tile.
b. Thin-Set Mortar: Improved modified dry-set mortar.
c. Grout: Polymer-modified, high-performance, unsanded grout.

END OF SECTION

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SECTION 09 64 00 - RESILIENT WOOD FLOORING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes resilient plank flooring – direct glue down.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's product data.

B. Samples:
   1. Submit manufacturer's complete set of color samples for initial selection.

1.3 QUALITY ASSURANCE

A. Surface Burning Characteristics:
   1. Floor Finishes: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature in storage area between 55 degrees F and 85 degrees F.

B. Store materials for not less than 48 hours prior to installation in area of installation at temperature of 65 degrees F to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F. Maintain relative humidity between 40% and 60% during installation.

1.5 PERFORMANCE REQUIREMENTS

A. Fire-Test-Response Characteristics: For resilient tile flooring, as determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.6 EXTRA MATERIALS

A. Furnish an additional 5% of each type of floor, base and accessories.

B. Document attic stock, properly label, and turn over to Owner.

1.7 WARRANTY

A. Furnish twenty [20] year warranty on Vinyl Plank Flooring.

PART 2 PRODUCTS

2.1 VINYL PLANK FLOORING

A. Manufacturers:
   1. Six Degrees, Radius LVP, Woodland RP330_CO02

B. Vinyl Plank Flooring: ASTM F1066:
   1. Tile Standard: ASTM F 1700, Class III, Type B, printed film vinyl tile, embossed surface
   2. Size: 7 x 48 inch.
   3. Wear Layer Thickness: 12 mil
   4. Total Thickness: 3 mm
   5. Surface Treatment: Polyurethane
   6. Installation Method: Glue Down
   7. Pattern: Surface woodgrain pattern, as selected from full range of manufacturers colors.

2.2 ACCESSORIES

A. Subfloor Filler: Premix latex; type recommended by floor material manufacturer.

B. Primers and Adhesives: Waterproof, types recommended by floor material manufacturer.

C. Nosings: Provide integral stair nosing profiles at all locations where steps are located.

D. Moldings and Edge Strips: Same material as flooring as applicable, molded rubber other locations.

E. Sealer and Wax: Types recommended by floor material manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. All subfloors must be permanently dry, clean, smooth, and structurally sound. The surface must be free of all dust, loose particles, solvents, paint, grease, oil, wax, alkali, sealing/curing compounds, old adhesive, and any other foreign material, which could affect the installation and adhesive bond to the substrate. Permanent and non-permanent markers, pens, crayons, paint, or similar marking tools used to mark the substrate or the back of the resilient flooring material will cause migratory staining. All substrate contaminants must be mechanically removed prior to the installation of the flooring material. NOTE: Do not use liquid solvents or adhesive removers.

B. Verify concrete floors are dry to maximum moisture content as recommended by manufacturer, and exhibit negative alkalinity, carbonization, and dusting.

C. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.

3.2 PREPARATION

A. Clean substrate.

B. Fill minor low spots and other defects with sub-floor filler.

C. Repair concrete surfaces in accordance with ASTM F 710.

D. Wood subfloors shall have a 1/4 or 1/2 inch APA approved underlayment plywood.

E. Fill cracks, holes, depressions and irregularities in the substrate with good quality Portland cement based underlayment leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

F. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed. Apply primer to substrate surfaces per manufacturer.

3.3 INSTALLATION

A. Layout flooring planks in accordance with manufacturer’s recommendations. Set flooring in place. Bond planks together, and floating over subfloor.

B. Install tile flooring with joints and seams parallel to building lines.

C. Scribe flooring to produce tight joints at items penetrating flooring.

D. Where floor finishes are different on opposite sides of door, terminate flooring under centerline of door.

E. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated. Secure resilient strips by adhesive.

F. Adhere base tight to wall and floor surfaces.

G. Fit joints tightly and make vertical. Miter internal corners. At external corners, V cut back of base strip to 2/3 of its thickness and fold.

3.4 CLEANING

A. Remove excess adhesive from surfaces without damage.

3.5 SCHEDULE

A. Vinyl Plank Flooring: at areas identified on the drawings.

END OF SECTION

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SECTION 09 65 13 - RESILIENT BASE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes resilient [vinyl] base, thresholds, and resilient stair accessories.

1.2 REFERENCES

A. ASTM International:
   1. ASTM F1344 - Standard Specification for Rubber Floor Tile.
   2. ASTM F1861 - Standard Specification for Resilient Wall Base.

B. National Fire Protection Association:
   1. NFPA 253 - Standard Method of Test for Critical Radiant Flux for Floor Covering Systems Using a Radiant Heat Energy Source.

C. South Coast Air Quality Management District:
   1. SCAQMD Rule 1113 - Architectural Coatings.
   2. SCAQMD Rule 1168 - Adhesive and Sealant Applications.

1.3 SUBMITTALS

A. Product Data: Submit data describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

B. Samples:
   1. Submit manufacturer's complete set of color samples for initial selection.
   2. Submit three samples, 2x2 inch in size illustrating color and pattern for each resilient flooring product specified.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit maintenance instruction and data.

1.5 QUALITY ASSURANCE

A. Surface Burning Characteristics:
   1. Base Material: Class I, minimum 0.45 watts/sq cm when tested in accordance with NFPA 253.

B. Accessibility: Base shall comply with accessibility requirements ICC/ANSI A117.1.
   1. Exceed Federal Standards and ADA requirements for slip-resistance.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing products specified in this section with minimum ten years documented experience.
   1. Manufacturers Qualifications: Product manufacturer will have a technical installation representative available at the job site at the start of the installation to insure there are no conditions which will compromise the installation of the material and that the material is being installed according to industry standards, practices and manufacturers guidelines. The manufacturer’s technical representative will document and confirm that the substrate, material, and installation are in compliance with manufacturer’s guidelines and accepted industry standards and practices.
   2. Any noticed defect with the product or installation system will require the response of the manufacturer’s technical field service personnel on site to determine cause, correction or replacement.

B. Installer: Company specializing in performing Work of this section with minimum ten years documented experience.
   1. An installer is “qualified” if trained by the manufacturer or a certified INSTALL [International Standards and Training Alliance] resilient covering installer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 85 deg F (29 deg C).

1.8 PROJECT CONDITIONS / ENVIRONMENTAL REQUIREMENTS

A. Install resilient products after other finishing operations, including painting, have been completed. If that is not possible due to the compressed schedule, provide all required protection of the floor system after installation until turnover of the space.

B. Maintain ambient temperatures within range recommended by the manufacturer, but not less than 65 deg F or more than 85 deg F in spaces to receive resilient products during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

C. Maintain the ambient relative humidity between 40% and 60% during installation.

D. Until Substantial Completion, maintain ambient temperatures within range recommended by the manufacturer, but not less than 55 deg F or more than 85 deg F.

1.9 EXTRA MATERIALS

A. Furnish an additional 5% of each type of floor, base and accessories.

B. Document attic stock, properly label, and turn over to Owner.

1.10 WARRANTY

A. Provide five [5] year manufacturer warranty for all resilient flooring, base, and accessories.

PART 2 PRODUCTS

2.1 RESILIENT BASE

A. Manufacturers:
   1. Johnsonite
   2. Roppe Corp.
   3. Approved Equal

B. Base: ASTM F1861; Type TV, Type 1, Vinyl; top set coved:
   1. Height: 4 inch.
   2. Thickness: 0.125 inch thick.
   3. Length: 4 foot sections
   4. Finish: Matte.
   5. Outside Corners: Job formed.
   6. Inside Corners: Job formed

2.2 STAIR COVERING

A. Manufacturers:
   1. Johnsonite Vinyl Stair Tread Covers [Basis of Design]
   2. Must be the same manufacturer as rubber flooring system.

B. Vinyl Stair Treads: ASTM F 2169, Type TV, Class 2, Group 1, full width and depth of stair tread in one piece; tapered thickness; nosing not less than 2 inches deep.
   1. Nominal Thickness: 5/32 inch.
   2. Nosing Style: Square or round to match stair riser condition.
   3. Nosing Strip: contrasting color strip to lineate edge of stair tread.
   4. Colors: As selected by Architect / Owner from full range of colors..
   5. Surface Pattern: Hammered or as directed by Owner.

C. Stair Risers: Maintain height and length in one piece, matching treads in material and color:
   1. Thickness: 0.125 inch.

2.3 ACCESSORIES

A. Transition Moldings and Edge Strips, same material as flooring or metal as applicable. Refer to drawings.

B. Primers and Adhesives: Waterproof, types recommended by floor material manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

A. Clean substrate.

B. Apply primer as required to prevent "bleed-thru" or interference with adhesion by substances that cannot be removed.

3.2 INSTALLATION

A. Adhere base tight to wall and floor surfaces.

B. Adhere stair tread covers to stair treads in one piece.

C. Fit joints tightly and make vertical. Miter internal corners. Install pre-molded interior and exterior corners.

D. Remove excess adhesive from surfaces without damage.

END OF SECTION

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SECTION 09 90 00 - PAINTING AND COATING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes surface preparation and field application of paints and other coatings.

B. Paint/Stain all exposed surfaces, new and existing, unless otherwise indicated.
   1. Exterior Work:
      a. Exterior Doors and Frames.
      b. Miscellaneous exterior trim.
      c. Steel Lintels
   2. Interior Work
      a. Basement Concrete / CMU Walls.
      b. Walls and ceilings.
      c. Interior trim and casing
      d. Doors and frames.
      e. Shelving and miscellaneous components.

C. Do not paint prefinished items, finished metal surfaces, operating parts, labels, and materials obviously intended to be left exposed such as brick and tile.

D. Unless otherwise indicated do not paint concealed surfaces.

E. Obtain primers and undercoat materials for each coating system from the same manufacturer as the finish coats. Primer and finish coat shall be factory applied, finish coat shall be field applied.

F. **Extra Materials**: Deliver to Owner **any extra materials**, properly labeled, factory sealed, of each color and type of finish coat paint used on project for each building in contract.

G. Minimum surface temperature of 50 degrees required for all coating systems.

H. Store all materials in tightly closed containers when not in use, away from heat, electrical equipment, sparks and open flames. Use approved bonding and grounding procedures. Keep out of the reach of children and residents.

I. Transfer materials to approved containers with complete and appropriate labeling.

1.2 APPLICATORS QUALIFICATIONS

A. Engage an experienced applicator with a minimum of five years experience and who has completed painting systems application similar in materials and extend to those indicated for the Project and that have resulted in a construction record of successful in-service performance.

1.3 SUBMITTALS

A. Product Data and Color Samples: Provide product data on each coating system component indicating VOC and environmental requirements. Coordinate coating systems for each material/substrate.

1.4 REFERENCES AND REGULATIONS:

A. Standards: Comply with applicable provisions and recommendations of the following, except when otherwise shown or specified:
   1. OSHA Safety Standards for the Construction Industry, Title 29 - Labor, Subtitle B – Regulations Relating to Labor, Occupational Safety and Health Administration (OSHA) 1926, 07/01/93 editions.
   2. OSHA Worker Safety and Health Act Regulation 29 CFR No. Parts 1900 through 1910.1400, 07/01/93 and later editions.

3. SSPC Volume 1, Good Painting Practice, 1989 edition.
4. SSPC Volume 2, Systems and Specifications, 1991 edition, Surface Preparation Guide and Paint Application Specifications of the Steel Structures Painting Council.
5. NACE Standards, Volume I and II, 1992 editions of the National Association of Corrosion Engineers.
6. SSPC and NACE Painter Safety Guidelines, latest editions.

B. Requirements of Regulatory Agencies, conform with the following:
1. Clean Air Act (CAA) – hazardous Air Emissions by U.S. EPA or State Agency under Regulation 40 CFR 61 or state equivalent.
2. Clean Water Act (CWA) – hazardous Water Releases by U.S. EPA or State Agency under Regulation 40 CFR 116 through 117 or state equivalent.
3. Toxic Substances Control Act (TSCA) – Toxic substance by U.S. EPA under Regulation 40 CFR 761.
4. Comprehensive Environmental Response, Compensation and Liability Act (CERCLA or “SuperFund”) – Uncontrolled Hazardous Waste Sites and Hazardous Substance Release by U.S. EPA under Regulation 40 CFR 302.
5. Resource Conservation and Recovery Act (RCRA) – Generation, Transportation, Treatment, Storage and Disposal of hazardous waste by U.S. EPA or State Agency under Regulation 40 CFR 260 through 267 or state equivalent.
6. Hazardous and Solid Waste Amendments (HSWA) – Further regulation of hazardous waste by U.S. EPA or State Agency under Regulation 40 CFR through 267 or state equivalent.
7. Hazardous Material Transportation Act (HMTA) – Transportation of Hazardous Material by DOT or State Agency under Regulation 49 CFR 171 through 179 or state equivalent.

1.5 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit maintenance and cleaning instructions.

1.6 QUALITY ASSURANCE

A. Surface Burning Characteristics:
1. Fire Retardant Finishes: Maximum 25/450 flame spread/smoke developed index when tested in accordance with ASTM E84.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver manufacturer's unopened containers to the work site. Packaging shall bear the manufacturer’s name, label, and the following list of information:
1. Product name and type (description)
2. Application & use instructions
3. Surface preparation
4. VOC content
5. Environmental handling and an SDS
6. Batch date
7. Color number

B. Storage: Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction. Store materials in an area that is within the acceptable temperature range, per manufacturer’s instructions. Protect from freezing.

C. Handling: Maintain a clean, dry storage area to prevent contamination or damage to the coatings.

1.9 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

1.10 MOCKUP

A. Apply benchmark samples of each paint system indicated and each color and finish selected to verify preliminary selections and demonstrate aesthetic effects and set quality standards for materials and execution.

PART 2 PRODUCTS

2.1 PAINT AND COATINGS

A. Manufacturer
   1. Sherwin-Williams (SW) – Basis of Design
   2. PPG Porter
   3. Benjamin Moore

B. Paints and Coatings - General:
   1. Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOCs need to be confirmed by using the products EDS sheets.

C. Primers:
   1. Where the manufacturer offers options on primers for a particular substrate, use primer categorized as "best" by the manufacturer.

D. Coating Application Accessories:
   1. Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacturer’s specifications.

E. Colors: As selected from a full range of manufacturer’s offerings, including premium colors.

F. Color Pigments: Pure, non-fading, applicable types to suit substrates and service indicated.
   1. Lead: Measurable lead content in either the pigment or binder will not be permitted.
   2. The finish coats shall match colors selected.

G. Finish Quality:
   1. Finishes shall exhibit a high quality, commercial grade appearance of uniform thickness.
   2. Finishes shall be free of runs, sags, drips, waves, orange peel, festoons, dry spray, cloudiness, spotting, ropiness, brush marks, roller marks, fish eyes or other surface imperfections, voids, discontinuities, pinholes, holidays and overspray.
   3. Final coat shall be uniform in texture, color and gloss, and shall provide an acceptable match with the approved drawdown sample sheet.

H. Provide for a <u>minimum</u> of the following:
   1. Exterior Finishes: 3 colors [allow for different colors at different buildings]
   2. Interior Finishes: 4 colors – ceiling, walls, accent wall, and trim

2.2 EXTERIOR PAINT APPLICATION SCHEDULE

General: All coatings shall be applied according to manufacturer's application instructions, including application rates for wet film and dry film thickness.

A. Metals - Ferrous: [Semi-Gloss Finish]
   1. 1st Coat: S-W Pro-Industrial Pro-Cryl Primer [as required to suit conditions]

2. 2nd Coat: S-W Waterbased Alkyd Urethane Enamel, Semi-Gloss, B53-1150/2150 Series
3. 3rd Coat: S-W Waterbased Alkyd Urethane Enamel, Semi-Gloss, B53-1150/2150 Series

B. Metals – Aluminum / Galvanized: [Semi-Gloss Finish]
1. 1st Coat: S-W Pro Industrial DTM Acrylic Primer / Finish, B66 Series
2. 2nd Coat: S-W Pro Industrial DTM Acrylic Enamel Semi-Gloss, B66 Series
3. 3rd Coat: S-W Pro Industrial DTM Acrylic Enamel Semi-Gloss, B66 Series

C. Exterior Fiber Cement Siding, Trim, Soffits / Composite Trim, etc: [Satin Finish]
1. 1st Coat: S-W Exterior Latex Wood Primer, B42W8141; S-W Loxon Concrete and Masonry Primer; or S-W Exterior Oil-Based Wood Primer [refer to S-W]
2. 2nd Coat: S-W A100 Exterior Latex Satin, A82 Series
3. 3rd Coat: S-W A100 Exterior Latex Satin, A82 Series

D. Exterior Doors and Frames [Semi-Gloss Finish]
1. 1st Coat: S-W Pro-Industrial Pro-Cryl Primer [as required to suit conditions]
2. 2nd Coat: S-W Waterbased Alkyd Urethane Enamel, Semi-Gloss, B53-1150/2150 Series
3. 3rd Coat: S-W Waterbased Alkyd Urethane Enamel, Semi-Gloss, B53-1150/2150 Series

E. Miscellaneous metals and steel lintels:
1. 1st Coat: S-W DTM Acrylic Primer/Finish.
2. 2nd Coat: S-W SW DTM Acrylic Semi-Gloss Enamel Semi-Gloss, Acrylic Coating.
3. 3rd Coat: S-W SW DTM Acrylic Semi-Gloss Enamel Semi-Gloss, Acrylic Coating.

2.3 INTERIOR PAINT APPLICATION SCHEDULE

A. Concrete / Concrete Block / CMU Basement Walls:
1. 1st Coat: UGL Drylok Wet Wall Bonding Primer
2. 2nd Coat: UGL Drylok Original Concrete and Masonry Waterproofer
3. 3rd Coat: UGL Drylok Original Concrete and Masonry Waterproofer

B. Painted Wood Trim, Trim Components, Doors, and Frames: [Semi-Gloss Finish]
1. 1st Coat: S-W Premium Wall & Wood Latex Primer, B28W8111
2. 2nd Coat: S-W ProMar® HP 200 Zero VOC Latex Semi-Gloss, B31-1900 Series
3. 3rd Coat: S-W ProMar® HP 200 Zero VOC Latex Semi-Gloss, B31-1900 Series

C. Gypsum Board Walls: [Eg-Shel/Satin Finish]
1. 1st Coat: S-W ProMar® 200 Zero VOC Latex Primer, B28W2600
2. 2nd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B20-1900
3. 3rd Coat: S-W ProMar® 200 HP Zero VOC Latex Eg-Shel, B20-1900

D. Gypsum Board Ceilings: [Flat Finish]
1. 1st Coat: S-W ProMar® 200 Zero VOC Latex Primer, B28W2600
2. 2nd Coat: S-W ProMar® 200 Zero VOC Latex Flat, B30-12600 Series
3. 3rd Coat: S-W ProMar® 200 Zero VOC Latex Flat, B30-12600 Series

2.4 PRE-CLEANING AND SURFACE PREPARATION PRODUCTS

A. Pre-cleaning Agents
1. SW No Rinse Prepaint Cleaner
2. Krud Kutter
3. Potable water

B. Pre-cleaning (Power Wash) Equipment
1. Capacity to continuously deliver 3-5 gpm at 2,500 psig of 180-200 degree F hot water.
2. Cleaning system shall affect the 32-ounce per gallon dilution.
3. Manufacturer: Alkota, Model 565T with model 520 water heater or approved equal.
4. Power wash with 15 degree tip capable of delivering hot water at 2500 psig.

C. Power Tool Surface Preparation Media:
1. Scotch Brite No. 07451 by 3 M Corporation, Surface Conditioning disc.

a. Properties
b. Texture: A Medium
c. Maximum Speed: 18,000 RPM

2. Clean ‘N" Strip Disco No CSD2 by 3 M Corporation
   a. Texture: Course
   b. Maximum Speed: 8,000 RPM
   c. Or approved equal.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin application of coatings until substrates have been properly examined and prepared. Notify Architect of unsatisfactory conditions before proceeding.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

D. Previously Painted Surfaces: Verify that existing painted surfaces do not contain lead based paints, notify Architect immediately if lead based paints are encountered.

3.2 SURFACE PREPARATION

A. Comply with paint manufacturer's written instructions for surface preparation, environmental and substrate conditions, product mixing, and application.

B. Perform all surface preparation in accordance with SSPC specifications, guidelines and good painting practices.

C. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.

D. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.

E. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion. Recognize that any surface preparation short of total removal of the old coating may compromise the service length of the system.

F. Prior to attempting to remove mildew, it is always recommended to test any cleaner on a small, inconspicuous area prior to use. Bleach and bleaching type cleaners may damage or discolor existing paint films. Bleach alternative cleaning solutions may be advised.

G. Mildew may be removed before painting by washing with a solution of 1 part liquid bleach and 3 parts water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes. Rinse thoroughly with water and allow the surface to dry before painting. Wear protective eyewear, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

H. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F, unless products are designed specifically for these conditions. On large expanses of metal siding, the air, surface and material temperatures must be 50°F or higher to use low temperature products.

I. Methods:
   1. Aluminum: Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.
   2. Block (Cinder and Concrete): Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75°F unless the manufacturer's products are designed for application prior to the 30-day period. The pH of the surface should be between 6 and 9 unless the products are designed to be used in high pH environments. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.
   3. Concrete, SSPC-SP13 or NACE 6: This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.
   4. Cement Composition Siding/Panels: Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Pressure clean, if needed, with a minimum of 2100 psi pressure to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments.
   5. Drywall—Exterior: Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting. Exterior surfaces must be spackled with exterior grade compounds.
   6. Exterior Composition Board (Hardboard): Some composition boards may exude a waxy material that must be removed with a solvent prior to coating. Whether factory primed or unprimed, exterior composition board siding (hardboard) must be cleaned thoroughly and primed with an alkyd primer.
   7. Galvanized Metal: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP16 is necessary to remove these treatments.
   8. Steel: Structural, Plate, etc.: Should be cleaned by one or more of the surface preparations described below. These methods are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Society of Protective Coatings. A brief description of these standards together with numbers by which they can be specified follow.
   9. Solvent Cleaning, SSPC-SP1: Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
   10. Hand Tool Cleaning, SSPC-SP2: Hand Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale, rust, and paint be removed by this process. Before Hand Tool Cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.
   11. Power Tool Cleaning, SSPC-SP3: Power Tool Cleaning removes all loose mill scale, loose rust, and other detrimental foreign matter. It is not intended that adherent mill scale,

rust, and paint be removed by this process. Before Power Tool Cleaning, remove visible oil, grease, soluble welding residues, and salts by the methods outlined in SSPC-SP1.

12. White Metal Blast Cleaning, SSPC-SP5 or NACE 1: A White Metal Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
13. Commercial Blast Cleaning, SSPC-SP6 or NACE 3: A Commercial Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 33 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
14. Brush-Off Blast Cleaning, SSPC-SP7 or NACE 4: A Brush-Off Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, loose mill scale, loose rust, and loose paint. Tightly adherent mill scale, rust, and paint may remain on the surface. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP 1 or other agreed upon methods.
15. Brush-Off Blast Cleaning of Coated and Uncoated Galvanized Steel, Stainless Steels, and Non-Ferrous Metals, SSPC-SP16: This standard covers the requirements for brush-off blast cleaning of uncoated or coated metal surfaces other than carbon steel by the use of abrasives. These requirements include visual verification of the end condition of the surface and materials and procedures necessary to achieve and verify the end condition. A brush-off blast cleaned non-ferrous metal surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, metal oxides (corrosion products), and other foreign matter. Intact, tightly adherent coating is permitted to remain. A coating is considered tightly adherent if it cannot be removed by lifting with a dull putty knife.
16. Power Tool Cleaning to Bare Metal, SSPC-SP11: Metallic surfaces that are prepared according to this specification, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxide corrosion products, and other foreign matter. Slight residues of rust and paint may be left in the lower portions of pits if the original surface is pitted. Prior to power tool surface preparation, remove visible deposits of oil or grease by any of the methods specified in SSPC-SP1, Solvent Cleaning, or other agreed upon methods.
17. Near-White Blast Cleaning, SSPC-SP10 or NACE 2: A Near White Blast Cleaned surface, when viewed without magnification, shall be free of all visible oil, grease, dirt, dust, mill scale, rust, paint, oxides, corrosion products, and other foreign matter, except for staining. Staining shall be limited to no more than 5 percent of each square inch of surface area and may consist of light shadows, slight streaks, or minor discoloration caused by stains of rust, stains of mill scale, or stains of previously applied paint. Before blast cleaning, visible deposits of oil or grease shall be removed by any of the methods specified in SSPC-SP1 or other agreed upon methods.
18. Water Blasting, NACE Standard RP-01-72: Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.
19. Stucco: Must be clean and free of any loose stucco. If recommended procedures for applying stucco are followed, and normal drying conditions prevail, the surface may be painted in 30 days. The pH of the surface should be between 6 and 9, unless the products are designed to be used in high pH environments such as Loxon.
20. Wood—Exterior: Must be clean and dry. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

21. Vinyl Siding, Architectural Plastics & Fiberglass or other PVC, plastic building products. Clean the surface thoroughly by scrubbing with warm, soapy water. Rinse thoroughly, prime with appropriate white primer. Do not paint vinyl with any color darker than the original color. Do not paint vinyl with a color having a Light Reflective Value (LRV) of less than 56 unless VinylSafe® Colors are used. If VinylSafe® Colors are not used and darker colors lower than an LRV of 56 are, the vinyl may warp. Follow all painting guidelines of the vinyl manufacturer when painting. Only paint properly installed vinyl siding. Deviating from the manufacturer's painting guidelines may cause the warranty to be voided.

3.3 APPLICATION

A. Examination and Verification of Condition: Contractor shall verify the areas and conditions under which the work is to be performed and notify the Owner in writing of conditions detrimental to the proper and timely completion of the Work. Do not proceed with the Work until satisfactory conditions have been corrected. Do not coat over chalk, dirt, scale, moisture, oil, surface contaminants, coatings that have exceeded the manufacturer's re-coat guidelines, or conditions otherwise detrimental to the formation of a durable high quality coating system.

B. Comply with manufacturer's instructions and SSPC Good Paint Practices Volumes 1 and 2.

C. Comply with OSHA regulations, State of Ohio and Federal laws, ordinances, and guidelines.

D. Follow manufacturer's requirements for temperature and humidity at time of application.

E. Refer to SDS sheets before using any product.

F. All surfaces must be thoroughly dry before coating applications. Do not apply to wet or damp surfaces.
   1. Wait at least 30 days before applying to new concrete or masonry or follow manufacturer's procedures to apply appropriate coatings prior to 30 days.
   2. Test new concrete for moisture content.
   3. Wait until wood is fully dry after rain or morning fog or dew.

G. Apply coatings using brush or roller only.

H. Apply all coatings and materials with the manufacturer's specifications in mind. Mix and thin coatings according to manufacturer's recommendation.

I. Apply coatings using methods recommended by manufacturer.

J. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

K. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

L. Regardless of number of coats specified, apply as many coats as necessary for complete hide.

M. Exterior Woodwork: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 2 weeks.

N. Inspection: The coated surface must be inspected and approved by the Architect or Engineer just prior to the application of each coat.

3.4 CLEAN UP

A. Clean site and remove debris and empty cans daily. Remove all paint from adjacent surfaces. Clean spills and splatters immediately.

B. Clean hands and tools immediately after use with soap and water for water based products and with mineral spirits for oil based products.

C. Follow manufacturer's safety recommendations when using mineral spirits.

3.5 ENVIRONMENTAL REQUIREMENTS

A. Store and apply materials in environmental conditions required by manufacturer's instructions.

END OF SECTION

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SECTION 10 00 00 - SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes address plaques, mailboxes

1.2 SUBMITTALS

A. Shop Drawings: Indicate component locations, dimensions, details of blocking and attachment, and anchors.

B. Product Data: Submit data on Product and accessories.

PART 2 PRODUCTS

2.1 ADDRESS PLAQUES

A. 1x composite trim with applied numbers. 4 inch numbers secured to face of composite trim. Numbers shall be contracting color to trim backup.

2.2 EXTERIOR WALL MOUNTED MAILBOXES

A. Manufacturer: Salsbury Industries, Traditional Horizontal Style Mailbox, wall mounted.

2.3 EXTERIOR POST MOUNTED RURAL MAILBOXES

A. Manufacturers: Salsbury Industries, Heavy Duty Rural Mailbox, Post Mounted unit with standard in-ground mounted Mailbox Post, or Equal.

B. Description: Aluminum construction, 1/8 inch thick extruded aluminum body with 1/8 inch thick cast aluminum front door and rear cover. Magnetic door catch, adjustable red signal flag. Size: 7.5” w x 9.5” h x 20.5” deep, Model 4850BLK or Equal. Provide address numbers on mailbox. Comply with USPS requirements.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify surfaces and internal wall blocking are ready to receive work and opening dimensions are as instructed by manufacturer.

3.2 INSTALLATION – ADDRESS PLAQUES

A. Remove existing address signage where exists.

B. Install address plaques at existing walls near location of existing address plaque to be removed. Coordinate exact location with Architect.

3.3 INSTALLATION – WALL MOUNTED MAILBOXES

A. Wall Mounted mailboxes: Comply with mailbox manufacturer’s written instructions and USPS requirements. Anchor into wall.

3.4 SCHEDULE

A. Address plaques:
   1. One at front entry door

END OF SECTION

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SECTION 10 28 00 - BATH ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes bath accessories.

1.2 SUBMITTALS

A. Product Data: Submit data on accessories describing size, finish, details of function, attachment methods.

PART 2 PRODUCTS

2.1 TOILET AND BATH ACCESSORIES

A. Manufacturers:
   1. American Specialties, Inc.
   2. Bobrick Washroom Accessories
   3. A&J Washroom Accessories
   4. Broan / Nutone

2.2 COMPONENTS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Stainless Steel Sheet: ASTM A666, Type 304.

C. Stainless Steel Tubing: ASTM A269, stainless steel.

D. Galvanized Sheet Steel: ASTM A653, G90 zinc coating.

E. Mirror Glass: Float glass, Type I, Class 1, Quality q2 (ASTM C 1036), with silvering, copper coating, and suitable protective organic coating to copper backing in accordance with FS A-A-3002.

F. Fasteners, Screws, and Bolts: Hot dip galvanized.

G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.3 ACCESSORIES

A. Grab Bar: 12-, 18, 24-, 30-, 36-, 42-, and 48- inch long grab bar. Satin finish Stainless Steel, 1-1/2 inch diameter, concealed attachment with snap flange over mounting bracket.
   1. Manufactured by ASI, #3700 Type 01.

B. Toilet Tissue Holder: Wall mounted, stainless steel, rectangular-shaped bracket and back plate for concealed attachment, satin finish.
   1. Manufactured by ASI, #7305.

C. Towel Bar 18” and 24” bar with back plate for concealed attachment, satin finish, ¾” square bar
   1. Manufactured by ASI, #7360.

D. Robe Hook: Single hook type.
   1. Manufactured by ASI, #7340.

E. Medicine Cabinet: Surface Mounted cabinet with hinged mirrored front, 16” wide x 22” high
   1. Manufactured by ASI, #8339

F. Mirror:
   1. ASTM C 1036-91 Frameless, 1/4 inch thick polished plate glass, polished edges, 18 inch wide x 36 inch high. Secured to wall with plastic clips.
   2. Manufactured by ASI, #8287

G. Standard Shower Curtain Rod:
   1. Manufactured by ASI, #1214, with concealed mounting brackets.
   2. Length: 60” +/- (cut length of opening)
   3. Corner shower Curtain Rod [match profile of shower base]

H. Shower Curtain Hooks:
   1. Manufactured by ASI, #1200-SHU

I. Folding Shower Seat:
   1. Manufactured by ASI, # 8206-R-28 [Left or Right Hand as applicable]

2.4 FACTORY FINISHING

A. Stainless Steel: **Satin finish.**

B. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats baked enamel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify exact location of accessories for installation and that blocking is in place to receive accessory.

3.2 PREPARATION

A. Deliver inserts and rough-in frames to site. Provide templates and rough-in measurements.

B. Install solid 2 x 8 (minimum) blocking behind all accessories.

3.3 INSTALLATION

A. Install plumb and level, securely and rigidly anchored to substrate.

B. Mounting Heights and Locations: As indicated on Drawings:

END OF SECTION

SECTION 11 31 00 - RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes Energy Star rated appliances: refrigerator, range with anti-tip kit, range hood and splash plates.

1.2 SUBMITTALS

A. Product Data: Submit data on equipment and accessories.

B. Manufacturer's Installation Instructions: Submit manufacturer's installation instructions.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Submit relevant instructions.

PART 2 PRODUCTS

2.1 RESIDENTIAL EQUIPMENT

A. Manufacturers:
   1. General Electric
   2. Whirlpool
   3. Maytag
   4. Hotpoint

2.2 APPLIANCES – STANDARD UNITS

A. Refrigerator: GE Model GIE18GTNRWW, 17.5 cubic feet capacity, free standing type, self defrosting, double door with freezer compartment over, upfront temperature controls, meat keeper and crisper, glass shelves, white color. Energy Star Rated.

B. Range: GE Model JB256DMWW, electric freestanding type, porcelain enamel top with four coil top burners, 5.0 cubic foot, self-cleaning oven below with top and bottom elements, with two porcelain-enameled steel racks, vision panel, interior oven light, white color.

C. Range Hood: GE JVX5305DJWW, 30” range hood, ducted, two speed with fan control, light control with [2] 15W energy efficient appliance bulbs, white color, Energy Star Rated.

D. Splash guard: Broan SP300108, 30” x 24”, white color. Locate behind range.

E. Range Fire Suppression System: Louisville Fire & Safety, Stovetop Firestop Venthood or Equal. Fire suppression powder canister, attach with magnets to underside of range hood.

F. Washer: By Resident

G. Washer Pan: Oatey 34067 Washing Machine Pan with drain connection. Install at all laundry rooms at the second floor of a unit.

H. Dryer: By Resident

2.3 APPLIANCES – ACCESSIBLE UNITS

A. Refrigerator: GE Model GTE17GTNRWW, 16.6 cubic feet capacity, free standing type, self defrosting, double door with freezer compartment over, upfront temperature controls, meat keeper and crisper, glass shelves, white color. Energy Star Rated, ADA Compliant.

B. Range: GE Model JD630DTWW, electric drop-in, glass top with four top burners with front controls, 4.4 cubic foot, self-cleaning oven below with top and bottom elements, with two porcelain-enameled steel racks, vision panel, interior oven light, white color, ADA Compliant.

C. Range Hood: GE JVX5305DJWW, 30” range hood, ducted, two speed with fan control, light control with [2] 15W energy efficient appliance bulbs, white color, Energy Star Rated.
   1. Wire to switch located on wall adjacent to range and located within accessible reach.

D. Splash guard: Broan SP300108, 30” x 24”, white color. Locate behind range.

E. Range Fire Suppression System: Louisville Fire & Safety, Stovetop Firestop Venthood or Equal. Fire suppression powder canister, attach with magnets to underside of range hood.

F. Washer: By Resident

G. Dryer: By Resident

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings and utility services are ready to receive work and opening dimensions are as indicated on shop drawings and instructed by manufacturer.

3.2 INSTALLATION

A. Appliances
   1. Set and adjust unit’s level and plumb.
   2. Connect to utilities and make units operational.
   3. Activate units to confirm correct operation.
   4. Turn refrigerators on to moderate temperature setting.
      a. Locate door handle as required. Field verify door swing.
   5. Range: Install anti-tip safety device on range.
   6. Range Hood: Recirculating type
   7. Install range splash plates, install with adhesive to wall and color match screws.

END OF SECTION

SECTION 12 20 00 - WINDOW TREATMENTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes vinyl mini-blinds and operating hardware.

1.2 SUBMITTALS

A. Product Data: Submit data indicating physical and dimensional characteristics, operating features.

B. Samples: Submit two samples illustrating slat materials and finish, color, cord type and color.

PART 2 PRODUCTS

2.1 HORIZONTAL BLINDS

A. Manufacturers:
   1. Lotus & Windoware, 1” Vinyl Cordless Blind
   2. Bali Blinds, Vinyl Blinds
   3. Hunter Douglas
   4. Levolor
   5. Equal

2.2 COMPONENTS

A. Mini Blinds: 1” cordless vinyl horizontal slat louvers hung from full-width aluminum head rail with full-width bottom rail; manual control to raise or lower, cordless lift with wand tilt blade angle adjustment.
   1. Slat Support: Woven polypropylene cord, ladder configuration.
   2. Pull Cord: None, cordless lift.
   3. Color: As selected from manufacturer’s standard colors.
   4. Roller Mechanism: Internally fitted with hardware for blind operation.
   5. Attachment Hardware: Type recommended by blind manufacturer. Brackets shall be heavy-duty type.

2.3 FABRICATION

A. Fabricate blinds to fit within openings with uniform edge clearance of 1/2 inch.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify openings are ready to receive the Work.

3.2 INSTALLATION

A. Secure in place with flush countersunk fasteners.

B. Adjust blinds for smooth operation.

C. Provide blinds at each window opening, sized to fit openings.

END OF SECTION

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SECTION 12 35 30 - RESIDENTIAL CASEWORK

PART 1 GENERAL

1.1 SUMMARY

A. Section includes shop fabricated residential cabinet units with hardware and plastic laminate counter tops for Kitchen.

1.2 SUBMITTALS

A. Shop Drawings: Indicate casework locations, scale plans, elevations and clearances required.

B. Product Data: Submit data on component profiles, sizes, assembly methods, and schedule of finishes.

C. Samples: Submit two wood samples, 2 x 2 inch in size of the final wood stain/finish selection and rings for counter top finish selection.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with KCMA (Directory of Certified Cabinet Manufacturers) - Certification Program.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Install after interior temperature and humidity are controlled and stabilized.

PART 2 PRODUCTS

2.1 KITCHEN AND BATHROOM CASEWORK

A. Manufacturer
   1. Smart Cabinets [basis of design], Brighton Door Style
   2. Quality Cabinets
   3. MasterBuilt Cabinets
   4. Evans Cabinets
   5. Equal

B. Cabinet Specification:
   1. Wood Species: Maple
   2. Door Overlay Style: Partial Overlay,
   3. Drawer Style: Solid Drawer Front
   4. Door Style: Recessed Panel Door style [exact profile as selected by Architect]
   5. Finish: Stained Finish as selected from full range of available finishes for Maple Cabinets, all exposed to view components shall be maple / maple veneer and of matching finishes.

C. Kitchen and Bathroom cabinet Construction:
   1. Traditional HUD severe use
   2. Face Frames: 3/4 inch thick solid door frames and drawer fronts
      a. 1-1/2 inch wide stiles
      b. 3 inch wide mulls
      c. 1-3/4 inch wide rails
   3. End Panels: 1/2 inch thick multi-ply hardwood plywood dadoed to receive tops and bottoms, Type 1 exterior glue
   4. Top and Bottom Panels: 1/2 inch thick multi-ply hardwood plywood
   5. Hanging Rails:
      a. Base Cabinets: 3/4 inch thick x 7-1/4 inch high multi-ply hardwood plywood running full cabinet width at top

   b. Wall Cabinets: 3/4 inch thick x 3 inch high multi-ply hardwood plywood running full cabinet width at the top and bottom
6. Back Panel: 1/4 inch thick hardwood plywood
7. Shelves: FIXED, 1/2 inch multi-ply hardwood plywood, 11 inch deep with hardwood veneer banded front edge. Shelves fixed into dadoes in end panels, typical base and wall cabinets.
8. Toe Board: 3/4 inch thick pressure treated toe board, 4 inches high
9. Base I-Beam Braces: [2] 1/2 inch thick x 3 inch wide plywood braces running full depth front to back of cabinet, recessed 1 inch from top. Glue and staple at top of cabinet to front frame and hang rail, and dadoed into end panel
10. Drawers: 5/8 inch thick solid wood front, back, and sides with dovetail construction.
11. Drawer Bottom: 1/4 inch multi-ply hardwood plywood inserved and stapled into dado in front, back, and sides
12. Drawer Guides: Epoxy coated steel, extreme grade, side mounted guides, self-adjusting in mounting brackets, built in stop, self-closing, and stay closed feature, 100 lb rated load capacity.
13. Hinges: heavy duty, high-quality, concealed 6 way adjustable hinge
14. Scribe trim, fillers, other miscellaneous panels: manufacturer supplied components of same species and finish as cabinets as required by conditions.

D. Kitchen cabinets and vanity frame/panel Construction – Accessible Units:
1. Traditional HUD severe use
2. Face Frames: 3/4 inch thick solid door frames and drawer fronts
   a. 1-1/2 inch wide stiles
   b. 3 inch wide mulls
   c. 1-3/4 inch wide rails
3. End Panels: 1/2 inch thick multi-ply hardwood plywood dadoed to receive tops and bottoms, Type 1 exterior glue
4. Top and Bottom Panels: 1/2 inch thick multi-ply hardwood plywood
5. Hanging Rails:
   a. Base Cabinets: 3/4 inch thick x 7-1/4 inch high multi-ply hardwood plywood running full cabinet width at top
   b. Wall Cabinets: 3/4 inch thick x 3 inch high multi-ply hardwood plywood running full cabinet width at the top and bottom
6. Back Panel: 1/4 inch thick hardwood plywood
7. Shelves:
   a. FIXED, 1/2 inch multi-ply hardwood plywood, 11 inch deep with hardwood veneer banded front edge. Shelves fixed into dadoes in end panels, typical base and wall cabinets.
   b. Full Depth Shelves in pantry and linen cabinets
   c. Slide out shelve tray at all base cabinets
8. Toe Board: 3/4 inch thick pressure treated toe board, 8-1/2 inches high
9. Base I-Beam Braces: [2] 1/2 inch thick x 3 inch wide plywood braces running full depth front to back of cabinet, recessed 1 inch from top. Glue and staple at top of cabinet to front frame and hang rail, and dadoed into end panel
10. Drawers: 5/8 inch thick solid wood front, back, and sides with dovetail construction.
11. Drawer Bottom: 1/4 inch multi-ply hardwood plywood inserved and stapled into dado in front, back, and sides
12. Drawer Guides: Epoxy coated steel, extreme grade, side mounted guides, self-adjusting in mounting brackets, built in stop, self-closing, and stay closed feature, 100 lb rated load capacity.
13. Hinges: heavy duty, high-quality, concealed 6 way adjustable hinge

14. Scribe trim, fillers, other miscellaneous panels [countertop support brackets]: manufacturer supplied components of same species and finish as cabinets as required by conditions.

2.2 HARDWARE

A. Hinges: Manufacturers standard high quality steel wrap around hinge with self-closing feature.
   1. Slides: 100#, high quality epoxy coated steel, extreme grade, side mounted or equal.
   2. Provide slide out shelves at all pantry and base cabinets at Accessible units

B. Pulls: 4 inch nominal wire pulls, accessible.

2.3 FACTORY FINISHING

A. Exposed To View Surfaces: Stain, seal and varnish.

B. Interior Surfaces: Manufacturers standard.

2.4 PLASTIC LAMINATE COUNTERTOPS

A. Manufacturers:
   1. Formica
   2. Wilsonart
   3. Arborite

B. Plastic Laminate: NEMA LD 3, Grade HGS laminate.
   1. Substrate: ¾" exterior plywood backing with one coat water lox transparent finish.
   2. Countertop Configuration: As follows:
      a. Front Style: Waterfall.
      b. Cove Type: Post formed laminate supported at junction of top and backsplash by wood cove molding.
      c. Backsplash: 4" Curved or waterfall shape
      d. End Splash: 4" Square edge.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify adequacy of backing and location of mechanical and electrical outlets.

3.2 PREPARATION

A. Install supplementary support framing.

3.3 INSTALLATION

A. Set and secure casework in place rigid, plumb, and level.

B. Provide cutouts for plumbing fixtures, appliances, and other fixtures and fittings.

C. Use fixture attachments at concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units and counter tops

E. Carefully scribe casework against other building materials, leaving gaps of 1/32 inch maximum. Use filler strips not additional overlay trim for this purpose.

F. Secure cabinet and counter bases to floor using appropriate anchorage.

G. Adjust moving or operating parts to function smoothly and correctly.

H. Install backsplashes and end splashes.

I. Install door and drawer hardware.

END OF SECTION

SECTION 22 0500 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Summary: General requirements for motors, hangers and supports, vibration isolation, and meters and gages.

B. Submittals: Product Data for materials and equipment specified in this Section.

PART 2 - PRODUCTS

2.1 HANGERS AND SUPPORTS

C. Hanger and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.

D. Building Attachments: Powder-actuated-type, drive-pin attachments with pullout and shear capacities appropriate for supported loads and building materials.

E. Mechanical-Expansion Anchors: Insert wedge-type attachments with pullout and shear capacities appropriate for supported loads and building materials.

2.2 VIBRATION ISOLATION

A. Vibration Supports:

1. Pads: Arranged in single or multiple layers of oil- and water-resistant neoprene, rubber, or hermetically sealed compressed fiberglass of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
2. Mounts: Double-deflection type, with molded, oil-resistant fiberglass, rubber or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and baseplate for bolting to structure. Provide isolator with minimum 0.5-inch static deflection.
3. Spring Isolators: Freestanding, laterally stable, restrained or open-spring isolators. Provide isolator with minimum 1-inch static deflection.

B. Vibration Hangers

1. Elastomeric Hangers: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements bonded to steel housings with threaded connections for hanger rods. Provide isolator with minimum 0.5-inch static deflection.
2. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression. Provide isolator with minimum 1-inch static deflection.

PART 3 - EXECUTION

3.1 GENERAL PIPING INSTALLATIONS

B. Install piping free of sags and bends.

C. Install fittings for changes in direction and branch connections.

D. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, and concrete floor and roof slabs.

E. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast-iron pipes for wall sleeves.

F. Comply with requirements in Division 07 Section "Penetration Firestopping" for sealing pipe penetrations in fire-rated construction.

G. Install unions at final connection to each piece of equipment.

H. Install dielectric unions and flanges to connect piping materials of dissimilar metals in gas piping.

I. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in water piping.

3.2 GENERAL EQUIPMENT INSTALLATIONS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components, unless otherwise indicated.

J. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

K. Install equipment to allow right of way for piping installed at required slope.

3.3 HANGERS AND SUPPORTS

A. Comply with MSS SP-69 and MSS SP-89. Install building attachments within concrete or to structural steel.

B. Install hangers and supports to allow controlled thermal and seismic movement of piping systems.

L. Install powder-actuated drive-pin fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.

M. Install mechanical-expansion anchors in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.

N. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

O. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.

2. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
3. Adjustable Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
4. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
5. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2.

P. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20.
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20, if longer ends are required for riser clamps.

3.4 VIBRATION ISOLATION

A. Adjust vibration isolators to allow free movement of equipment limited by restraints.

B. Install resilient bolt isolation washers and bushings on equipment anchor bolts.

C. Install cables so they do not bend across sharp edges of adjacent equipment or building structure.

END OF SECTION 22 0500

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SECTION 22 0719 - PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 REFERENCES

A. ASTM B209: Aluminum and Aluminum-Alloy Sheet and Plate

B. ASTM C534: Preformed Flexible Elastomeric Cellular Thermal Insulation in Sheet and Tubular Form

C. ASTM C547: Mineral Fiber Preformed Pipe Insulation

D. ASTM C553: Mineral Fiber Blanket and Felt Insulation

E. ASTM C921: Properties of Jacketing Materials for Thermal Insulation

F. ASTM E84: Surface Burning Characteristics of Building Materials

1.2 SUBMITTALS

A. Submit under provisions of Section 15000

B. Product Data: For each product used in this project, provide catalog data for insulation, jackets and accessories, and installation instructions.

C. Samples: Not required

1.3 QUALITY ASSURANCE

A. Materials: Flame spread/smoke developed rating of 25/50 or less in accordance with ASTM E84.

B. Applicator: Company specializing in performing the work of this section with minimum three years experience.

1.4 DELIVERY, STORAGE AND HANDLING

A. Deliver materials to site in original factory packaging, labeled with manufacturer's identification, including product density and thickness.

B. Store insulation in original wrapping, and protect from weather and construction traffic.

C. Protect insulation against dirt, water, chemical and mechanical damage.

PART 2 - PRODUCTS

2.1 RIGID FIBER GLASS INSULATION

A. Provide molded, heavy density, noncombustible; one-piece pipe insulation made from inorganic glass fibers bonded with a thermosetting resin with K-value shall be 0.24 at 75°F per ASTM C547.

B. Provide factory installed, all service jacket of white kraft paper bonded to aluminum foil and reinforced with glass fibers and self-sealing lap for longitudinal seam and butt strips for circumferential joints per ASTM C921.

C. Provide 18-ga, Type 304 stainless steel tie wire with twisted ends on 24" centers but not less than two-tie wires per insulation section.

D. For fittings and valves, provide one-piece, molded, 20-mil thick, PVC covers with fiberglass inserts.

1. Use pressure sensitive, color matching vinyl tape to seal PVC fitting covers to jacket of insulation per ASTM C921

2.2 FLEXIBLE FIBER GLASS INSULATION

A. Provide flexible, noncombustible, blanket insulation made from highly resilient, inorganic glass fibers bonded by a thermosetting resin.

1. Density shall be 1.0 lb/cu ft. K-value shall be 0.28 at 75(F per ASTM C553

B. Provide factory applied, foil-scrim-kraft vapor barrier with 2" wide stapling flange.

1. Secure seams with outward clinching staples on 6" centers.
2. Seal seams with two coats of vapor barrier mastic reinforced with 4" wide, open weave glass fabric per ASTM C921.

2.3 CELLULAR FOAM INSULATION

A. Provide flexible, closed-cell, slit tubing form, elastomeric pipe insulation.

1. For large diameter pipe, provide sheet form.
2. K-value shall be 0.27 at 75(F.
3. Use contact adhesive to seal longitudinal seams and circumferential joints per ASTM C534.

B. For fittings and valves, fabricate insulation from mitered-cut tubular form using contact adhesive to seal joints.

C. If necessary, provide two layers of insulation to obtain specified thickness, staggering the longitudinal and circumferential joints.

2.4 ALUMINUM JACKET

A. For pipes, provide 16 mil thick, stucco embossed pattern finish, Type 1100 aluminum jacket, ASTM B209 and for horizontal pipe, locate longitudinal lap on bottom.

B. For fittings, provide 24-mil thick, die shaped, smooth finish, Type 1100 aluminum jacket, ASTM B209.

C. Provide 0.5" wide, 20-mil thick, Type 3003 aluminum bands on maximum 24" centers but not less than two bands per jacket section.

2.5 SHIELDS AND INSERTS

A. At all pipe hangers or pipe supports, provide 12" long, 180(arc, galvanized sheet metal shields matching the insulation outside dimension.

B. For pipes larger than 2" diameter, provide 12" long, 180(arc, cellular glass insulation inserts.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Before applying insulation, verify the following:

1. The inspection, testing and approval of piping are complete.
2. The surfaces are clean (all foreign material removed) and dry.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. On exposed insulation provide jacket or finish, and locate longitudinal seams in least visible locations.

1. Where insulated piping extends to weather exposed areas, provide specified aluminum sheet metal jacket.

C. Piping insulation or covering shall not penetrate fire-rated assembly unless the specific material has been tested an approved as part of the fire-rated assembly.

D. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe.

E. For above grade applications, maintain 0.5" air space on all sides of the insulation.

F. Finish insulation at supports, protrusions, and interruptions.

G. Storm Water Pipe (Interior and Above Grade Applications)

1. For roof drain bodies, provide 2" thick, flexible fiberglass insulation.
2. For horizontal drains, provide 1" thick, rigid fiberglass insulation.
3. For vertical leaders, insulation is not required.
4. Seal all seams with vapor barrier mastic.
5. Insulate all fittings per Article 2.1.D.

H. Domestic Hot Water Pipe (Interior and Above Grade Applications): For hot water supply and return pipes, provide 1" thick, rigid fiberglass insulation.

I. Domestic Cold Water Pipe (Interior and Above Grade Applications): For hot water supply and return pipes, provide 1" thick, rigid fiberglass insulation.

J. Condensate Pipe (Interior and Above Grade Applications): Provide 3/4" thick, cellular foam insulation.

END OF SECTION 22 0719

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SECTION 22 1113 FACILITY WATER DISTRIBUTION PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section specifies the water distribution piping system, including potable cold, hot and re-circulated hot water piping, fittings, and specialties within the building.

1.2 REFERENCE DOCUMENTS

A. ASTM F 2389-06 - Standard Specification for Pressure-rated Polypropylene (PP) Piping Systems

B. CSA B137.11 - Polypropylene (PP-R) Pipe and Fittings for Pressure Applications

C. NSF/ANSI 14 - Plastic Piping System Components and Related Materials

D. NSF/ANSI 61 - Drinking Water Systems Components - Health Effects

1.3 DEFINITIONS

A. Definitions shall be in accordance with local plumbing codes and ASTM F 2389.

1.4 SUBMITTALS

A. Material list naming each product to be used identified by manufacturer and product number, in accordance with Section 01 30 00.

1.5 QUALITY ASSURANCE

A. Material shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.

B. Material shall comply with manufacturers specifications.

C. Special Engineered products shall be certified by NSF International as complying with NSF 14.

PART 2 - PRODUCTS

2.1 PIPE AND PIPING PRODUCTS

A. Pipe shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The pipe shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All pipe shall comply with the rated pressure requirements of ASTM F 2389. All pipe shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.

B. Pipe shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Piping specifications and ordering information are available at www.gpi-us.com.

2.2 FITTINGS

A. Fittings shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The fittings shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material. All fittings shall be certified by NSF International as complying with NSF 14, NSF 61, and ASTM F 2389 or CSA B137.11.

B. Fittings shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Fittings specifications and ordering information are available at www.gpi-us.com.

2.3 VALVES

A. Valves with PP-R bodies shall be manufactured from a PP-R resin meeting the short-term properties and long-term strength requirements of ASTM F 2389. The valves shall contain no rework or recycled materials except that generated in the manufacturer's own plant from resin of the same specification from the same raw material.

B. Valves with brass bodies shall be manufactured in accordance with the manufacturers specifications and shall by certified by NSF International as complying with NSF 61.

C. Valves shall be aquatherm(r) Fusiotherm(r), Faser(r), or Climatherm(r) available from GreenPipe Industries, LLC. Valve specifications and ordering information are available at www.gpi-us.com.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Install listed pipe materials and joining methods below in the following applications:

1. Underground, Service Entrance Piping: Polypropylene (PP-R) piping in SDR 7.4 or heavier.
2. Aboveground: Polypropylene (PP-R) piping in SDR 6, 7.4 or 11 based on the required minimum pressure rating and use temperature.

3.2 FUSION WELDING OF JOINTS

A. Install fittings and joints using socket-fusion, elecrofusion, or butt-fusion as applicable for the fitting type. All fusion-well joints shall be made in accordance with the pipe and fitting manufacturer's specifications and product standards.

B. Fusion-weld tooling, welding machines, and electrofusion devices shall be as specified by the pipe and fittings manufacturer.

C. Prior to joining, the pipe and fittings shall be prepared in accordance with F 2389 and the manufacturer's specifications.

D. Joint preparation, setting and alignment, fusion process, cooling times and working pressure shall be in accordance with the pipe and fitting manufacturer's specifications.

3.3 VALVE APPLICATIONS

A. Install gate valves close to main on each branch and riser serving 2 or more plumbing fixtures or equipment connections and where indicated.

B. Install gate or ball valves on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.

C. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.

D. Install swing check valve on discharge side of each pump and elsewhere as indicated.

E. Install ball valves in each hot-water circulating loop and discharge side of each pump.

3.4 PIPING INSTALLATIONS

A. Install hangers and supports at intervals specified in the applicable Plumbing Code and as recommended by pipe manufacturer.

B. Support vertical piping at each floor and as specified in the applicable Plumbing Code.

3.5 INSPECTING AND CLEANING

A. Inspect and test piping systems following procedures of authorities having jurisdiction and as specified by the piping system manufacturer.

B. Clean and disinfect water distribution piping following procedures of the authority having jurisdiction.

END OF SECTION 22 1113

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SECTION 22 1116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes water distribution piping from locations indicated to fixtures and equipment inside building.

B. Related Sections include the following:

1. Division 2 Section "Water Systems" for exterior water service piping.
2. Division 2 Section "Water Systems" for exterior water service piping and water meters.
3. Division 22 for water meters, thermometers, pressure gages, fittings, thermometers, pressure gages, and fittings, and water distribution piping specialties.

1.3 DEFINITIONS

A. Water Service Piping: Water piping outside building that conveys water to building.

B. Service Entrance Piping: Water piping at entry into building between water service piping and water distribution piping.

C. Water Distribution Piping: Water piping inside building that conveys water to fixtures and equipment throughout the building.

D. The following are industry abbreviations for plastic piping materials:

1. CPVC: Chlorinated polyvinyl chloride.
2. PVC: Polyvinyl chloride.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:

1. Combined Fire-Protection and Domestic, Service Entrance Piping: 250 psig (1725 kPa).
2. Service Entrance Piping: 160 psig (1100 kPa).
3. Water Distribution Piping: 125 psig (860 kPa).

1.5 SUBMITTALS

A. Water Samples, Test Results, and Reports: Specified in "Field Quality Control" and "Cleaning" articles.

1.6 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic potable-water piping components. Include marking "NSF-pw" on plastic potable-water piping.

D. Comply with NSF 61, "Drinking Water System Components--Health Effects," Sections 1 through 9 for potable-water piping and components.

PART 2 - PRODUCTS

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Hard Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper.

C. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.

D. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends. Include threads conforming to ASME B1.20.1 on threaded ends.

2.3 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Refer to Division 22 Section "Common Results for Plumbing" for commonly used joining materials.

C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.

D. Copper, Keyed Couplings: Copper-tube dimensions and design similar to AWWA C606. Include ferrous housing sections, gasket suitable for hot water, and bolts and nuts.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Fitting Option: Mechanically formed tee-branch outlets and brazed joints may be used on aboveground copper tubing.

D. Underground, Service Entrance Piping: Do not use flanges or valves underground. Use the following:

1. 2-Inch and Smaller: ASTMB 88, Soft copper tube, Type K soft drawn copper, solder-joint pressure fittings; and soldered joints.

2. 2-1/2 and 3": ASTM B 88, Type K hard drawn copper, solder-joint pressure fittings; and soldered joints.

3. 4" and Larger: AWWA C900, PVC pipe, ASTM F477 gaskets, ASTM D3139 joints, Pressure Class 165 psi (DR 25)

E. Aboveground, Water Distribution Piping: Use the following:

1. 2" and Smaller: ASTM B 88, Type L, water tube, drawn copper, solder-joint pressure fittings; and soldered joints.

2. 2-1/2- and Larger: ASTM B 88, Type L, water tube, drawn copper, solder-joint pressure fittings; and soldered joints.

F. Underground, Water Distribution Piping: Do not use flanges or valves underground. Use the following:

1. 2-Inch and Smaller: ASTM B 88, Soft copper tube, Type K soft drawn copper tubing with 125 psi wrought copper sweat fittings soldered with silver solder.

2. Water piping below grade (trap primer supply) - Shall be type 'K' soft drawn copper continuous tubing.

3. 2-1/2- and larger: ASTM B 88, Type K hard drawn copper, solder-joint pressure fittings; and soldered joints.

3.4 PIPE TRENCHES

A. Top of largest pipe shall be a minimum of 16" below finished floor. Provide a 4" clean sand bed, tamped in place, for piping to lay on. Provide a minimum of 2" spacing between adjacent pipes and 4" to the sides of trench. Backfill over all piping in trench with clean sand providing 4-6" of compacted sand above top of largest pipe. Backfill remaining trench, evenly and continuously, with uniformed layers of suitable gravel aggregate.

3.4 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball valves.
2. Throttling Duty: Use ball valves.

3.5 PIPING INSTALLATION, GENERAL

A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping installation.

3.6 SERVICE ENTRANCE PIPING INSTALLATION

A. Extend service entrance piping to exterior water service piping in sizes and locations indicated for service entrances into building.

B. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside building at each service entrance pipe.

C. Install water-pressure regulators downstream from shutoff valves.

D. Ductile-Iron, Service Entrance Piping: Comply with AWWA C600. Install buried piping between shutoff valve and connection to water service piping with restrained joints. Anchor pipe to wall or floor at entrance. Include thrust-block supports at vertical and horizontal offsets.

1. Encase piping with polyethylene film according to ASTM A 674 or AWWA C105.

E. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for sleeves and mechanical sleeve seals.

3.7 WATER DISTRIBUTION PIPING INSTALLATION

A. Install piping level without pitch.

B. Fitting Option for Hard Copper Tube: Mechanically formed tee-branch outlets may be used instead of tee fittings.

3.8 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping joint construction.

B. Mechanically Formed Outlets: Form tee in copper tube according to equipment manufacturer's written instructions. Use tool designed for copper tube, drill pilot hole, form collar for outlet, dimple tube forming seating stop, and braze branch tube into collar.

C. Grooved Joints: Assemble joints with coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

D. Solvent-Cemented, Thermoplastic Pipe and Fitting Joints: Handle cleaners, primers, and solvent cements according to ASTM F 402.

3.9 VALVE INSTALLATION

A. Sectional Valves: Install sectional valves close to main on each branch and riser serving plumbing fixtures or equipment, and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.

B. Shutoff Valves: Install shutoff valve on each water supply to equipment, on each supply to plumbing fixtures without supply stops, and where indicated. Use ball valves for piping 2-inch NPS (DN50) and smaller.

C. Drain Valves: Install drain valves for equipment, at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

1. Install hose-end drain valves at low points in water mains, risers, and branches.
2. Install stop-and-waste drain valves where indicated.

D. Balancing Valves: Install in each hot-water circulation return branch, discharge side of each pump and circulator, and where indicated. Use ball valve for piping 2-inch NPS (DN50) and smaller.

E. Calibrated Balancing Valves: Install in each hot-water circulation return branch, discharge side of each pump and circulator, and where indicated.

3.10 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices. Install the following:

1. Riser clamps, MSS Type 8 or Type 42, for vertical runs.
2. Adjustable steel clevis hangers, MSS Type 1, for individual, straight, horizontal runs 100 feet (30 m) and less.
3. Adjustable roller hangers, MSS Type 43, for individual, straight, horizontal runs longer than 100 feet (30 m).
4. Spring cushion rolls, MSS Type 49, if indicated, for individual, straight, horizontal runs longer than 100 feet (30 m).
5. Pipe rolls, MSS Type 44, for multiple, straight, horizontal runs 100 feet (30 m) or longer. Support pipe rolls on trapeze.
6. Spring hangers, MSS Type 52, for supporting base of vertical runs.

B. Install supports according to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment."

C. Support vertical piping and tubing at base and at each floor.

D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.

E. Install hangers for copper tubing with the following maximum spacing and minimum rod diameters:

1. 3/4-Inch NPS (DN20) and Smaller: Maximum horizontal spacing, 60 inches (1500 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
2. 1-Inch NPS (DN25): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
3. 1-1/4-Inch NPS (DN32): Maximum horizontal spacing, 72 inches (1800 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).
4. 1-1/2 and 2-Inch NPS (DN40 and DN50): Maximum horizontal spacing, 96 inches (2400 mm) with 3/8-inch (10-mm) minimum rod diameter; maximum vertical spacing, 10 feet (3 m).

3.11 CONNECTIONS

A. Connect service entrance piping to exterior water service piping. Use transition fitting to join dissimilar piping materials.

B. Connect water distribution piping to service entrance piping at shutoff valve, and extend to and connect to the following:

1. Booster Systems: Connect cold-water suction and discharge piping.
2. Water Heaters: Connect cold-water supply and hot-water outlet piping in sizes indicated, but not smaller than sizes of water heater connections.
3. Plumbing Fixtures: Connect hot- and cold-water supply piping in sizes indicated, but not smaller than required by plumbing code. Refer to Division 22 Section "Plumbing Fixtures."
4. Equipment: Connect hot- and cold-water supply piping as indicated. Provide shutoff valve and union for each connection.

3.12 FIELD QUALITY CONTROL

A. Inspect service entrance piping and water distribution piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

    a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test service entrance piping and water distribution piping as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced water piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
3. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
4. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
5. Prepare reports for tests and required corrective action.

3.13 CLEANING

A. Clean and disinfect service entrance piping and water distribution piping as follows:

1. Purge new piping and parts of existing water piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedure prescribed by authorities having jurisdiction or, if method is not prescribed, procedure described in either AWWA C651 or AWWA C652 or as described below:

    a. Flush piping system with clean, potable water until dirty water does not appear at outlets.
    b. Fill and isolate system according to either of the following:

        1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.

    c. Flush system with clean, potable water until chlorine is no longer in water coming from system after the standing time.
    d. Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedure if biological examination shows contamination.

D. Prepare and submit reports for purging and disinfecting activities.

E. Clean interior of piping system. Remove dirt and debris as work progresses.

3.14 COMMISSIONING

A. Fill water piping. Check components to determine that they are not air bound and that piping is full of water.

B. Perform the following steps before putting into operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and that cartridges are clean and ready for use.

C. Check plumbing equipment and verify proper settings, adjustments, and operation. Do not operate water heaters before filling with water.

D. Check plumbing specialties and verify proper settings, adjustments, and operation.

1. Water-Pressure Regulators: Set outlet pressure at 80 psig (550 kPa) maximum, unless otherwise indicated.

E. Energize pumps and verify proper operation.

END OF SECTION 22 1116

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SECTION 22 13 13 - FACILITY SANITARY SEWERS

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes gravity-flow, nonpressure sanitary sewerage outside the building, with the following components:

1. Cleanouts.
2. Precast Concrete Manholes

1.02 PERFORMANCE REQUIREMENTS

A. Gravity-Flow, Nonpressure, Drainage-Piping Pressure Rating: 10-foot head of water.

B. Force-Main, Pressure-Piping Pressure Rating: At least equal to system operating pressure but not less than 200 psig.

1.03 SUBMITTALS

A. Coordination Drawings: Show pipe sizes, locations, and elevations.

B. Shop Drawings: For manholes and vaults. Include plans, elevations, sections, details and frames and covers.

C. Field quality-control test reports.

D. Product Data: For the following:

1. Cleanouts.
2. Pipe material.

1.04 PROJECT CONDITIONS

A. Site Information: Research public utility records and verify existing utility locations prior to ordering any materials. Notify the Designer immediately if any discrepancies are found in the project survey.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.02 PIPING MATERIALS

A. Refer to Part 3 "Piping Applications" Article for applications of pipe, fitting, and joining materials.

2.03 PVC, PRESSURE SEWER PIPE AND FITTINGS

A. PVC Pipe and Fittings: According to one of the following:

1. Class 200 rigid PVC Class 12454-B, conforming to ASTM D-1784 and ASTM D-2241 or ASTM D-1785 and ASTM D-2241

2. C900 with a minimum DR 18

B. Class 200 PVC shall be wrapped four times per 20-foot section with detection tape.

C. Joints:
1. Rubber gasketed joints shall conform to ASTM F-477

2. Solvent welded joints shall conform to ASTM D-2466 and ASTM D-2467

2.04 PVC, GRAVITY SEWER PIPE AND FITTINGS

A. PVC Sewer Pipe and Fittings: According to the following:

1. PVC Sewer Pipe and Fittings, NPS 4 to NPS 15: ASTM D 3034, SDR 35, gasketed joints.

a. Gaskets: ASTM F 477, elastomeric seals.

2.05 NONPRESSURE-TYPE PIPE COUPLINGS

A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground nonpressure piping. Include ends of same sizes as piping to be joined and corrosion-resistant-metal tension band and tightening mechanism on each end.

B. Sleeve Materials:

1. For Plastic Pipes: ASTM F 477, elastomeric seal or ASTM D 5926, PVC.
2. For Dissimilar Pipes: ASTM D 5926, PVC, or other material compatible with pipe materials being joined.

2.06 CLEANOUTS

A. PVC Cleanouts: PVC body with PVC threaded plug. Include PVC sewer pipe fitting and riser to cleanout of same material as sewer piping.

2.07 GRINDER

A. Not Used.

2.08 MANHOLES

A. Standard Precast Concrete Manholes: ASTM C 478 precast, reinforced concrete, of depth indicated, with provision for rubber gasketed joints.

1. Diameter: 48 inches minimum, unless otherwise indicated.
2. Ballast: Increase thickness of precast concrete sections or add concrete to base section, as required to prevent flotation if site conditions warrant and/or as shown in the plans.
3. Base Section: 6-inch minimum thickness for floor slab and 5-inch (125-mm) minimum thickness for walls and base riser section, and having separate base slab or base section with integral floor.
4. Riser Sections: 5-inch minimum thickness, and of length to provide depth indicated.
5. Top Section: Eccentric-cone type, unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
6. Gaskets: ASTM C 443, rubber.
7. Resilient Pipe Connectors: ASTM C 923, cast or fitted into manhole walls, for each pipe connection.
8. Steps: Individual FRP steps wide enough to allow worker to place both feet on 1 step and designed to prevent lateral slippage off of step. Cast or anchor steps into sidewalls at 12-inch intervals.
9. Adjusting Rings: Interlocking rings with level or sloped edge in thickness and diameter matching manhole frame and cover. Include sealant recommended by ring manufacturer.
10. Grade Rings: Reinforced-concrete rings, 6- to 9-inch total thickness, to match diameter of manhole frame and cover.
11. Manhole Frames and Covers: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch-minimum width flange and 26-inch (660-mm) diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "SANITARY SEWER."

    a. Material: ASTM A 536, Grade 60-40-18 ductile iron, designed for heavy duty service, unless otherwise indicated.

2.09 CONCRETE

A. General: Cast-in-place concrete according to ACI 318/318R, ACI 350R, and the following:

1. Cement: ASTM C 150, Type II.
2. Fine Aggregate: ASTM C 33, sand.
3. Coarse Aggregate: ASTM C 33, crushed gravel.
4. Water: Potable.

B. Portland Cement Design Mix: 4000 psi minimum, with 0.45 maximum water/ cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

C. Manhole Channels and Benches: Factory or field formed from concrete. Portland cement design mix, 4000 psi minimum, with 0.45 maximum water/cementitious materials ratio. Include channels and benches in manholes.

1. Channels: Concrete invert, formed to same width as connected piping, with height of vertical sides to three-fourths of pipe diameter. Form curved channels with smooth, uniform radius and slope.

a. Invert Slope: 5 percent through manhole.

2. Benches: Concrete, sloped to drain into channel.

a. Slope: 8 percent.

D. Ballast and Pipe Supports: Portland cement design mix, 3000 psi minimum, with 0.58 maximum water/cementitious materials ratio.

1. Reinforcement Fabric: ASTM A 185, steel, welded wire fabric, plain.
2. Reinforcement Bars: ASTM A 615/A 615M, Grade 60, deformed steel.

PART 3 - EXECUTION

3.01 PIPING INSTALLATION

A. Excavating, trenching, and backfilling are specified in Section 312000.

B. Identification: Materials and their installation are specified in Section 312000. Arrange for installing green warning tapes directly over piping and at outside edges of underground structures.

1. Use detectable warning tape over all piping and over edges of underground structures.
2. Locate the ends of all side sewers with a 2 by 4 wooden stake four (4) feet long buried in the ground a depth of three (3) feet. The lower end shall have a 2 by 4 cleat nailed to it to prevent withdrawal of the stake. The exposed one (1) foot shall be painted traffic white and the depth to the side sewer or tee shall be indicated in black paint on the 2 by 4. In addition, a length of 12 gauge galvanized wire shall be provided to extend from the plugged end of the side sewer or tee. The upper end shall emerge at the four (4) foot stake, but shall not be fastened to it.

C. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground sanitary sewerage piping. Location and arrangement of piping layout take design considerations into account. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.

D. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for using lubricants, cements, and other installation requirements.

E. Install manholes for changes in direction, unless fittings are indicated. Use fittings for branch connections, unless direct tap into existing sewer is indicated.

F. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.

G. Install gravity-flow, nonpressure, drainage piping according to the following:

1. Install piping pitched down in direction of flow, at minimum slope of 2 percent, unless otherwise indicated.
2. Install piping with 36-inch minimum cover.

3. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.

H. Install force-main piping as shown on the plans
1. Install piping with restrained joints at horizontal and vertical changes in direction. Use cast in place concrete supports and anchors or corrosion resistant rods and clamps.
2. Install piping with 36-inch minimum cover unless otherwise indicated on plans.

I. Clear interior of piping and manholes of dirt and superfluous material as work progresses. Maintain swab or drag in piping, and pull past each joint as it is completed. Place plug in end of incomplete piping at end of day and when work stops.

J. Protect existing piping and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

3.02 PIPE JOINT CONSTRUCTION

A. Where specific joint construction is not indicated, follow piping manufacturer's written instructions.

B. Install pressure pipe according to ASTM F645

C. Join gravity-flow, nonpressure, drainage piping according to the following:

1. Join hub-and-spigot, cast-iron soil piping with gasket joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
2. Join hub-and-spigot, cast-iron soil piping with calked joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for lead and oakum calked joints.
3. Join ductile-iron, gravity sewer piping according to AWWA C600 for push-on joints.
4. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-gasket joints.
5. Join dissimilar pipe materials with nonpressure-type, flexible couplings.

3.03 MANHOLE INSTALLATION

A. General: Install manholes complete with appurtenances and accessories indicated.

B. Install precast concrete manhole sections with gaskets according to ASTM C 443.

C. Form continuous concrete channels and benches between inlets and outlet.

D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere, unless otherwise indicated.

3.04 CLEANOUT INSTALLATION

A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron soil pipe for

riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.

1. Use light-duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
2. Use medium-duty, top-loading classification cleanouts in paved foot-traffic areas.
3. Use heavy-duty, top-loading classification cleanouts in vehicle-traffic service areas.
4. Use extra-heavy-duty, top-loading classification cleanouts in roads.

B. Set cleanout frames and covers in earth in cast-in-place-concrete block, per plans. Set with tops 1-inch above surrounding grade.

C. Set cleanout frames and covers in concrete pavement with tops flush with pavement surface.

3.05 CONNECTIONS

A. Connect nonpressure, gravity-flow drainage piping to building's sanitary building drains.

B. Make connections to existing piping and underground structures so finished Work complies with requirements specified for new Work.

3.06 FIELD QUALITY CONTROL

A. Inspect interior of piping to determine whether line displacement or other damage has occurred. Inspect after approximately 24 inches of backfill is in place, and again at completion of Project.

1. Defects requiring correction include the following:

   a. Alignment: Less than full diameter of inside of pipe is visible between structures.
   b. Deflection: Flexible piping with deflection that prevents passage of ball or cylinder of size not less than 92.5 percent of piping diameter.
   c. Crushed, broken, cracked, or otherwise damaged piping.
   d. Infiltration: Water leakage into piping.
   e. Exfiltration: Water leakage from or around piping.

2. Replace defective piping using new materials, and repeat inspections until defects are within allowances specified.
3. Reinspect and repeat procedure until results are satisfactory.

B. Test new piping systems, and parts of existing systems that have been altered, extended, or repaired, for leaks and defects.

1. Do not enclose, cover, or put into service before inspection and approval.
2. Test completed piping systems according to requirements of authorities having jurisdiction.
3. Schedule tests and inspections by authorities having jurisdiction with at least 24 hours' advance notice.
4. Submit separate report for each test.

5. Air Tests: Test sanitary sewerage according to requirements of authorities having jurisdiction, UNI-B-6, and the following:

a. Option: Test plastic gravity sewer piping according to ASTM F 1417.
b. Option: Test concrete gravity sewer piping according to ASTM C 924.

C. Manholes: Perform hydrostatic test according to ASTM C497.

D. Leaks and loss in test pressure constitute defects that must be repaired.

E. Replace leaking piping using new materials, and repeat testing until leakage is within allowances specified.

END OF SECTION

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SECTION 22 1316 - SANITARY WASTE AND VENT PIPING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes sanitary drainage and vent piping, and storm drainage piping inside building and to locations indicated.

B. Related Sections include the following:

1. Division 2 Section "Sewerage and Drainage" for sanitary sewerage and storm drainage.
2. Division 2 Section "Foundation Drainage Systems" for foundation drains.
3. Division 2 Section "Interceptors" for sewerage and drainage system interceptors.

1.3 DEFINITIONS

A. Sewerage Piping: Building sewer piping outside building that conveys sanitary sewage from building.

B. Drainage Piping: Building sewer piping outside building that conveys storm drainage from building.

C. Service Entrance Piping: Drainage piping at entry into building between outside building sewer piping and inside drainage piping.

D. Drainage and Vent Piping: Piping inside building that conveys waste water and vapors from fixtures and equipment throughout the building.

E. Force-Main Piping: Drainage piping, under pressure.

F. The following are industry abbreviations for plastic and other piping materials:

1. ABS: Acrylonitrile-butadiene-styrene.
2. EPDM: Ethylene-propylene-diene polymer, rubber.
3. NBR: Acrylonitrile-butadiene rubber.
4. PVC: Polyvinyl chloride.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. Provide components and installation capable of producing piping systems with the following minimum working-pressure ratings, unless otherwise indicated:

1. Soil, Waste, and Vent Systems: 10-foot head of water (30 kPa).
2. Storm Drainage Systems: 10-foot head of water (30 kPa).
3. Sewage, Force-Main Piping Systems: 100 psig (690 kPa).

1.5 SUBMITTALS

A. Test Results and Reports: Specified in "Field Quality Control" Article.

1.6 QUALITY ASSURANCE

A. Provide listing/approval stamp, label, or other marking on piping made to specified standards.

B. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.

C. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; "NSF-drain" for plastic drain piping; "NSF-tubular" for plastic continuous waste piping; and "NSF-sewer" for plastic sewer piping.

PART 2 - PRODUCTS

2.1 PIPES AND TUBES

A. General: Applications of the following pipe and tube materials are indicated in Part 3 "Piping Applications" Article.

B. Hub-and-Spigot, Cast-Iron Soil Pipe: ASTM A 74, Service and Extra Heavy classes. Include ASTM C 564 rubber gasket, with dimensions required for pipe class, for each hub.

C. Hubless, Cast-Iron Soil Pipe: ASTM A 888 or CISPI 301.

D. Hard Copper Tube: ASTM B 88, Types L and M (ASTM B 88M, Types B and C), water tube, drawn temper.

E. Hard Copper Tube: ASTM B 306, drainage tube, drawn temper.

F. PVC Plastic Pipe: ASTM D 2665, Schedule 40.

2.2 PIPE AND TUBE FITTINGS

A. General: Applications of the following pipe and tube fitting materials are indicated in Part 3 "Piping Applications" Article.

B. Threaded-Fitting, End Connections: ASME B1.20.1.

C. Hubless, Cast-Iron, Soil-Pipe Fittings: CISPI 301.

D. Cast-Iron Sovent Fittings: ASME B16.45 drainage-pattern aerator and deaerator.

E. Copper, Solder-Joint Drainage Fittings: ASME B16.23 cast copper or ASME B16.29 wrought copper.

F. Copper Sovent Fittings: ASME B16.32 cast copper, drainage-pattern aerator and deaerator.

G. Copper, Solder-Joint Pressure Fittings: ASME B16.18 cast-copper alloy or ASME B16.22 wrought copper. Furnish wrought-copper fittings if indicated.

H. Copper, Grooved-End Fittings: ASTM B 75 (ASTM B 75M) copper tube or ASTM B 584 bronze castings.

I. Bronze Flanges: ASME B16.24, Class 150, bronze, with solder-joint end.

J. Copper Unions: ASME B16.18, cast-copper-alloy, hexagonal-stock body with ball-and-socket joint, metal-to-metal seating surfaces, and solder-joint, threaded, or solder-joint and threaded ends.

K. Malleable-Iron Unions: ASME B16.39, Class 150, hexagonal-stock body with ball-and-socket joint, metal-to-metal bronze seating surfaces, and female threaded ends with threads according to ASME B1.20.1.

L. Cast-Iron, Threaded Fittings: ASME B16.4, Class 125, galvanized, standard pattern.

M. Cast-Iron, Threaded Drainage Fittings: ASME B16.12, galvanized, recessed, drainage pattern.

N. Cast-Iron, Threaded Flanges: ASME B16.1, Class 125.

O. Steel, Grooved-End Fittings: ASTM A 47 (ASTM A 47M) malleable-iron casting, ASTM A 106 steel pipe, or ASTM A 536 ductile-iron casting with dimensions matching steel pipe.

P. Ferrous Expansion Joints: Compound, galvanized steel fitting with telescoping body and slip-pipe section. Include packing rings, packing, limit rods, chrome-plated finish on slip-pipe section, and flanged ends.

Q. Ferrous, Double Expansion Joints: Compound, galvanized steel fitting with telescoping body and 2 slip-pipe sections. Include packing rings, packing, limit rods, chrome-plated finish on slip-pipe sections, and flanged ends.

R. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311 drain, waste, and vent pipe patterns.

S. PVC Plastic, Tubular Fittings: ASTM F 409 drainage pattern, with ends as required for application.

2.3 JOINING MATERIALS

A. General: Applications of the following piping joining materials are indicated in Part 3 "Piping Applications" Article.

B. Refer to Division 22 Section "Common Results for Plumbing" for commonly used joining materials.

C. Solder: ASTM B 32, Alloy Sn95, Sn94, or E; lead free.

D. Hubless, Cast-Iron, Soil-Piping Couplings: ASTM C 1277 assembly of metal housing, corrosion-resistant fasteners, and ASTM C 564 rubber sleeve or gasket with integral, center pipe stop. Include the following:

1. Heavy-Duty, Stainless-Steel Couplings: ASTM A 666, Type 304, stainless-steel housing or shield; and stainless-steel clamps. Include gasket.

    a. Clamp Width: 3 inches (75 mm) wide with 4 clamps, for piping 1-1/2- to 4-inch NPS (DN40 to DN100).
    b. Clamp Width: 4 inches (100 mm) wide with 6 clamps, for piping 5- to 10-inch NPS (DN125 to DN250).

E. Transition Couplings: Coupling or other manufactured fitting same size as, with pressure rating at least equal to, and with ends compatible with piping to be joined.

F. Flexible, Transition Couplings for Underground, Nonpressure Piping: ASTM C 1173 with elastomeric sleeve. Include ends same sizes as piping to be joined and include corrosion-resistant metal band on each end.

1. Sleeve Type for Plain-End Piping: Rubber or elastomeric sleeve and stainless-steel band assembly, fabricated to match outside diameters of piping to be joined. Include the following:

a. Sleeves for Cast-Iron Soil Piping: ASTM C 564 rubber.
b. Sleeves for Plastic Piping: ASTM F 477 elastomeric seal.
c. Sleeves for Dissimilar Piping: Compatible with piping materials to be joined.
d. Bands: Stainless steel, one at each pipe insert.

2. Gasket Type for Dissimilar-End Piping: Rubber or elastomeric compression gasket, made to match inside diameter of pipe or hub, and outside diameter of adjoining pipe. Include the following:

a. Gaskets for Cast-Iron Soil Piping: ASTM C 564 rubber.
b. Gaskets for Plastic Piping: ASTM F 477 elastomeric seal.
c. Gaskets for Dissimilar Piping: Compatible with piping materials to be joined.

2.4 VALVES

A. Refer to Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves. Use valves specified for "Domestic Water Systems" applications.

PART 3 - EXECUTION

3.1 EXCAVATION

A. Refer to Division 2 Section "Earthwork" for excavating, trenching, and backfilling.

3.2 PIPING APPLICATIONS

A. Transition and special fittings with pressure ratings at least equal to piping pressure rating may be used in applications below, unless otherwise indicated.

B. Flanges may be used on aboveground piping, unless otherwise indicated.

C. Above ground, Sanitary Waste and Vent Piping: Use either of the following materials:

1. Hubless, cast-iron soil piping:

a. Couplings: Compact, stainless steel.

2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

D. Underground, Sanitary Waste and Vent Piping: Use the either of the following materials:

1. Hub-and-Spigot pipe and fittings.
2. Solid-wall PVC pipe, PVC socket fittings, and solvent-cemented joints.

3.3 VALVE APPLICATIONS

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use ball valves.
2. Throttling Duty: Use ball valves.

B. Grooved-end butterfly valves may be used with grooved-end piping.

3.4 PIPING INSTALLATION, GENERAL

A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping installation.

3.5 SERVICE ENTRANCE PIPING INSTALLATION

A. Refer to Division 2 Section "Sewerage and Drainage" for sanitary and storm sewer piping.

B. Extend building sanitary drain piping and connect to sanitary sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building sanitary drains with building sanitary sewers.

C. Extend building storm drain piping and connect to storm sewer piping in sizes and locations indicated for service entrances into building. Install cleanout and extension to grade at connections of building storm drains and building storm sewers.

D. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service entrance pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for sleeves and mechanical sleeve seals.

E. Install wall penetration system at each service entrance pipe penetration through foundation wall. Make installation watertight. Refer to Division 22 Section "Common Results for Plumbing" for wall penetration systems.

3.6 DRAINAGE AND VENT PIPING INSTALLATION

A. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

B. Make changes in direction for drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not make change in direction of flow greater than 90 degrees. Use proper size of standard increasers and reducers if different sizes of piping are connected. Reducing size of drainage piping in direction of flow is prohibited.

C. Lay buried building drain piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

D. Install drainage and vent piping at the following minimum slopes, unless otherwise indicated:

1. Sanitary Building Drain: 2 percent downward in direction of flow for piping 3-inch NPS (DN80) and smaller; 1 percent downward in direction of flow for piping 4-inch NPS (DN100) and larger.
2. Horizontal, Sanitary Drainage Piping: 2 percent downward in direction of flow.
3. Storm Building Drain: 1 percent downward in direction of flow.
4. Horizontal, Storm Drainage Piping: 2 percent downward in direction of flow.
5. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

E. Install engineered, sanitary drainage and vent systems in locations indicated and as follows:

1. Combination Waste and Vent: Comply with standards of authorities having jurisdiction.

2. Copper, Sovent, Single Stack: Comply with CDA 402/0, "Brass and Bronze Design Handbook, Single-Stack Plumbing System."
3. Cast-Iron, Sovent, Single Stack: Comply with ASSE 1043 and sovent fitting manufacturer's written installation instructions.
4. Reduced-Size Venting: Comply with standards of authorities having jurisdiction.

F. Install engineered, controlled-flow, storm drainage systems in locations indicated. Comply with standards of authorities having jurisdiction.

G. Sleeves are not required for cast-iron soil piping passing through concrete slab on grade if slab is without membrane waterproofing.

H. Install PVC plastic drainage piping according to ASTM D 2665.

I. Install underground, PVC plastic drainage piping according to ASTM D 2321.

3.7 JOINT CONSTRUCTION

A. Refer to Division 22 Section "Common Results for Plumbing" for basic piping joint construction.

B. Cast-Iron, Soil-Piping Joints: Make joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

1. Compression Joints: Make with rubber gasket matching class of pipe and fittings.
2. Hubless Joints: Make with rubber gasket and sleeve or clamp.

C. Grooved Joints: Assemble joints with coupling, gasket, lubricant, and bolts according to coupling and fitting manufacturer's written instructions.

D. PVC Piping Joints: Join drainage piping according to ASTM D 2665.

E. Handling of Solvent Cements, Primers, and Cleaners: Comply with procedures in ASTM F 402 for safe handling during joining of plastic pipe and fittings.

3.8 VALVE INSTALLATION

A. Shutoff Valves: Install shutoff valve on each pump discharge and where indicated. Use gate or ball valves for piping 2-inch NPS (DN50) and smaller.

B. Check Valves: Install swing check valve on each pump discharge, downstream from shutoff valve.

3.9 HANGER AND SUPPORT INSTALLATION

A. Refer to Division 22 Section "Hangers and Supports for Plumbing Piping and Equipment" for pipe hanger and support devices. Install the following:

3.10 CONNECTIONS

A. Connect service entrance piping to exterior sewerage and drainage piping. Use transition fitting to join dissimilar piping materials.

B. Connect drainage piping to service entrance piping, and extend to and connect to the following:

1. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
2. Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection.

C. Connect force-main piping to service entrance piping, and extend to and connect to the following:

1. Sump Pumps: Connect force-main piping to sump-pump discharge.
2. Sewage Pumps: Connect force-main piping to sewage-pump discharge.

3.11 FIELD QUALITY CONTROL

A. Inspect drainage and vent piping as follows:

1. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.

    a. Roughing-In Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
    b. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test drainage and vent piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:

1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
2. Leave uncovered and unconcealed new, altered, extended, or replaced drainage and vent piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
3. Roughing-In Plumbing Test Procedure: Test drainage and vent piping, except outside leaders, on completion of roughing-in. Close openings in piping system and fill with

water to point of overflow, but not less than 10 feet of head (30 kPa). Water level must not drop from 15 minutes before inspection starts through completion of inspection. Inspect joints for leaks.

4. Finished Plumbing Test Procedure: After plumbing fixtures have been set and traps filled with water, test connections and prove they are gastight and watertight. Plug vent-stack openings on roof and building drains where they leave building. Introduce air into piping system equal to pressure of 1-inch wg (250 Pa). Use U-tube or manometer inserted in trap of water closet to measure this pressure. Air pressure must remain constant without introducing additional air throughout period of inspection. Inspect plumbing fixture connections for gas and water leaks.
5. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

C. Test force-main piping according to procedures of authorities having jurisdiction or, in absence of published procedure, as follows:

1. Leave uncovered and unconcealed new, altered, extended, or replaced force-main piping until it has been tested and approved. Expose work that has been covered or concealed before it has been tested and approved.
2. Cap and subject piping to static-water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for 4 hours. Leaks and loss in test pressure constitute defects that must be repaired.
3. Repair leaks and defects using new materials and retest piping or portion thereof until satisfactory results are obtained.
4. Prepare reports for tests and required corrective action.

3.12 CLEANING AND PROTECTING

A. Clean interior of piping system. Remove dirt and debris as work progresses.

B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.

C. Place plugs in ends of uncompleted piping at end of day and when work stops.

D. Exposed PVC Piping: Protect plumbing vents exposed to sunlight with 2 coats of water-based latex paint.

END OF SECTION 22 1316

SECTION 22 34 13

INSTANTANEOUS, TANKLESS, GAS DOMESTIC WATER HEATERS

1.1 SUMMARY

A. Section Includes:
   1. Indoor Tankless Gas Water Heaters.

1.2 DEFINITIONS

A. Tankless Gas Domestic Water Heater: Internally or externally mounted, or freestanding, commercial condensing, multiple point-of-use, gas fired water heater.

1.3 SUBMITTALS

A. Submit in accordance with requirements of Section 01 30 00 - Administrative Requirements.

B. Product Data: Manufacturer's technical data sheets, specifications, performance data and installation instructions for all products referenced in the scope of work defined in this section.

C. Shop Drawings: Submit shop drawings required to depict the requirements for fabrication and installation. Include the following drawings as applicable:
   1. Include dimension drawings of water heaters indicating components and connections to other equipment and piping.
   2. Include heat-exchanger dimensions, size of tappings, and performance data.

1.4 CLOSEOUT SUBMITTALS

A. Provide original manufacturer’s installation and operation manuals.

B. Provide written manufacturer’s warranty.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Primary products in this section to be provided by a manufacturer with no less than five years of experience producing the products specified in this section at a facility in the United States.

B. Installer's Qualifications: All work specified in this section is to be completed by a firm with demonstrated experience installing systems similar in scope and complexity to those specified.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store and handle materials and products in accordance with the manufacturer's instructions and recommendations and industry standards.

B. Store all materials in the manufacturer’s original packaging until ready for installation. Protect all products from damage or exposure to adverse environmental conditions, including weather, humidity, and dust.

C. Provide temporary inlet and outlet caps, maintain caps in place until installation.

1.7 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's recommended limits.

1.8 WARRANTY

A. Manufacturer’s Warranty: Manufacturer agrees to replace products that fail within the specified warranty period.
   1. Failure Methods: Condensate corrosion, thermal stress, mechanical defects, or workmanship.
   2. Heat Exchanger: 15 years from date of Substantial Completion under standard or controlled regulation.
   3. All Other Parts and Components: 5 years from date of Substantial completion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Manufacturer: Navien Inc.
   1. 20 Goodyear, Irvine, CA 92618.
   2. Website: www.navieninc.com.
   3. Phone: (800) 519-8794.

B. Provide products by one of the following manufacturers subject to compliance with the requirements below:
   1. Navien Inc.
   2. Or Equal.

C. Substitution Limitations:
   1. Submit substitution requests in accordance with provisions of Section 01 60 00.
   2. Single manufacturer to provide, from a single source, primary products and accessories specified in this section.

2.2 PERFORMANCE REQUIREMENTS

A. Certifications: Provide products with heat exchanger that has the following certification labels.
   1. ANSI and CSA marks for the United States and Canada.
   2. AHRI certification for the United States and Canada.
   3. UL certification controller for recovery and external recirculation marks for the United States and Canada.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by an NRTL, and marked for intended location and use.

C. ASHRAE/IES Compliance: Fabricate and label fuel-fired, domestic-water heaters to comply with ASHRAE/IES 90.1.
   1. Comply with efficiency requirements in ASHRAE 189.1, which supersede requirements in ASHRAE/IESNA 90.1.

D. NSF Compliance: Fabricate and label equipment components that will be in contact with potable water to comply with NSF 61 and NSF 372.

E. Energy Star Compliance: Fabricate and label equipment in compliance with Energy Star requirements.
   1. Special Requirements: NSF 5 construction.

F. High Altitude: approved up to 10,200 ft or (3,109 m).

G. SCAQMD Rule 1146.2 Type 1 Compliance: Provide units with low nitrous oxide emissions that meet or exceed 14 ng/j or 20 ppm NOx requirements at 3%.

2.3 SYSTEM REQUIREMENTS

A. General: Provide tankless condensing water heater with microprocessor control and a direct electronic ignition system (with no standing pilot), fully modulating gas control valve, turbine flow meter, automatic electro-mechanical water flow control valve, and water temperature thermistors to maintain outlet water temperature between ± 2°F of set point temperature. Microprocessor shall have built in recirculation logic to control a pump's heating cycles.

B. Controls: Provide an integrated temperature thermostat with an adjustable set point range of 96°F to 185°F.

C. Error Memory: Provide water heater with no less than nine diagnostic maintenance codes that can be read via the display on the temperature thermostat controller.

D. Emissions: Provide water heater that produces no more than 20 ppm NOx emissions when tested in accordance with the rules and regulations of the South Coast Air Quality Management District.

E. Burners: Provide tankless water heater with downward fired fiber mesh burners, solid brass water flow control valve, and solid brass inlet and outlet water connections.

F. Junction Box: Provide pre-installed electrical junction box.

G. Heat Exchanger Construction: 400 series stainless steel.

2.4 INDOOR TANKLESS GAS WATER HEATERS.

A. General: ANSI Z21.10.3/CSA 4.3 for gas-fired, hybrid, domestic-water heaters for indoor application.
   1. Basis of Design Product: Navien NPE, Model 150S2.
   2. Uniform Energy Factor: 0.93.
   3. Temperature Setting Range: 97 to 185 degrees F (36 to 85 degrees C).
   4. Fuel: Natural Gas or Propane.
      a. Gas Consumption: 18,000 to 120,000 Btu/hr.
      b. Gas Supply Pressure:
         1) Natural Gas: 3.5 to 10.5 inches of water column.
         2) Propane: 8.0 to 13.5 inches of water column.
   5. Electrical: Provide 120 V/60 Hz AC power source, with consumption as follows:
      a. Normal Usage: 52 Watts.
      b. Max Current: 4 Amps.
   6. Hot Water Flow Rate Capacity: 6.8 GPM at 35°F temperature rise.
   7. Pressure Rating: 150 psi
   8. Heat Exchanger: Dual, stainless steel heat exchangers.
   9. Freeze Protection: For ambient temperatures as low as –5°F.

2.5 ACCESSORIES

A. Venting System: Exhaust manifold shall be a minimum of 3", of either polypropylene or schedule 40 PVC/CPVC with horizontal or vertical termination.
   1. Provide common vent system allowing up to twelve (12) units to vent through 6" vent diameter in the same system.

2. Provide system capable of configuring vent intake and exhaust in different pressure planes.

B. Exhaust damper: provide common vent system with dampers that allows venting without check valves.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin work until adjacent substrates have been properly prepared to receive work specified in this section.

B. Verify that locations of concealed reinforcements have been clearly marked for the installer.

C. Locate reinforcement points and clearly mark their locations if not already done.

3.2 PREPARATION

A. Clean surfaces prior to installation.

B. Protect all adjacent surfaces from possible damage during installation of units.

C. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

A. Coordinate with plumbing piping, fuel piping, and related electrical work to achieve operating system.

B. Install in accordance with manufacturer’s current installation instructions, industry recognized best practices, and all code bodies having jurisdiction; do not install damaged products.

C. Test for proper operation and adjust until satisfactory results are obtained, including start-up and check out procedures as recommended by the manufacturer.

D. Protect adjacent finishes from damage during installation using manufacturer’s recommendations.

3.4 CLEANING AND PROTECTION

A. Clean and remove all grime or other soils using manufacturer’s recommended methods.

B. Damaged products must be repaired or replaced prior to substantial completion.

C. Protect installed products until completion of work specified in this section.

END OF SECTION

SECTION 22 4000 - PLUMBING FIXTURES

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes plumbing fixtures and trim, faucets, other fittings, and related components.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 7 Section "Joint Sealants" for sealing between fixtures and walls, floors, and counters.
2. Division 22 Section "General Duty Valves for Plumbing Piping" for general-duty valves used as supply stops.
3. Division 22 Section "Domestic Water Piping Specialties" for backflow preventers and other specialties not specified in this Section.

1.3 DEFINITIONS

A. Accessible: Plumbing fixture, building, facility, or portion thereof that can be approached, entered, and used by physically handicapped, disabled, and elderly people.

B. Fitting: Device that controls flow of water into or out of plumbing fixture. Fittings specified in this Section include supplies and stops, faucets and spouts, shower heads and tub spouts, drains and tailpieces, traps and waste pipes. Pipe fittings, tube fittings, and general-duty valves are included where indicated.

1.4 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for each plumbing fixture category and type specified. Include selected fixture, trim, fittings, accessories, appliances, appurtenances, equipment, and supports. Indicate materials and finishes, dimensions, construction details, and flow-control rates.

C. Wiring diagrams from manufacturer for electrically operated units.

D. Maintenance data for plumbing fixtures and components to include in the operation and maintenance manuals specified in Division 1.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain plumbing fixtures, faucets, and other components of each category from one source and by a single manufacturer.

1. Exception: Where fixtures, faucets, or other components are not available from a single manufacturer, obtain similar products from other manufacturers specified for this category.

B. Regulatory Requirements: Comply with requirements of Architectural and Transportation Barriers Compliance Board's (ATBCB) "Uniform Federal Accessibility Standards (UFAS), 1985-494-187" regarding plumbing fixtures for physically handicapped people.

C. Energy Policy Act Requirements: Comply with requirements of Public Law 102-486, "Energy Policy Act," regarding water flow rate and water consumption of plumbing fixtures.

D. Listing and Labeling: Provide electrically operated fixtures and components specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

E. Select combinations of fixtures and trim, faucets, fittings, and other components that are compatible.

F. Product Options: Drawings indicate size, profiles, dimensional requirements, and characteristics of plumbing fixtures and are based on specific types and models indicated. Other manufacturers' fixtures with equal performance characteristics may be considered. Refer to Division 1 Section "Substitutions."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver plumbing fixtures in manufacturer's protective packing, crating, and covering.

B. Store plumbing fixtures on elevated platforms in dry location.

1.7 PROJECT CONDITIONS

A. Field Measurements: Coordinate roughing-in and final fixture locations and verify that plumbing fixtures can be installed to comply with original design and referenced standards.

PART 2 - PRODUCTS

2.1 PLUMBING FIXTURE STANDARDS

A. Comply with applicable standards below and other requirements specified.

1. Electric Water Coolers: ARI 1010 and UL 399.
2. Emergency Equipment: ANSI Z358.1.
3. National Sanitation Foundation Construction: NSF 2.
4. Plastic Mop-Service Basins: ANSI Z124.6.
5. Plastic Shower Enclosures: ANSI Z124.2 and ANSI Z124.2a.
6. Semivitreous Ceramic Fixtures: ASME A112.19.9M.
7. Vitreous-China Fixtures: ASME A112.19.2M.

a. Exception: ASME A112.19.9M, semivitreous, ceramic fixtures, except water-closet bowls and urinals with integral traps, may be furnished instead of vitreous-china fixtures.

8. Water-Closet, Flushometer Tank Trim: ASSE 1037.

2.2 LAVATORY/SINK FAUCET STANDARDS

A. Comply with ASME A112.18.1M and other requirements specified for lavatory, sink, and similar-type-fixture faucet fittings. Include hot- and cold-water indicators; 2.5-gpm- (0.16-L/s-) maximum flow rate; and polished, chrome-plated finish; except where otherwise indicated. Coordinate faucet inlets with supplies and fixture holes and outlet with spout and fixture receptor.

1. Diverter Valves for Faucets with Hose Spray: ASSE 1025.
2. Faucet Hose: ASTM D 3901.
3. Hose-Connection Vacuum Breakers: ASSE 1011.
4. Hose-Coupling Threads: ASME B1.20.7.
5. Integral, Atmospheric Vacuum Breakers: ASSE 1001.
6. Pipe Threads: ASME B1.20.1.
7. Sensor-Actuated Faucets and Electrical Devices: UL 1951.
8. Sink Spray Hoses: ASTM D 3573.

2.3 MISCELLANEOUS FITTING STANDARDS

A. Comply with ASME A112.18.1M and other requirements specified for fittings, other than faucets. Include polished, chrome-plated finish, except where otherwise indicated. Coordinate fittings with other components and connectors.

1. Atmospheric Vacuum Breakers: ASSE 1001.
2. Automatic Flow Restrictors: ASSE 1028.
3. Brass and Copper, Supplies and Tubular Brass: ASME A112.18.1M.
4. Fixed Flow Restrictors: ASSE 1034.
5. Manual-Operation Flushometers: ASSE 1037.
6. Plastic Tubular Fittings: ASTM F 409.

2.4 MISCELLANEOUS COMPONENT STANDARDS

A. Comply with applicable standards below and other requirements specified for components for plumbing fixtures, equipment, and appliances.

1. Floor Drains: ASME A112.21.1M.
2. Hose-Coupling Threads: ASME B1.20.7.
3. Hot-Water Dispensers: ASSE 1023 and UL 499.
4. Pipe Threads: ASME B1.20.1.
5. Plastic Shower Receptors: ANSI Z124.2 and ANSI Z124.2a.
6. Plastic Toilet Seats: ANSI Z124.5.
7. Supply and Drain Insulation Kits: CABO A117.1.
8. Supports: ASME A112.6.1M.

2.5 FITTINGS

A. Fittings for Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for materials for supplies, supply stops, supply risers, traps, and other fittings.

B. Fittings for Equipment Specified in Other Sections: Fittings include the following:

1. Supply Inlets: Brass pipe or copper tube, size required for final connection.

2. Supply Stops: Chrome-plated brass, angle or straight; compression, wheel-handle type; same size as supply inlet and with outlet matching supply riser.

3. Supply Risers: 3/8-inch NPS (DN10) flexible copper tube with knob end. Use chrome-plated tube for exposed applications.

4. Traps: Tubular brass with 0.045-inch (1.1 mm) wall thickness, slip-joint inlet, cleanout, wall flange, escutcheons, and size to match equipment. Use chrome-plated tube for exposed applications.

5. Continuous Waste: Tubular plastic with slip-joint inlet and size to match equipment.

6. Indirect Waste: Tubular plastic and size to match equipment.

2.6 PRESSURE ASSIST WATER CLOSETS

A. Water Closet Manufacturers:
1. American Standard Inc.
2. Kohler Company
3. Crane

2.7 VITREOUS CHINA LAVATORIES AND SINKS

A. Lavatory Manufacturers:
1. American Standard Inc.
2. Kohler Company
3. Chicago Faucet

B. Faucet Manufacturers:
1. Kohler
2. Chicago Faucet
3. American Standard

2.8 STAINLESS STEEL SINKS

A. Sink Manufacturers:
1. American Standard Inc.
2. Kohler Company
3. Elkay

B. Faucet Manufacturers:
1. Kohler
2. Chicago Faucet
3. American Standard

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for potable, hot- and cold-water supply piping systems; soil, waste, and vent piping systems; and supports. Verify that locations and sizes of piping and locations and

types of supports match those indicated, before installing and connecting fixtures. Use manufacturer's roughing-in data when roughing-in data are not indicated.

B. Examine walls, floors, and cabinets for suitable conditions where fixtures are to be installed.

C. Do not proceed until unsatisfactory conditions have been corrected.

3.2 APPLICATIONS

A. Include supports for plumbing fixtures according to the following:

1. Carriers: For wall-hanging water closets and fixtures supported from wall construction.
2. Chair Carriers: For wall-hanging urinals, lavatories, sinks, drinking fountains, and electric water coolers.
3. Heavy-Duty Chair Carriers: For accessible urinals, lavatories, and other fixtures where indicated.
4. Reinforcement: For floor-mounted lavatories and sinks that require securing to wall and recessed, box-mounted, electric water coolers.

5. Fabricate reinforcement from 2-by-4-inch or 2-by-6-inch (38-by-89-mm or 38-by-140-mm) fire-retardant-treated-wood blocking between studs or 1/4-by-6-inch (6.35-by-152.4-mm) steel plates attached to studs, in wall construction, to secure fixtures to wall. Include length that will extend beyond ends of fixture mounting bracket and attach to at least 2 studs.

B. Include fitting insulation kits for accessible fixtures according to the following:

1. Lavatories: Cover hot- and cold-water supplies, stops and handles, drain, trap, and waste to wall.
2. Sinks: Cover hot- and cold-water supplies, stops and handles, drain, trap, and waste to wall.
3. Fixtures with Offset Drain: Cover hot- and cold-water supplies, offset drain, trap, and waste to wall.
4. Other Fixtures: Cover exposed fittings below fixture.

3.3 PLUMBING FIXTURE INSTALLATION

A. Assemble plumbing fixtures and trim, fittings, faucets, and other components according to manufacturers' written instructions.

B. Install fixtures level and plumb according to manufacturers' written instructions, roughing-in drawings, and referenced standards.

C. Install floor-mounted, floor-outlet water closets with closet flanges and gasket seals.

D. Install toilet seats on water closets.

E. Install wall-hanging, back-outlet urinals with gasket seals.

F. Install flushometer valves for accessible water closets and urinals with handle mounted on wide side of compartment. Install other actuators in locations that are easy for handicapped people to reach.

G. Install tanks for accessible, tank-type water closets with lever handle mounted on wide side of compartment.

H. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.

I. Fasten floor-mounted fixtures to substrate. Fasten fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.

J. Fasten recessed, wall-mounted fittings to reinforcement built into walls.

K. Fasten wall-mounted fittings to reinforcement built into walls.

L. Fasten counter-mounting plumbing fixtures to casework.

M. Secure supplies to supports or substrate within pipe space behind fixture.

N. Set shower receptors and mop basins in leveling bed of cement grout.

O. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.

1. Exception: Omit stop valves on supplies to emergency equipment, except when permitted by authorities having jurisdiction. When permitted, install valve chained and locked in OPEN position.

P. Install water-supply stop valves in accessible locations.

Q. Install faucet, laminar-flow fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

R. Install supply, flow-control fittings with specified flow rates in fixture supplies at stop valves.

S. Install faucet, flow-control fittings with specified flow rates and patterns in faucet spouts when faucets are not available with required rates and patterns. Include adapters when required.

T. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, except where otherwise indicated.

U. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.

V. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant according to sealing requirements specified in Division 7 Section "Joint Sealants." Match sealant color to fixture color.

3.4 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:

1. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 22 Sections.

B. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedules at the end of this Section for fitting sizes and connection requirements for each plumbing fixture.

C. Supply and Waste Connections to Equipment Specified in Other Sections: Connect equipment with supply inlets, supply stops, supply risers, and traps specified in this Section. Use fitting sizes required to match connected equipment. Connect fittings to plumbing piping.

D. Ground equipment.

1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

E. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 26 Sections. Plumbing contractor shall include any necessary wiring in their bid.

3.5 FIELD QUALITY CONTROL

A. Verify that installed fixtures are categories and types specified for locations where installed.

B. Check that fixtures are complete with trim, faucets, fittings, and other specified components.

C. Inspect installed fixtures for damage. Replace damaged fixtures and components.

D. Test installed fixtures after water systems are pressurized and demonstrate proper operation. Replace malfunctioning fixtures and components, then retest. Repeat procedure until units operate properly.

3.6 ADJUSTING AND CLEANING

A. Operate and adjust faucets and controls. Replace damaged and malfunctioning fixtures, fittings, and controls.

B. Operate and adjust disposers, hot-water dispensers, and controls. Replace damaged and malfunctioning units and controls.

C. Adjust water pressure at drinking fountains, electric water coolers, faucets, shower valves, and flushometer valves having controls, to produce proper flow and stream.

D. Replace washers and seals of leaking and dripping faucets and stops.

E. Clean fixtures, faucets, and other fittings with manufacturers' recommended cleaning methods and materials. Include the following:

1. Remove faucet spouts and strainers, remove sediment and debris, and reinstall strainers and spouts.
2. Remove sediment and debris from drains.

3.7 PROTECTION

A. Provide protective covering for installed fixtures and fittings.

B. Do not allow use of fixtures for temporary facilities, except when approved in writing by Owner.

END OF SECTION 22 4000

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SECTION 23 0100 – BASIC MECHANICAL REQUIREMENTS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary conditions, (if any) and other General Requirements, apply to the work specified in this section.

B. Separation of Division 23 into Sections is for convenience only and is not intended to establish limits of work. Sections are as follows:

1. 230100 Basic Mechanical Requirements
2. 230500 Common Work Results for HVAC
3. 230517 Sleeves and Sleeve Seals for HVAC Piping
4. 230529 Hangers and Supports for HVAC Piping and Equipment
5. 230548 Vibration and Seismic Controls for HVAC Piping and Equipment
6. 230553 Identification for HVAC Piping and Equipment
7. 230593 Testing, Adjusting, and Balancing for HVAC
8. 232300 Refrigerant Piping
9. 233113 Metal Ducts
10. 233300 Air Duct Accessories
11. 233423 HVAC Power Ventilators
12. 233713 Diffusers, Registers, and Grilles
13. 238128 Ductless Split-System Air-Conditioners

1.2 SUMMARY

A. This Section includes general administrative and procedural requirements for mechanical installations and expands the requirements specified in Division 1. These requirements are: Contractor's Qualifications, Quality Assurance, Reference Codes and Standards, Permits and Inspections, Equipment and Materials, Examination of Premises, Submittals, Coordination Drawings, Record Documents, Project Closeout, Warranty, Measurements, Operation Prior to Substantial Completion, Contractor Operation Prior to Substantial Completion, Electrical Work, Painting, Protection of Equipment and Work, Rough-ins, Mechanical Installations, and Cutting and Patching.

1.3 DEFINITIONS

A. The following definitions apply to all Division 23 specification sections:

1. Furnish: Except as otherwise defined in greater detail, term "furnish" is used to mean supply and deliver to project site, ready for unloading, unpacking, assembly, installation, etc., as applicable in each instance.
2. Install: Except as otherwise defined in greater detail, term "install" is used to describe operations at project site including unloading, unpacking, assembly, erection, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning and similar operations, as applicable in each instance.
3. Provide: Except as otherwise defined in greater detail, term "provide" means furnish and install, complete and ready for intended use, as applicable in each instance.
4. Installer: The term "Installer" is defined as the entity (person or firm) engaged by the Contractor or its subcontractor or sub-subcontractor for performance of a particular unit of work at the project site, including installation, erection, application and similar required operations. Installers shall be skilled in the work they are to perform.

5. Specialist: The term "Specialist" means an individual or firm of established reputation (or, if newly organized, whose personnel have previously established a reputation in the same field), which is regularly engaged in, and which maintains a regular force of workmen skilled in either (as applicable) manufacturing or fabricating items required by the contract, installing items required by the contract, or otherwise performing work required by the contract. Where the contract specification requires installation by a specialist, that term shall also be deemed to mean either the manufacturer of the item, an individual or firm licensed by the manufacturer, or an individual or firm who will perform the work under the manufacturer's direct supervision.
6. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct shafts, unheated spaces immediately below the roof, spaces above ceilings, unexcavated spaces, crawl spaces, and tunnels.
7. Exposed Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.
8. Exposed Exterior Installations: Exposed to view outdoors, or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.
9. Concealed Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and in duct shafts.
10. Concealed Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants, but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.4 SCOPE

A. The following requirements apply to the work necessary to provide air conditioning system or systems, as specified in the various sections of this Division.

1.5 CONTRACTOR'S QUALIFICATIONS

A. An acceptable contractor for the work under this Division shall be a specialist in this field and have the personal experience, training and skill and the organization to provide a practical working system. If required, he shall be able to furnish acceptable evidence of having contracted for and installed not less than 3 systems of comparable size and type to this one, that have served their owners satisfactorily for not less than 3 years. The foreman for this work shall have had experience in installing not less than 3 such systems and shall be approved before work is begun.

1.6 QUALITY ASSURANCE

A. Manufacturers:
   1. Trade names, manufacturers and catalog numbers are mentioned herein and on the Drawings solely in order to establish a standard for the type, general design and quality of product required. Other products similar in design, of equal quality and complying with the Drawings and Specifications will be considered after the contract is let only for those items with which the expression "or approved equal" is used. Where two or more manufacturers or materials are named, the Contractor may submit any of those named, provided they conform to the Specification. Identification in the project documents of any product by name, manufacturer or model number does not include either expressed or implied warranty of unqualified product acceptance. All products must be capable of proper installation in the spaces provided, readily maintained and must satisfy other requirements contained in the contract documents.

   2. If manufacturer and/or model number is indicated in the Contract Documents, it is for the purpose of identifying the product that is the “Basis of Design”. This means the product has been used as the basis for coordination for all architectural, structural, electrical, &

mechanical requirements. If a manufacturer and/or model number other than the one named is procured, the Contractor shall be responsible for all changes necessary including additional design services incurred by the Owner to allow the installation of the selected product. It shall be the Owner's sole discretion to determine if additional design assistance is needed. Owner shall be compensated by the Contractor for the cost of the additional service to the Architect and/or Engineer to change the design and/or review the equipment placement changes elected to be made by the Contractor.

1.7 REFERENCE CODES AND STANDARDS

A. Requirements set forth in reference codes and standards are minimum for equipment, material and work. In instances where capacities, size, etc., of equipment, devices or materials listed in the Contract Documents exceed these minimums, listed or shown capacities, etc. shall prevail.

B. Comply with applicable laws, ordinances, codes and rules, with latest revisions adopted, of the following governing codes and agencies:

1. International Mechanical Code
2. Building Code of the local AHJ
3. Fire Marshal of the State of Ohio
4. Ohio Plumbing Code, Current Edition
5. International Energy Conservation, Current Edition

C. Industry standards and specifications issued by the following organizations shall apply to materials and workmanship:

1. AMCA Air Moving and Conditioning Association
2. ASME American Society of Mechanical Engineers
3. ASHRAE American Society of Heating, Refrigeration and Air Conditioning Engineers
4. ETL Engineering Testing Laboratory
5. NEMA National Electrical Manufacturers' Association
6. NFPA National Fire Protection Association
7. SMACNA Sheet Metal and Air Conditioning Contractors' National Association
8. UL Underwriters' Laboratories, Inc.

D. Local laws and codes take precedence over state laws and codes, which, in turn, take precedence over national codes and industry standards.

E. Comply with the rules and regulations of the "Safety Code for Mechanical Refrigeration", (ANSI/ASHRAE 15-2007). Meet the requirements of the ASME Unfired Pressure Vessel Code. All pressure vessels shall be stamped "ASME" and "National Board". Furnish to the Owner for each pressure vessel supplied under this Specification, a manufacturer's data report for unfired pressure vessels, Form U-I, as required by the ASME Code Rules.

F. This form must be signed by a qualified inspector holding a National Board Commission, certifying that construction conforms to the latest ASME Code for Unfired Pressure Vessels. The ASME symbol "U" also shall be stamped on each vessel.

1.8 PERMITS AND INSPECTIONS

A. Permits and Fees: Obtain and pay for all permits. Pay fees and all other payments required by utility regulatory bodies in connection with the Work. Pay for all inspections required under local codes with regard to the Work.

B. Certificates of Inspection: Upon completion of the work, furnish certificates of inspection from all inspection or regulatory agencies having jurisdiction over work of Division 23.

1.9 EQUIPMENT AND MATERIALS

A. Each item of equipment shall bear a name plate showing the manufacturer's name, trade name, model number, serial number, ratings and other information necessary to fully identify it. The plate shall be permanently mounted in a prominent location and shall not be concealed, insulated or painted.

B. The label of the approving agency, such as UL, AGA, ASME, ARI, AMCA, by which a standard has been established for the particular item, shall be in full view.

C. The equipment shall be essentially the standard product of a manufacturer regularly engaged in the production of such equipment and shall be the manufacturer's latest design.

D. Deliver equipment and materials to the site and store in original containers, suitably sheltered from physical damage and the elements, but readily accessible for inspection. Equipment damaged in shipment will not be acceptable.

1.10 EXAMINATION OF PREMISES

A. Visit the site of the proposed work before bidding. Inspect the site and become familiar with the difficulties and restrictions attending the execution of the contract.

B. No additional compensation will be allowed for failure to be informed of site conditions.

1.11 SUBMITTALS:

A. General:

1. Submit for review shop drawings, product data and samples. Comply with requirements of Division 1 Section "Submittals". Minimum number of copies shall be four (4). Mark each individual item with pertinent specification section and paragraph number. Submittal will be rejected if specification and paragraph number under which it is being submitted is not identified.

2. If the submittal deviates from the requirements of the Contract Documents, the deviation shall be identified in writing on the first page of the submittal. Identify where within the Contract Documents the deviation occurs. The deviation shall only be considered acceptable if the identified deviation has been initialed by the Engineer. Any deviation not initialed may be assumed to be rejected. All coordination required due to the deviation, such as space allocation, changes to electrical service, or any other required changes shall be born as Work of Division 23 but accomplished by Installers skilled in the Work being performed. No costs incurred by the approved deviation shall be born by the Owner.

3. Review of shop drawings and submittals does not relieve the Contractor of responsibility for compliance with the specific requirements of the Contract Documents, or for fitting the equipment in the space allotted, with proper space for connection of piping or ductwork and for servicing or for coordination of the work with work of other trades. Approval of deviations also does not relieve the Contractor of responsibility for compliance with all other aspects of the Contract Documents.

4. Review is for general conformance with the design concept of the project and general compliance with the information given in the project documents. Responsibility for confirming and correlating all quantities and dimensions, selecting fabrication processes and establishing techniques of construction resides with Contractor. Review subcontractors' submittals and shop drawings and indicate by rubber stamp or letter that they have been reviewed and approved before forwarding them. Submittals and Drawings will be returned after review indicating whether or not exceptions are taken and the required procedure to be followed thereafter. Revised and acceptable submittals and shop drawings are required before construction is begun. Include dimensional data and weights of equipment. Include motor manufacturers' names.

5. In general, the Architect and/or his consultants will review each submittal as indicated above. If submittal does not comply with the Contract Documents as indicated by the submittal being marked "REJECTED" and "RESUBMIT", be responsible to the Owner for any additional costs the Owner incurs due to review of follow-on submittals.

B. Samples:

1. Submission of samples may be required by the Architect, particularly where equipment is visible in finished areas. Arrange demonstrations of a product's ability to perform as specified if required. Include dimensional data and weights of equipment. Include motor manufacturers' names.

C. Shop Drawings:

1. Shop drawings shall consist of plans, sections, elevations and details to scale (no smaller than 1/4" per foot), with dimensions clearly showing the installation. Direct copies of small scale project drawings issued to the Contractor are not acceptable. Drawings shall take into account equipment furnished under other Divisions and shall show space allotted for it. Include construction details and materials. As a minimum, submit shop drawings covering equipment rooms, equipment foundations, equipment supports, ductwork, field-fabricated equipment, piping or any other drawings specifically called for in this and other Sections. Include the following:

    a. Controls and instrumentation, including complete electrical interlock.
    b. Built-up equipment.
    c. Equipment rooms (any room in which there is Division 23 equipment)
    d. Equipment housekeeping pads, and vibration isolation.
    e. Field-fabricated hangers, supports, guides and anchors.
    f. Piping & Ductwork Layouts.

D. The drawings show existing construction components and systems as on record by the Owner. As part of the shop drawing process, field verifies location and size of structural members, location of partitions, and existing systems shown. If field measurements differ from the information on the drawings which causes a conflict in the Work, promptly consult the Architect for resolution. The Owner shall not be responsible for any delays in construction due to the Contractor failing to field verify information shown on the drawings as existing.

E. Product Data:

1. Submit product data within 45 days after award of the Contract and before any equipment or materials are purchased. Product data is defined as manufacturers' printed literature specifically marked to indicate size and model and accompanied by rating sheets listing values showing that equipment meets scheduled or specified values. Properly coded stamp

"No exception taken" on submittal is required before ordering equipment unless otherwise noted.

2. Submit items identified in the individual Sections. If product data have not been received within 45 days after award of the Contract, only the manufacturer named shall be allowed e.g. if "American Standard or approved equal" is stated in the Contract Documents, after 45 days only the American Standard product shall be allowed, or if the scheduled equipment on the drawings indicates "Loren-Cook" for fans, after 45 days only Loren-Cook products shall be allowed.

1.12 COORDINATION DRAWINGS

A. Prepare coordination drawings in accordance with Division 1 Section "Project Coordination" and as follows. Drawings shall be to a minimum scale of 1/4" = 1'-0" detailing major elements, components, and systems of mechanical equipment and materials in relationship with other building systems, installations, and components. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work.

B. Indicate the proposed locations of piping, ductwork, equipment, and materials and include vertical measurement from floor to bottom of piping, ductwork, and elevated equipment. Piping drawings shall include access panel locations, valves, sleeves, location of supports, etc. Ductwork drawings shall include access panel locations (in duct and building construction to obtain entry to service and maintain duct mounted equipment), vanes, scoops, splitters, dampers, grilles, diffusers, coils, etc. Vertical measurement shall be indicated at all changes in direction of piping and ductwork. Measurement shall be made to the outside surface of exterior insulated ducting and piping. Measurements shall include clearances for installing and maintaining insulation; servicing and maintaining equipment; space for equipment disassembly for periodic maintenance; and showing areas for tube, filter, and coil removal. Provide details of connections and supports, exterior wall and foundation penetrations, sizes and locations of concrete housekeeping pads, and indicate space for valve stem movement. Indicate scheduling, sequencing, movement, and positioning of large equipment into the building during construction.

C. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations. Include location of sleeves in floors, walls, and ceilings. Prepare reflected ceiling plans to coordinate and integrate installations, air outlets and inlets, light fixtures, communication system components, sprinklers, smoke detectors, and other ceiling mounted items.

D. Provide digital copies of final coordination drawings, separated by trade, to the owner in dwg and/or pdf file formats.

E. Mechanical ductwork priority over all other systems being installed (MEP) above ceiling. Rerouting of installed systems due to uncoordinated drawings is the responsibility of the general contractor.

1.13 RECORD DOCUMENTS

A. Prepare record documents in accordance with the requirements in Division 1 Section "Project Closeout". As a minimum, record documents shall show ductwork; locations of dampers and other control devices; filters, boxes, and terminal units requiring periodic maintenance or repair; piping systems with valves and control devices located and numbered according to tags; concealed unions and items requiring maintenance such as traps, strainers, expansion compensators, expansion and compression tanks. Locate all access panels installed to maintain mechanical equipment. Reference prominent building lines when showing dimensions of

equipment, pipe, ducting, and access panels. Identify installations different from the original plans due to product substitutions, Contract Modifications, and actual equipment and material installed. All elements underground shall be shown giving actual inverts and horizontal locations. Engage the services of a Land Surveyor or Professional Engineer registered in the State in which the project is located to record locations and invert elevations of underground installations. Complete this survey work prior to the covering of the underground installation.

B. Provide digital copies of final record documents, separated by trade, to the owner in dwg and/or pdf file formats.

1.14 PROJECT CLOSEOUT

A. Mark and otherwise correct a set of reproducible drawings to reflect the final location of all work installed under Division 23, to serve as record documents, in accordance with Division 1 Section "Project Closeout". Locate cleanouts, valves, traps, manual and automatic dampers, fire and smoke dampers, control sensing elements in ducts, and other concealed items requiring adjustment or maintenance. Supplement with additional sketches on tracing paper for clarification, if necessary. Certify in writing that record drawings have been checked and are accurate. Submittal of these documents is a prerequisite for certification of substantial completion. Contractor may obtain a set of reproducible drawings from the Architect and shall pay for them.

B. Conform to other requirements included in Division 1 Section, "Project Closeout".

1.15 WARRANTY

A. Refer to applicable paragraph under GENERAL CONDITIONS. Warrant all materials and workmanship for a period of five years. Repair or replace promptly defects due to faulty materials, methods of installation or workmanship, with the least inconvenience and without expense to the Owner and at time designated by the Architect within the five-year period. Additional specific performance or extended time warranties called for in the individual sections under this Division must be provided.

B. The warranty period for mechanical work shall commence on the date certified by the architect or engineer that the contract is substantially complete in accordance with the plans and specifications, or upon beneficial use by the Owner, whichever occurs first. When beneficial use is for only a portion of the work, the warranty shall commence only on that portion of the work.

1.16 MEASUREMENTS

A. Because of the small scale of the Drawings, it is not possible to indicate all offsets and fittings or to locate every accessory. Study carefully the sizes and locations of structural members, wall and partition locations, attic spaces, ceiling furring, chase spaces and room dimensions and take actual measurements on the job. Locate ductwork, piping, equipment and accessories, with sufficient space for installing, insulating and servicing. Contractor is responsible for accuracy of his measurements and shall not order materials or perform work without verification. No extra compensation will be allowed because field measurements vary from the dimensions on the Drawings. If field measurements show that equipment, piping or ductwork can not be fitted, the Architect shall be consulted. All equipment, apparatus and materials must fit into the available, designated spaces, with proper clearances for maintenance, service and repair.

1.17 OPERATION PRIOR TO SUBSTANTIAL COMPLETION

A. Owner shall have the right to operate systems and equipment prior to substantial completion, as soon as tested and operational, provided all safety devices have been installed. Agreement

between Owner and Contractor relative to time and hours of operation and responsibility for start up and shutdown is required. Do not permit operation which may damage equipment or cause damage to the building or to the work of other contractors. Air filters must be in place on air conditioning units and strainers must be in place in all piping systems prior to operation.

1.18 CONTRACTOR OPERATION PRIOR TO SUBSTANTIAL COMPLETION

A. Obtain written authorization from the Owner for Contractor's use of equipment. If equipment is allowed to be used during construction period, all start-up requirements for the equipment shall be adhered to prior to operation including start-up procedures, required equipment check-out by factory authorized representatives, required equipment inspection reports, and commissioning as required in the individual Sections. A copy of operating and maintenance manuals shall be kept on-site while equipment is in operation. These manuals shall be made available to Owner's maintenance crews if Contractor is off-site and equipment is still in operation. In addition, no sooner than seven days prior to Substantial Completion being granted, original equipment check-out by factory authorized representative, required equipment inspection reports, and commissioning shall be completed a second time. Equipment or components found not in compliance with the Contract Documents shall be replaced without cost to the Owner. Submit by letter to the Owner the date in which each piece of equipment is put into operation.

B. Maintain duct cleanliness during air handling equipment use by installing minimum 30% filter material over all return and exhaust openings. If duct cleanliness is found by the Architect to be unacceptable, duct shall be cleaned with alcohol impregnated pad and pad changed as it loads with dirt. Provide additional access panels within the ductwork allowing cleaning to be completed. Added access panels required for this remedial cleaning shall be provided at no cost to the Owner.

1.19 ELECTRICAL WORK

A. General:

1. Electrical service shall be as indicated on the Drawings. All power wiring and all circuit breakers, starters, disconnect switches, pilot lights, hand-off-automatic (H-O-A) switches, pushbutton stations, except such items which are provided as part of "packaged" mechanical equipment or specifically noted herein, shall be furnished, set in operating position, and electrically connected as work of DIVISION 26, ELECTRICAL.

2. Should the Contractor desire to use equipment requiring larger motors or electrical characteristics differing from those shown, it is the responsibility of work requirements under Division 23 to inform other affected parties of the proposed changes to permit them to supply proper wiring, disconnects and starters. Additional costs incurred to work of other Divisions caused by such changes shall be borne as work of Division 23. Coordination to establish areas of possible change between Division 23 work and work of another Division shall occur prior to equipment delivery from the manufacturer.

B. Starters: Motor starters furnished with mechanical equipment covered by this section shall conform to the requirements of Division 26. Provide motor overload protection requirements for sizing overload protection device for motor starters furnished under Division 26.

C. Conduit and Wiring: As work of Division 23, all interlock conduit and wiring and control conduit and wiring shall be provided, and all control elements shall be set in position and connected. Electrical wiring for firestats or smoke detectors which interrupt line voltage power circuits to motors and for wall-mounted thermostats which interrupts line voltage power circuits to motors and interlock from smoke detectors for the shutdown of motors shall be work of Division 23. Provide control transformers and additional relays required for interface with the electrical system. Unless indicated otherwise, power wiring and conduit for all devices shall be work of Division 26.

1.20 PAINTING

A. Painting shall be done under Section 09900, except for touch-up of factory finishes on equipment located inside and outside. Obtain matched color coatings from the manufacturer and apply as directed. Prime coating of certain equipment is specified under individual equipment specification. If corrosion is found during inspection on the surface of any equipment, clean, prime, and paint in accordance with requirements of Section 09900.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION

3.1 PROTECTION OF EQUIPMENT AND WORK

A. Continuously maintain adequate protection of stored materials and installed work. Tightly cover fixtures and equipment, with sheet polyethylene or waterproof tarpaulin as protection against dirt, rust and moisture. Provide heat to equipment being stored to prevent condensation. Do not store materials and equipment outside, directly on the ground, or in areas where it may be subject to physical injury from vehicular traffic or construction machinery. Ductwork, piping andequipment installed under this Division shall not be used by other trades as supports for scaffolds or personnel. Do not deliver controls or other delicate equipment to the job site unless they can be placed in protected areas. At work completion, clean equipment, fixtures, exposed ductwork and piping, including hangers and supports to the Architect's satisfaction.

3.2 ROUGH-IN

A. Verify the final locations for rough-ins with field measurements and with the requirements of the actual equipment to be connected. Refer to equipment specifications in Divisions 2 through 28 for rough-in requirements.

3.3 MECHANICAL INSTALLATIONS

A. Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment with other building components. Verify all dimensions by field measurements. Arrange for chases, slots, and openings in other building components during progress of construction to allow for mechanical installations. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed. Sequence and coordinate installation of large pieces of equipment prior to closing in the building.

B. Coordinate connection of mechanical 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.

C. 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 portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect with a suggested resolution. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building components, where installed exposed. Where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.

D. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components without requiring the removal of permanent construction or disabling the function of a required fire-resistance-rated assembly. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations. Extend grease fittings to an accessible location external to the piece of equipment. Install access panel or doors where equipment is concealed behind finished surfaces. See Division 8 Section "Access Doors" and Division 23 Section for related basic mechanical materials and methods.

E. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope. In general, ductwork shall take precedence over piping. Set system elevations to minimize offsets where systems cross. Make full use of all three dimensions and stack ductwork, equipment, and accessories vertically as required. Remove and relocate, without additional compensation, any item that is installed and is later found to encroach on space assigned to another use.

3.4 CUTTING AND PATCHING

A. General: Perform cutting and patching in accordance with Division 1 Section "Cutting and Patching". Engage experienced Installers in cutting and patching this work. Installers' qualifications refer to the materials and methods required for the surface and building components being patched. See Division 1 Section "Definitions and Standards" for definition of "experienced Installer". Protect adjacent installations during all cutting and patching operations.

B. Perform cutting, fitting, and patching for mechanical equipment and material installation. Uncover work to provide for installation of ill-timed work. Remove and replace defective mechanical work and work not conforming to requirements of the Contract Documents. Install equipment and materials in existing structures. Patch finished surfaces and building components using new materials specified for the original installation and experienced Installers.

C. Upon written instructions from the Architect, uncover and restore work to provide for Architect observation of concealed work covered prior to inspection. Uncovering and restoring work required to be observed by the Architect prior to covering as identified in the Contract Documents will be at no cost to the Owner.

D. Cut, remove, and legally dispose of selected mechanical equipment, components, and materials including but not limited to removal of mechanical piping, heating units, plumbing fixtures and trim, and other mechanical items as identified in the Contract Documents. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

E. Patch existing finished surfaces and building components using new materials matching existing materials and experienced Installers.

END OF SECTION 23 01 00

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Summary: General requirements for motors, hangers and supports, vibration isolation, and meters and gages.

B. Submittals: Product Data for materials and equipment specified in this Section.

PART 2 - PRODUCTS

2.1 MOTORS

A. Motor Characteristics (verify with other trades prior to ordering):

1. Motors 3/4 HP and Larger: Three phase.
2. Motors Smaller Than 3/4 HP: Single phase.
3. Frequency Rating: 60 Hz.
4. Voltage Rating: NEMA standard voltage selected to operate on nominal circuit voltage to which motor is connected.
5. Service Factor: 1.15 for open dripproof motors; 1.0 for totally enclosed motors.
6. Duty: Continuous duty at ambient temperature of 105 deg F and at altitude of 3300 feet above sea level.
7. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
8. Enclosure: Unless otherwise indicated, open dripproof.
9. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

2.2 HANGERS AND SUPPORTS

A. Hanger and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.

B. Building Attachments: Powder-actuated-type, drive-pin attachments with pullout and shear capacities appropriate for supported loads and building materials.

C. Mechanical-Expansion Anchors: Insert wedge-type attachments with pullout and shear capacities appropriate for supported loads and building materials.

2.3 VIBRATION ISOLATION

A. Vibration Supports:

1. Pads: Arranged in single or multiple layers of oil- and water-resistant neoprene, rubber, or hermetically sealed compressed fiberglass of sufficient stiffness for uniform loading over pad area, molded with a nonslip pattern and galvanized-steel baseplates, and factory cut to sizes that match requirements of supported equipment.
2. Mounts: Double-deflection type, with molded, oil-resistant fiberglass, rubber or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and

baseplate for bolting to structure. Provide isolator with minimum 0.5-inch static deflection.

3. Spring Isolators: Freestanding, laterally stable, restrained or open-spring isolators. Provide isolator with minimum 1-inch static deflection.

B. Vibration Hangers:

1. Elastomeric Hangers: Double-deflection type, with molded, oil-resistant rubber or neoprene isolator elements bonded to steel housings with threaded connections for hanger rods. Provide isolator with minimum 0.5-inch static deflection.
2. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression. Provide isolator with minimum 1-inch static deflection.

2.4 PRESSURE GAGES AND TEST PLUGS

A. Pressure Gages: Direct-mounting, indicating-dial type complying with ASME B40.100. Dry metal case, minimum 2-1/2-inch diameter with red pointer on white face, and plastic window. Minimum accuracy 3 percent of middle half of range. Range two times operating pressure.

B. Test Plug: Corrosion-resistant brass or stainless-steel body with two self-sealing rubber core inserts and gasketed and threaded cap, with extended stem for units to be installed in insulated piping. Minimum pressure and temperature rating 500 psig at 200 deg F.

PART 3 - EXECUTION

3.1 MOTOR INSTALLATION

A. Anchor motor assembly to base, adjustable rails, or other support, arranged and sized according to manufacturer's written instructions.

3.2 GENERAL PIPING INSTALLATIONS

A. Install piping free of sags and bends.

B. Install fittings for changes in direction and branch connections.

C. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, and concrete floor and roof slabs.

D. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast-iron pipes for wall sleeves.

E. Comply with requirements in Division 07 Section "Penetration Firestopping" for sealing pipe penetrations in fire-rated construction.

F. Install unions at final connection to each piece of equipment.

G. Install dielectric unions and flanges to connect piping materials of dissimilar metals in gas piping.

H. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in water piping.

3.3 GENERAL EQUIPMENT INSTALLATIONS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components, unless otherwise indicated.

I. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

J. Install equipment to allow right of way for piping installed at required slope.

3.4 HANGERS AND SUPPORTS

A. Comply with MSS SP-69 and MSS SP-89. Install building attachments within concrete or to structural steel.

B. Install hangers and supports to allow controlled thermal and seismic movement of piping systems.

C. Install powder-actuated drive-pin fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.

D. Install mechanical-expansion anchors in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches thick.

E. Comply with requirements in Division 07 Section "Penetration Firestopping" for sealing pipe penetrations in fire-rated construction.

F. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

G. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
2. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4, to allow off-center closure for hanger installation before pipe erection.
3. Adjustable Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
4. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
5. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2.

H. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

3.5 VIBRATION ISOLATION

A. Adjust vibration isolators to allow free movement of equipment limited by restraints.

B. Install resilient bolt isolation washers and bushings on equipment anchor bolts.

I. Install cables so they do not bend across sharp edges of adjacent equipment or building structure.

END OF SECTION 23 05 00

SECTION 23 3113 - METAL DUCTS

PART 1 - GENERAL

1.1 General:

A. Submittals: Submit product data on duct liner, sealing materials, and fire-stopping materials.

B. Comply with NFPA 90A, "Standard for the Installation of Air Conditioning and Ventilating Systems," except as indicated otherwise.

1.2 Products:

A. Sheet Metal Materials, General: Provide the following materials where indicated. Package and mark sheet metal materials as specified in ASTM A 700.

1. Galvanized Sheet Steel: Lock-forming quality, ASTM A 527, Coating Designation G 90, mill phosphatized finish for exposed surfaces of ducts exposed to view.

2. Aluminum Sheets: ASTM B 209, Alloy 3003, Temper H14, sheet form, with standard, one-side bright finish where ducts are exposed to view, and mill finish for concealed ducts.

B. Reinforcement Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum ducts provide reinforcing of compatible materials.

C. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for 36-inch length or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

D. Duct Liner: Comply with NFPA Standard 90A and TIMA Standard AHC-101.

1. Materials: ASTM C 1071, Type II, with coated surface exposed to airstream to prevent erosion of glass fibers.

a. Thickness: 1/2 inch.
b. Thermal Performance: "K-Factor" equal to 0.28 or better, at a mean temperature of 75 deg F.
c. Fire Hazard Classification: Flame spread rating of not more than 25 without evidence of continued progressive combustion and a smoke developed rating of no higher than 50, when tested in accordance with ASTM C 411.

2. Liner Adhesive: Comply with NFPA Standard 90A and ASTM C 916.
3. Mechanical Fasteners: Galvanized steel, suitable for adhesive attachment, mechanical attachment, or welding attachment to duct. Provide fasteners that do not damage the liner when applied as recommended by the manufacturer, that do not cause leakage in the duct, and will indefinitely sustain a 50-pound tensile dead load test perpendicular to the duct wall.

a. Fastener Pin Length: As required for thickness of insulation, and without projecting more than 1/8 inch into the airstream.
b. Adhesive For Attachment of Mechanical Fasteners: Comply with the "Fire Hazard Classification" of duct liner system.

E. Joint and Seam Tape: 2 inches wide, glass-fiber-fabric reinforced.

F. Tape Sealing System: Woven-fiber tape impregnated with a gypsum mineral compound and a modified acrylic/silicone activator to react exothermically with the tape to form a hard, durable, airtight seal.

G. Joint and Seam Sealant: One-part, nonsag, solvent-release-curing, polymerized butyl sealant complying with FS TT-S-001657, Type I; formulated with a minimum of 75 percent solids.

H. Flanged Joint Mastics: One-part, acid-curing, silicone elastomeric joint sealants, complying with ASTM C 920, Type S, Grade NS, Class 25, Use O.

I. Hangers and Supports: Provide the following hanger and support components as indicated:

1. Building Attachments: Concrete inserts, powder actuated fasteners, or structural steel fasteners appropriate for building materials. Do not use powder actuated concrete fasteners for lightweight aggregate concretes or for slabs less than 4 inches thick.
2. Hangers: Galvanized sheet steel, or round, uncoated steel, threaded rod.

    a. Straps and Rod Sizes: Conform with Table 4-1 in SMACNA HVAC Duct Construction Standards, 1985 Edition, for sheet steel width and gage and steel rod diameters.

3. Duct Attachments: Sheet metal screws, blind rivets, or self-tapping metal screws, compatible with duct materials.
4. Trapeze and Riser Supports: Steel shapes conforming to ASTM A 36.

    a. Where galvanized steel ducts are installed, provide hot-dipped-galvanized steel shapes and plates.
    b. For aluminum ducts, provide aluminum support materials, except where materials are electrolytically separated from ductwork.

J. Rectangular Duct Fabrication: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel, in accordance with SMACNA "HVAC Duct Construction Standards," Tables 1-3 through 1-19, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.

1. Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.

3. Static Pressure Classifications: Except where otherwise indicated, construct duct systems to the following pressure classifications:

    a. Supply Ducts: 3 inches water gage.
    b. Return Ducts: 2 inches water gage, negative pressure.
    c. Exhaust Ducts: 2 inches water gage, negative pressure.

4. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gage or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figure 1-4, unless they are lined or are externally insulated.

K. Rectangular Duct Fittings: Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," 1995 Edition, Figures 2-1 through 2-10.

L. Shop Application Of Liner In Rectangular Ducts: Adhere a single layer of indicated thickness of duct liner with 90 percent coverage of adhesive at liner contact surface area. Multiple layers of insulation to achieve indicated thickness is prohibited. Apply a coat of adhesive to liner facing in direction of airflow not receiving metal nosing. Butt transverse joints without gaps and coat joint with adhesive. Fold and compress liner in corners of rectangular ducts or cut and fit to assure butted edge overlapping. Longitudinal joints in rectangular ducts shall not occur except at corners of ducts, unless the size of the duct and standard liner product dimensions make longitudinal joints necessary.

1. Secure liner with mechanical fasteners 4 inches from corners and at intervals not exceeding 12 inches transversely around perimeter, at 3 inches from transverse joints and at intervals not exceeding 18 inches longitudinally.
2. Secure transversely oriented liner edges facing the airstream with metal nosings that are either channel or "Z" profile or are integrally formed from the duct wall at the following locations:

    a. Fan discharge.
    b. Intervals of lined duct preceding unlined duct.

    c. Upstream edges of transverse joints in ducts.

3. Terminate liner with duct buildouts installed in ducts to attach dampers, turning vane assemblies, and other devices. Fabricated buildouts (metal hat sections) or other buildout means are optional; when used, secure buildouts to the duct wall with bolts, screws, rivets, or welds. Terminate liner at fire dampers at connection to fire damper sleeve through fire separation.

M. Round Duct Fabrication: Except where interrupted by fittings, provide round ducts in lengths not less than 12 feet.

1. Round Ducts: Fabricate exposed round supply ducts with spiral lockseam construction, except where diameters exceed 72 inches. Fabricate ducts having diameters greater than 72 inches with longitudinal butt-welded seams. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.
2. Round Ducts: Fabricate concealed round supply ducts using seam types identified in SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figure 3-1, RL-1, RL-4, or RL-5. Seams Types RL-2 or RL-3 may be used if spot-welded on 1-inch intervals. Comply with SMACNA "HVAC Duct Construction Standards," Table 3-2 for galvanized steel gages.

3. 90-Degree Tees and Laterals and Conical Tees: Fabricate to conform to SMACNA "HVAC Duct Construction Standards," 1985 Edition, Figures 3-4 and 3-5 and with metal thicknesses specified for longitudinal seam straight duct.
4. Diverging-Flow Fittings: Fabricate with a reduced entrance to branch taps with no excess material projecting from the body onto branch tap entrance.
5. Elbows: Fabricate in die-formed, gored, pleated, or mitered construction. Fabricate the bend radius of die-formed, gored, and pleated elbows 1.5 times the elbow diameter. Unless elbow construction type is indicated, provide elbows meeting the following requirements:

a. Mitered Elbows: Fabricate mitered elbows with welded construction in gages specified below.

1) Mitered Elbows Radius and Number of Pieces: Unless otherwise indicated, construct elbow to comply with SMACNA "HVAC Duct Construction Standards," Table 3-1.
2) Round Mitered Elbows: Solid welded and with metal thickness listed below for pressure classes from minus 2 inches to plus 2 inches:

a) 3 to 26 inches: 24 gage.
b) 27 to 36 inches: 22 gage.
c) 37 to 50 inches: 20 gage.
d) 52 to 60 inches: 18 gage.
e) 62 to 84 inches: 16 gage.

3) Round Mitered Elbows: Solid welded and with metal thickness listed below for pressure classes from 2 inches to 10 inches:

a) 3 to 14 inches: 24 gage.
b) 15 to 26 inches: 22 gage.
c) 27 to 50 inches: 20 gage.
d) 52 to 60 inches: 18 gage.
e) 62 to 84 inches: 16 gage.

4) Flat Oval Mitered Elbows: Solid welded and with the same metal thickness as longitudinal seam flat oval duct.
5) 90-Degree, 2-Piece, Mitered Elbows: Use only for supply systems, or exhaust systems for material handling classes A and B, and only where space restrictions do not permit the use of 1.5 bend radius elbows. Fabricate with a single-thickness turning vanes.

b. Round Elbows - 8 Inches and Smaller: Die-formed elbows for 45- and 90-degree elbows and pleated elbows for 30, 45, 60, and 90 degrees only. Fabricate nonstandard bend angle configurations or 1/2-inch-diameter (e.g. 3-1/2- and 4-1/2-inch) elbows with gored construction.
c. Round Elbows - 9 Through 14 Inches: Gored or pleated elbows for 30, 45, 60, and 90 degrees, except where space restrictions require a mitered elbow. Fabricate nonstandard bend angle configurations or 1/2-inch-diameter (e.g. 9-1/2- and 10-1/2-inch) elbows with gored construction.
d. Round Elbows - Larger Than 14 Inches and All Flat Oval Elbows: Gored elbows, except where space restrictions require a mitered elbow.
e. Die-Formed Elbows for Sizes Through 8 Inches and All Pressures: 20 gage with 2-piece welded construction.
f. Round Gored Elbows Gages: Same as for nonelbow fittings specified above.
g. Flat Oval Elbows Gages: Same as longitudinal seam flat oval duct.
h. Pleated Elbows Sizes Through 14 Inches and Pressures Through 10 Inches: 26 gage.

1.3 Execution:

A. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.

B. Install ducts with the fewest possible joints.

C. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.

D. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.

E. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.

F. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

G. Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.

H. Install insulated ducts with 1-inch clearance outside of insulation.

I. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.

J. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

K. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.

L. Non-Fire-Rated Partition Penetrations: Where ducts pass interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-1/2 inches.

M. Seam And Joint Sealing: Seal duct seams and joints as follows:

1. Pressure Classifications Greater Than 3 Inches Water Gage: All transverse joints, longitudinal seams, and duct penetrations.
2. Pressure Classification 2 and 3 Inches Water Gage: All transverse joints and longitudinal seams.
3. Pressure Classification Less than 2 Inches Water Gage: Transverse joints only.
4. Seal externally insulated ducts prior to insulation installation.

N. Hanging And Supporting: Install and support ducts as follows unless indicated otherwise:

1. Rigid Round and Rectangular: As indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.
2. Horizontal Ducts: Within 2 feet of each elbow and within 4 feet of each branch intersection.
3. Vertical Ducts: At a maximum interval of 16 feet and at each floor.
4. Upper Attachments To Structures: Allow for a load not exceeding 1/4 of the failure (proof test) load, but are not limited to the specific methods indicated.
5. Install concrete insert prior to placing concrete.
6. Install powder actuated concrete fasteners after concrete is placed and completely cured.

O. Connections: Make duct connections as specified below unless indicated otherwise:

1. Branch Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-7 and 2-8.
2. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.
3. Terminal Units Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figure 2-19.

P. Vacuum ducts systems prior to final acceptance to remove dust and debris.

END OF SECTION 23 3113

SECTION 23 3116 - NONMETAL DUCTS

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Low and medium pressure phenolic foam pre-insulated duct.

1.2 RELATED SECTIONS

A. Section 15060 - Hangers and Supports.

B. Section 15850 - Air Outlets and Inlets.

1.3 REFERENCES

A. ASHRAE - Fundamentals Handbook; Chapter 32 - Duct Design, Latest Edition.

B. ASHRAE - HVAC Systems and Equipment; Chapter 16 - Duct Construction, Latest Edition.

C. SMACNA Leakage, Class 6.

D. UL 181 - Air Duct Standards.

1.4 DEFINITIONS

A. Pressure Classifications:

1. Low Pressure/Low Velocity: Less than or equal to 2 inch water gauge (WG) positive or negative static pressure and velocities less than 2,500 FPM.

B. Duct Sizes: Inside clear dimensions are indicated on drawings.

C. Ductwork:

1. Duct Pressure Classification: As required for the pressure available from the fan or a minimum of 2 inch WG, whichever is greater.
2. Ductwork to be sealed to SMACNA Class "A" requirements including the transverse joints, fitting connections, 45 degree takeoff connections, bellmouth connections and longitudinal seams.
3. Duct material not to exceed 25 Flame Spread and 50 Smoke Developed.

1.5 REGULATORY REQUIREMENTS

A. Construct ductwork to ANSI/NFPA 90A and 96 standards.

1.6 SUBMITTALS

A. Submit detailed ductwork coordination plans drawn to a scale of not less than 1/4 inch = 1'-0" for general building areas and 3/8 inch = 1'-0" for mechanical rooms and similar congested areas under provisions of Section 01330 - Submittal Procedures. Provide elevation views of equipment such as air handling units, fans, hoods, etc.

B. Shop Drawings: Submit detailed ductwork coordination plans drawn to a scale of not less than 1/4 inch = 1'-0" for general building areas, mechanical rooms and similar congested areas. Indicate duct routing, duct dimensions, elevation of ducts above finished floor, duct fittings, standard shop practices and particulars such as gauges, sizes welds and configuration prior to start of work.

1.7 DELIVERY, STORAGE AND HANDLING

A. Deliver products to site under provisions of Section 01663 Product Delivery, Storage and Handling Requirements.

B. Store and protect products under provisions of Section 01663 - Product Delivery, Storage and Handling Requirements.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS - FLEXIBLE DUCT

A. Omniaire

B. Atco

C. Thermaflex

2.2 ACCEPTABLE MANUFACTURERS - VOLUME DAMPERS

A. Nailor Industries

B. Ruskin

C. Greenheck

2.3 ACCEPTABLE MANUFACTURERS - FLEXIBLE DUCT CONNECT0R

A. Elgen

B. DuroDyne

C. Ventfabrics

2.4 MATERIALS

A. General: on-combustible flexible materials conforming to requirements of ANSI/NFPA 90A for Class 1 air duct materials and UL 181.

B. Fasteners: Rivets, bolts or sheet metal screws. Fasteners which are visible on the diffuser or grille faces shall be furnished with the terminal device at the factory and match the finish.

C. Sealant: On-hardening, water base, fire resistive, compatible with mating materials or liquid used with tape or heavy mastic with membrane.

D. Hanger Rod: Teel, galvanized; threaded both ends, threaded one end or continuously threaded.

2.5 LOW & MEDIUM PRESSURE/LOW & HIGH VELOCITY DUCT

A. Rigid, rectangular, pre-insulated, closed cell, CFC-free phenoloic foam board conforming to SMACNA Class 6 leakage; factory molded and faced on both sides with 25 micron aluminum foil reinforced with a 5 mm glass tissue mesh; and aluminum flanges. Duct to contain UL label and other markings required by UL 181 on each full sheet of duct board; UL ratings for closure materials. Temperature limits to be 250 Degree F inside duct and 150 Degree F ambient temperature surrounding duct.

B. Thermal Conductivity: 'K' value of 0.13 at 75 Degree F.

C. Moisture Absorption: Not to exceed 5 percent by weight at 120 Degree F and 95 percent relative humidity for 96 hours when tested in accordance with ASTM C-423.

D. Vapor Barrier Permeability: 0.02 perms maximum when tested in accordance with ASTM E96, Procedure A.

E. Noise Reduction Coefficient: 0.65 minimum when tested in accordance in accordance with ASTM C423, Mounting A.

F. Reinforcements:

1. Tie-Rod Reinforcements: 0.108 inch galvanized-steel wire of length to suit termination method.
2. Reinforcing Rod Washers: 2-1/2 inch square by 0.028 inch thick, galvanized-steel washer with turned edges and volcano-type center hole.
3. Sag-Control Supports: 1/2 inch galvanized steel conduit.

G. Joint Closure Sealing:

1. Minimum 2-1/2 inch wide pressure sensitive tape, glass-fiber-reinforced, aluminum-foil tape complying with UL 181A, Part P and imprinted with required information.
2. Heat Activated Tape: Minimum 2-1/2 inch wide, glass-fiber-reinforced, foil scrim tape complying with UL 181A, Part H and imprinted with required information.
3. Mastic and Glass Fabric: Minimum 3 inch wide glass fabric and duct manufacturer's recommended mastic that complies with UL 181.

H. Construct tee's, bends and elbows with radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular or miter elbows are used, provide single thickness air foil turning vanes. The use of double wall air foil turning vanes shall be approved if there is no increase in cost.

I. Increase duct sizes gradually, not exceeding 22.5 degree air divergence wherever possible. Ensure air divergence upstream of equipment does not exceed 30 degree. Ensure convergence downstream of equipment does not exceed 45 degree.

J. Construct all branch takeoffs from both the supply and return mains and sub-mains with 45 degree branch takeoff fittings equipped with volume control dampers. Should 45 degree branch takeoffs not be appropriate, two-piece bellmouth or conical takeoffs with volume control dampers will be acceptable.

K. Connect flexible ducts to phenolic foam ducts with adhesive, draw-band and foil faced duct tape.

L. Seal all transverse joints, longitudinal seams and duct wall penetrations.

M. Provide easements where low pressure ductwork conflicts with piping and structure. Where easements exceed 10 percent duct area, split into two ducts maintaining original duct area.

N. Use double nuts and lock washers on threaded rod supports.

O. Fabricate rectangular ducts and fittings from duct boards.

P. Fabricate mitered elbows with turning vanes.

Q. All branch takeoff connections on supply ducts shall contain volume control dampers in branch ducts.

R. Attach metal components to phenolic foam ducts with galvanized steel washers on opposite surfaces of duct walls.

2.6 FLEXIBLE AIR DUCT

A. UL 181, Class 1 commercial grade flexible duct rated for 10 inch WG having a minimum R-6 rating and constructed of a vinyl interior liner supported by helically wound spring steel wire with flexible high density glass fiber insulation and enclosed with a metalized spiral reinforced vapor barrier jacket; Model 1200 manufactured by Omniair, Model UPC #016 manufactured by Atco, Series MKE manufactured by Thermaflex or approved equal. Hard duct drops will not be approved unless waived by the Owner prior to design.

B. Provide flexible duct in one-piece, 2 feet minimum and not to exceed 8 linear feet. Spliced flexible duct is PROHIBITED.

2.7 TURNING VANE

A. Single thickness, galvanized steel type air foil turning vanes for sizes up to 24 inches in depth and cataloged by a recognized air distribution equipment manufacturer. Provide double thickness air foil turning vanes for sizes greater than 24 inches in depth or in all instances where there is no increase in cost over the single thickness air foil turning vanes. Provide at all 90 degree square elbows.

2.8 MANUAL VOLUME CONTROL DAMPER

A. 16 gauge galvanized steel channel frames, 5inch wide x 16 gauge galvanized steel blades with molded synthetic bearings, 1/2 inch stainless steel hex axles double thru-bolted at each end of blade, 2 inch high standoff brackets on quadrants for insulated duct. Dampers capable of moving freely through a full 90 degree arc. Model 1820 as manufactured by Nailor, Model MD-35 as manufactured by Ruskin or approved equal.

B. Opposed blade type dampers are to be provided when duct dimensions are greater than 12 inches in depth. Parallel blade type dampers may be provided when duct dimensions are no greater than 48 inches wide x 12 inches depth.

2.9 FLEXIBLE DUCT CONNECTOR

A. 22 ounce neoprene coated fiberglass fabric connectors with a minimum tear and tensile strength of 110 Lbs. and 250 Lbs, respectfully. Provide in 6 inch minimum to 10 inch

maximum lengths at all duct connections to rotating or vibrating equipment such as air handler units, unit ventilators, etc. Model "Silent Duct" manufactured by Elgen Manufacturing Corporation.

2.10 DUCT HANGER STRAPS

A. 1 inch gauge galvanized steel fastened with screws to rectangular ducts and with a bolt to round ducts.

B. Stainless steel suspension cable with ratchet as manufactured by Gripplle or approved equal.

2.11 HANGERS AND SUPPORTS

A. Concrete inserts, powder-actuated fasteners or structural steel fasteners appropriate for construction materials to which hangers are being attached to.

B. Use powder-actuated concrete fasteners for standard weight aggregate concretes or floor slabs more than 4 inches thick. Do not use powder-actuated concrete fasteners if the slab is less than 4 inches thick.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install ducts under provisions of the manufacturer's instructions and with a minimum number of joints.

B. Install ducts vertically, horizontally, parallel and perpendicular to the building lines.

C. Provide openings in ductwork where required to accommodate thermometers and controllers. Provide pilot tube openings where required for testing of systems, complete with metal can with spring device or screw to ensure against air leakage. Where openings are provided in insulated ductwork, install insulation material inside a metal ring.

D. Set plenum doors 6 inches to 12 inches above floor or side of duct. Arrange door swing so that fan static pressure holds door in a closed position.

E. Attach hangers to concrete floor slabs by the use of drilled concrete anchored fasteners after the concrete slab has cured. The use of powder actuated fasteners is PROHIBITED.

F. Attach hangers to joints and reinforcing channels that occur within required hanger spacing. Attach hangers to transmit load to sides and bottom channels and no more than 6 inches from sides of ducts.

G. Install ducts with a clearance of 1 inch and as close to the walls, overhead construction, columns and other structural and permanent enclosure elements of the building.

H. Support horizontal ducts with trapeze-type hangers.

I. Support equipment and duct components and accessories independent of ducts.

J. Locate ducts with sufficient space around the air handler unit to allow normal operating and maintenance activities.

K. Connect supply air diffusers and return air grilles to low pressure ducts with 8 feet maximum length of flexible air duct. Should the duct length from the duct takeoff to the supply air diffuser or return air grille exceed 8 feet in length, the difference in length shall be provided with the use of rigid duct of an equivalent cross sectional area.

L. Install flexible air duct without sharp bends. Minimum centerline radius to be not less than the duct diameter as recommended by SMACNA. Replace crushed or deformed flexible air ducts. Secure ducts with drawbands, foil faced silver tape and mastic at takeoffs and diffusers.

M. During construction, provide temporary closures on all open ductwork by sealing with a disposable polyethylene sheet to prevent construction dust from entering ductwork system.

N. Do not install ductwork inside buildings until the building is weather-tight. Replace weather damaged ductwork at no cost to the Owner without any time extension to the Contractor.

O. Provide all necessary structural steel hangers, sheet metal flanges and reinforcements required to install the electric duct heater and other equipment in the duct system.

P. Do not support ductwork from joist cross and lateral bracing or from galvanized steel decking. Should the deck be constructed of concrete, support from the concrete deck will be permitted.

3.2 ADJUSTING AND CLEANING

A. Protect AHU equipment which may be harmed by excessive dirt with temporary 4 inch depth, 60-65 percent ADS disposable filters during cleaning. Refer to Section 15860 - Air Cleaning Devices.

B. Provide adequate access into ductwork for cleaning purposes.

END OF SECTION 23 3116

SECTION 23 3423 - HVAC POWER VENTILATORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Ceiling mounted fans.
   2. Propeller fans.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on 800 feet above sea level.

B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

   1. Certified fan performance curves with system operating conditions indicated.
   2. Certified fan sound-power ratings.
   3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
   4. Material thickness and finishes, including color charts.
   5. Dampers, including housings, linkages, and operators.
   6. Fan speed controllers.

B. Operation and Maintenance Data: For power ventilators to include in emergency, operation, and maintenance manuals.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

D. UL Standard: Power ventilators shall comply with UL 705.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver fans as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.

B. Disassemble and reassemble units, as required for moving to final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

A. Coordinate size and location of structural-steel support members.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

C. Coordinate installation of roof curbs, equipment supports, and roof penetrations. These items are specified in Division 07 Section "Roof Accessories."

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Greenheck
2. Twin City
3. Loren Cook
4. Penn Barry
5. Panasonic

2.2 CEILING-MOUNTED VENTILATORS

A. Housing: Steel, lined with acoustical insulation.

B. Fan Wheel: Centrifugal wheels directly mounted on motor shaft. Fan shrouds, motor, and fan wheel shall be removable for service.

C. Motors:

1. Comply with NEMA designation, temperature rating, service factor, enclosure type, and efficiency requirements for motors specified in Division 23 Section "Common Motor Requirements for HVAC Equipment."

a. Motor Sizes: Minimum size as indicated in the schedule on the Drawings. If not indicated, large enough so driven load will not require motor to operate in service factor range above 1.0.

b. Controllers: Refer to the schedule on the Drawings and to other Division 23 Sections for requirements for enclosed controllers and variable frequency controllers.

c. Electrical Devices and Wiring: Comply with requirements for electrical devices and connections specified in Division 26.

2. Enclosure Type: Open drip proof (ODP) or totally enclosed, fan cooled (TEFC).

D. Grille: Plastic louvered grille with flange on intake and thumbscrew attachment to fan housing.

E. Electrical Requirements: Junction box for electrical connection on housing and receptacle for motor plug-in.

F. Isolation: Blower and motor shall be mounted on rubber isolators that isolate them from the fan housing.

G. Accessories:

1. Speed Controller: Solid-state control to reduce speed from 100 to less than 50 percent.
2. Manufacturer's standard wall cap, and transition fittings.

H. Controls: Refer to Division 23 Sections “Automatic Temperature Control for HVAC” and “Sequence of Operation for HVAC Controls” for requirements.

I. Capacities and Characteristics: Refer to the schedule on the drawings.

2.4 EXHAUST FAN OPERATION

A. Cabinet Exhaust Fans shall operate on an occupancy sensor:

PART 3 – EXECUTION

3.1 INSTALLATION

A. Support units using elastomeric mounts having a static deflection of 1 inch. Vibration- control devices are specified in Division 23 Section "Vibration Controls for HVAC Piping and Equipment."

B. Support suspended units from structure using threaded steel rods and elastomeric hangers having a static deflection of 1 inch. Vibration-control devices are specified in Division 23 Section "Vibration and Seismic Controls for HVAC Piping and Equipment."

C. Install units with clearances for service and maintenance.

D. Label units according to requirements specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.2 CONNECTIONS

A. Duct installation and connection requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of ducts and duct accessories. Make final duct connections with flexible connectors. Flexible connectors are specified in Division 23 Section "Air Duct Accessories."

B. Install ducts adjacent to power ventilators to allow service and maintenance.

C. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

D. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.3 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Verify that shipping, blocking, and bracing are removed.
2. Verify that unit is secure on mountings and supporting devices and that connections to ducts and electrical components are complete. Verify that proper thermal-overload protection is installed in motors, starters, and disconnect switches.
3. Verify that cleaning and adjusting are complete.
4. Disconnect fan drive from motor, verify proper motor rotation direction, and verify fan wheel free rotation and smooth bearing operation. Reconnect fan drive system, align and adjust belts, and install belt guards.
5. Adjust belt tension.
6. Adjust damper linkages for proper damper operation.
7. Verify lubrication for bearings and other moving parts.
8. Verify that manual and automatic volume control and fire and smoke dampers in connected ductwork systems are in fully open position.
9. Disable automatic temperature-control operators, energize motor and adjust fan to indicated rpm, and measure and record motor voltage and amperage.
10. Shut unit down and reconnect automatic temperature-control operators.
11. Remove and replace malfunctioning units and retest as specified above.

B. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 ADJUSTING

A. Adjust damper linkages for proper damper operation.

B. Adjust belt tension.

C. Refer to Division 23 Section "Testing, Adjusting, and Balancing for HVAC" for testing, adjusting, and balancing procedures.

D. Replace fan and motor pulleys as required to achieve design airflow.

E. Lubricate bearings.

END OF SECTION 23 3416

SECTION 23 3713 - DIFFUSERS, REGISTERS, AND LOUVERS

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Ceiling diffusers.
2. Rectangular and square ceiling diffusers.
3. Modular core supply grilles.
4. Adjustable side wall registers and grilles.

B. Related Sections:

1. Division 08 Section "Louvers and Vents" for fixed and adjustable louvers and wall vents, whether or not they are connected to ducts.
2. Division 23 Section "Air Duct Accessories" for fire and smoke dampers and volume-control dampers not integral to diffusers, registers, and grilles.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated, include the following:

1. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static-pressure drop, and noise ratings.
2. 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: Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Hart and Cooley
2. Titus
3. Nailor
4. Price
5. Kreuger
6. Metalaire

2.2 CEILING DIFFUSERS

A. Rectangular and Square Ceiling Diffusers:

1. Devices shall be specifically designed for variable-air-volume flows.
2. Material: Steel.
3. Finish: Baked enamel, white.

4. Face Size: 24 by 24 inches (600 by 600 mm).
5. Face Style: Plaque Face.
6. Mounting: Surface or T-bar to match ceiling type.
7. Pattern: Adjustable.
8. Dampers: None.
9. Accessories:

2.3 REGISTERS AND GRILLES

A. Adjustable Side Wall Register:

1. Material: Steel.
2. Finish: Baked enamel, white.
3. Face Blade Arrangement: Vertical spaced 3/4 inch (19 mm) apart.
4. Core Construction: Removable.
5. Rear-Blade Arrangement: Horizontal spaced 3/4 inch (19 mm) apart.
6. Frame: 1-1/4 inches (32 mm) wide.
7. Mounting: Countersunk screw.
8. Damper Type: Adjustable opposed blade.
9. Accessories:
    a. Front-blade gang operator.
    b. Filter.

2.4 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. Ceiling-Mounted Outlets and Inlets: Drawings indicate general arrangement of ducts, fittings, and accessories. Air outlet and inlet locations have been indicated to achieve design requirements for air volume, noise criteria, airflow pattern, throw, and pressure drop. Make final locations where indicated, as much as practical. For units installed in lay-in ceiling panels, locate units in the center of panel. Where architectural features or other items conflict with installation, notify Architect for a determination of final location.

C. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers, air extractors, and fire dampers.

3.3 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION 23 3713

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SECTION 23 5400 - FURNACES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:
   1. Gas-fired, non-condensing, and Gas-fired, condensing furnaces and accessories complete with controls.
   2. Air filters.
   3. Thermostat.

1.3 PERFORMANCE REQUIREMENTS

A. Project Altitude: Base fan-performance ratings on 800 feet above sea level.

B. Operating Limits: Classify according to AMCA 99.

1.4 SUBMITTALS

A. Product Data: Include rated capacities, furnished specialties, and accessories for each type of product indicated and include the following:

   1. Certified fan performance curves with system operating conditions indicated.
   2. Certified fan sound-power ratings.
   3. Motor ratings and electrical characteristics, plus motor and electrical accessories.
   4. Material thickness and finishes, including color charts.
   5. Electric heater capacity
   6. Electric power requirements and characteristics.

1.5 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. AMCA Compliance: Products shall comply with performance requirements and shall be licensed to use the AMCA-Certified Ratings Seal.

C. NEMA Compliance: Motors and electrical accessories shall comply with NEMA standards.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver furrances as factory-assembled unit, to the extent allowable by shipping limitations, with protective crating and covering.

B. Disassemble and reassemble units, as required for moving to final location, according to manufacturer's written instructions.

C. Lift and support units with manufacturer's designated lifting or supporting points.

1.7 COORDINATION

A. Coordinate size and location of structural-steel support members.

B. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

1.8 WARRANTY

A. Manufacturer's Warranty: Provide the manufacturer's standard written warranty against defects in materials and workmanship. Do not void manufacturer's warranty by installation practices unacceptable to the manufacturer.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace the following components of furnaces that fails in materials or workmanship within specified warranty period:

1. Warranty Period, Commencing on Final Completion:

a. Furnace Parts: Five (5) years.

C. Contractor's Warranty: The Contractor is responsible for the complete installation of the new furnace in a manner that will preserve the manufacturer's warranty. The Contractor will submit a written and signed warranty, in which Contractor agrees to repair or replace the furnace and associated installation materials that are defective in materials or workmanship related to installation of the furnace for a period of one (1) year from the Date of Final Completion.

1. Any corrective work to maintain the performance in this warranty will be carried out by the Contractor at no cost to the Owner.

2. Warranty period: One (1) year from Final Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Carrier Corporation; Div. of United Technologies Corp.
2. York, a Johnson Controls Company
3. Trane; a business of American Standard Companies.

2.2 GAS FURNACES

A. Furnaces, General: Factory assembled, piped, wired, and tested.

1. Configuration: Upflow.
2. Cabinet: Steel with foil-faced, glass-fiber, interior insulation. Lift-out panels expose burners and all other items requiring access for maintenance.
3. Finish of External Casings and Cabinets: Baked enamel over corrosion-resistant-treated surface.
4. Fan: Centrifugal, factory balanced, resilient mounted.

5. Fan Motors: Multitapped, multispeed, with internal thermal protection and permanent lubrication.

B. Gas-Fired Furnaces, "Medium" Efficiency: Comply with AGA Z21.47, "Gas-Fired Central Furnaces"; and NFPA 54, "National Fuel Gas Code."

1. AGA Approval: Bear label of American Gas Association.
2. Type of Gas: Natural.
3. Efficiency: 90 percent AFUE, minimum.
4. Heat Exchanger: Aluminized and stainless steel.
5. Burner: Inshot type.

a. Gas Valve: 100 percent safety gas shutoff; 24-V combining pressure regulation, safety pilot, manual set (ON-OFF), pilot filtration, and automatic electric valve.
b. Ignition: Electronic pilot ignition, with electric spark igniter.

7. Gas Burner Safety Controls: As follows:

a. Thermocouple Sensor: Prevents gas valve from opening until pilot flame is proven; stops gas flow on ignition failure.
b. Vent Safety Pressure Switch: Prevents operation in case of blockage of combustion air, flue outlet, or condensate drain.
c. Limit Control: Fixed stop at maximum permissible setting; de-energizes burner on excessive bonnet temperature; automatic resets.

8. Venting: Power venting, using integral centrifugal fan.
9. Automatic Controls: Solid-state board delays fan start and fan shutdown.

C. Controls: Include components required for satisfactory operation of furnaces and auxiliary equipment in all seasons.

1. Control Transformer: 24 VAC output, factory installed, and wired in furnace.
2. Thermostat: 24 VAC, solid-state, programmable, microprocessor-based wall mounting unit with automatic switching from heating to cooling, preferential rate control, multiple temperature presets selectable by day and time, and battery back-up protection of program settings against power failure.
3. Relays: As required to achieve specified operation.
4. Wire and Cable: Specified in Division 26 Section "Low Voltage Electrical Power Conductors and Cables."

D. Filters: 1-inch- (25-mm-) thick, disposable, fiberglass type in sheet metal rack.

E. Controls: Include components required for satisfactory operation of furnaces and auxiliary equipment in all seasons.

1. Control Transformer: 24 VAC output, factory installed, and wired in furnace.
2. Thermostat 24 VAC, solid-state, programmable, microprocessor-based wall mounting unit with automatic switching from heating to cooling, preferential rate control, multiple temperature presets selectable by day and time, and battery back-up protection of program settings against power failure.
3. Relays: As required to achieve specified operation.
4. Wire and Cable: Specified in Division 26 Section "Low Voltage Electrical Power Conductors and Cables."

F. Filters: 1-inch- (25-mm-) thick, disposable, fiberglass type in sheet metal rack.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Install furnaces and accessories according to manufacturer's written instructions.

B. Install and connect gas-fired furnaces and associated fuel and vent features and systems according to NFPA 54, applicable local codes and regulations, and manufacturer's published installation instructions.

1. Vents, Outside-Air Pipe Connections, and Drains: Where polyvinyl chloride (PVC) piping is used, install according to Division 23 Section "Common Work Results for HVAC." Install vent terminal designed to protect against birds, insects, and dirt.

2. Connect condensate drain pans using copper tubing, ASTM B 88, Type M (ASTM B 88M, Type C) with streamline drainage fittings and soldered joints or PVC drainage piping. Extend to nearest equipment drain or floor drain. Construct vented, deep trap at connection to drain pan and install cleanouts at changes in direction. Terminate to suit local code requirements, except where stricter methods are indicated.

C. Base-Mounted Units: Secure units to substrate. Provide optional bottom closure base where installation conditions require.

D. Controls: Install thermostats and humidistats at mounting height of 60 inches (1500 mm) above floor.

E. Control Wiring: Install control wiring as specified in Division 26 Section "Low Voltage Electrical Power Conductors and Cables."

F. Connect ducts according to Division 23 Section "Metal Ducts."

G. Identify furnaces and connections according to Division 23 Section "Common Work Results for HVAC."

H. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. Specific connection requirements are as follows:

1. Install piping adjacent to machine to allow service and maintenance.

I. Electrical: Conform to applicable requirements of Division 26 Sections.

1. Install electrical devices provided with furnace but not specified to be factory mounted.

J. Connect motors and components to wiring systems and to ground as indicated and instructed by manufacturer. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.2

END OF SECTION 23 5400

SECTION 26 0500 - COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 HEIGHT OF BOXES

A. Outlet mounting heights as indicated on the plans are approximate for bidding purposes only. The exact mounting height (and locations) of outlets shall be determined in the field with relation to architectural detail and equipment being served. It shall be the responsibility of the electrical contractor to coordinate outlet location with equipment, with furniture plans and with architectural elevation plans. Where mounting heights are not detailed or dimensioned, contact the owner's representative for direction.

B. Prior to rough-in, coordinate final mounting heights of all system outlet boxes in field with Owner's representative. Height of boxes dimensioned from ceiling as given above apply to rooms having ceiling 9' or less. In rooms having higher ceilings, these outlets shall be located as directed in the field. Height of boxes from finished floor to center of boxes shall be as follows, unless directed otherwise in field or otherwise noted on electrical plans or architectural plans.

1. Switches
   a. Counter - 3'-8" (verify and match counter receptacle heights)
   b. Elsewhere - 4'-0"

2. Receptacles
   a. Counters - 3'-8" (verify)
   b. Elsewhere - 1'-6" to bottom of box

3. Telephone Outlets/Data Outlets
   a. Desk Phone - 1'-6"
   b. Wall Phone - 4'-0"

4. Starters - 4'-0"
5. Disconnects - 4'-0"
6. Circuit Breaker Panelboards - 6'-0" to top of panel
7. Wall Mounted Light Fixtures - As noted on plans or as directed by Architect
8. Clock Outlets - 1'-0" below ceiling to top of clock (verify)
9. Television Outlets (MATV/CATV) - 1'-6"
10. Desktop/Tabletop/Portable Sets - 1'-6"
11. Wall/Ceiling Bracket Sets - 1'0"
12. Occupancy Sensors
    a. Wallbox Switches - 4'0"
    b. Others - See Mfg. Literature
13. Other Outlets/Fixtures/Equipment - As Directed by Architect

1.2 ACCESS DOORS

A. Access doors shall not be used unless special prior written permission is granted from the Owner's representative. All pull boxes, junction boxes, etc. shall be installed in areas which are readily accessible after completion of construction. Pull boxes and junction boxes shall not be installed above gypsum board or similar ceiling systems. Where there is no other recourse but to provide and access door/panel and where approval of Owner's representative has been obtained, provide all required access door/panels as required for a complete code-compliant electrical installation as defined below.

B. For installation in masonry, concrete, ceramic tile, or wood paneling provide 1 inch-wide-exposed perimeter flange and adjustable metal masonry anchors. For gypsum wallboard or plaster provide perforated flanges with wallboard bead. For full-bed plaster applications provide galvanized expanded metal lath and exposed casing bead, welded to perimeter of frame.

C. Set frames accurately in position and securely attached to supports, with face panels plum and level in relation to adjacent finish surfaces. Adjust hardware and panels after installation for proper operation. Locking devices shall be flush, screwdriver-operated cam locks.

D. Provide factory-fabricated and assembled units, complete with attachment devices and fasteners ready for installation. Joints and seams shall be continuously welded steel, with welds ground smooth and flush with adjacent surfaces. Frames shall be 16-guage, with a 1-inch-wide exposed perimeter flange for units installed in unit masonry, pre-cast, or cast-in-place concrete, ceramic tile, or wood paneling. Standard Flush Panel Doors shall be 14-guage steel, with concealed spring hinges or concealed continuous piano hinge set to open 175 degrees; factory applied prime paint. Fire-Rated Units shall be insulated flush panel doors, with continuous piano hinge and self-closing mechanism.

E. Subject to compliance with requirements, provide products by one of the following:

1. Bar-Co., Inc.
2. J.L. Industries
3. Karp Associates, Inc.
4. Milcor Div. Inryco, Inc.
5. Nystrom, Inc.

1.3 ELECTRICAL INSTALLATIONS

A. All electrical work installed in finished areas shall be concealed. All electrical work installed in unfinished areas may be exposed at the discretion of the Owner's representative. Where exposed conduit and boxes are installed in areas which are already finished, such work shall be painted by the electrical contractor to match adjacent surfaces as directed in field.

B. Arrange for chases, slots, and openings in other building components during the progress of construction, to allow for electrical installations. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the work.

C. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible.

D. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and architectural/structural components.

E. Install electrical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. Connect equipment for ease of disconnecting, with minimum of interference with other installations.

F. Install systems, materials and equipment giving right-of-way priority to systems required to be installed a specified slope.

G. Project the structure, furnishings, and adjacent materials not indicated or scheduled to be removed.

H. Verify all dimensions by field measurements. Take measurements and be responsible for exact size and locations of all openings required for the installation of work. Figured

dimensions are reasonably accurate and should govern in setting out work. Where detailed method of installation is not indicated or where variations exist between described work and approved practice, direction of the owner's representative on job shall be followed. Where applicable, remove and/or relocated any existing electrical work conflicting with new construction.

I. Branch circuits shall be installed as shown on the plans. The symbols used to indicate the purpose of which the various outlets are intended are identified in the legend. Where outlets are indicated by letters on plans, they shall be controlled by corresponding switches.

J. No wire size smaller than No. 12 shall be used for any branch circuit unless otherwise noted on plans for control circuits. Larger sizes shall be used where required and/or indicated on the plans. Minimum conduit size shall be 3/4".

K. Device or fixture outlets shall not be installed directly back to back, where located on opposite sides of common walls. Outlets shall be offset by at least two feet.

L. All wires shall be run continuous from outlet to outlet and all joints shall be properly spliced. Insulation value of joints shall be 100% in excess of that of the wire. Mechanical wire splicers may be used. Friction and rubber tape shall conform to Federal Specifications HH-T-11 and HH-T-111. Plastic electrical tape shall be Scotch #33 or approved equal. The conductors terminating at each wired outlet shall be left not less than 6" long at their outlet fittings to facilitate installment of devices of fixtures.

M. If during construction if becomes apparent that certain minor changes in layout will effect a neater job or better arrangement, such alterations shall be made a part of the contract. Engineer's review shall be obtained before making such changes.

N. Workmanship throughout shall conform to the standards of best practice. Marks, dents or finish scratches will not be permitted on any exposed materials, fixtures or fittings. Inside of panels and equipments boxes shall be left clean.

1.4 COORDINATION

A. Coordination shall commence immediately upon award of contract. Failure of this contractor in coordinating (including providing related information to other trades for review) in a timely manner, shall not result in any subsequent additional reimbursement, special allowances or additional construction time being made for any facet of the project. Any work fabricated or installed before properly coordinating with all other trades will be done at this contractor's risk.

B. Plans are diagrammatic indicating design intent and indicating required size, points of termination and, in some cases, suggested routes, all necessary offsets, etc. All ductwork, piping, conduit, raceways, cable assemblies, etc. shall be run as straight as possible and symmetrical (perpendicular to or parallel with) architectural items. Work installed diagonal to building members shall not be permitted. The contract document drawings are an outline to indicate the approximate location and arrangement of ductwork, piping, equipment, outlets, raceways, cables, etc.

C. The electrical contractor shall work in harmony with all building contractors and sub-contractors, so as not to cause any delays in pouring concrete, building masonry wall, etc. The location of risers and branch conduits are approximate, but owing to the lack of space in some instances, all trades must work in harmony to insure space and satisfactory arrangement for all work to be installed under this contract. The electrical contractor shall consult the Architectural, Plumbing, HVAC and Structural plans in all instances before installing electrical work so that electrical work will not interfere with those branches.

D. This contractor shall participate in coordination efforts and in preparation of coordination drawings prior to fabrication or installation of any equipment, materials, etc. Coordinate actual clearances of all installed equipment. Exact location of electrical outlets, lighting fixtures, conduits, raceways, equipment, cable assemblies, applicable devices, etc. and of mechanical equipment, piping, ducts, fixtures, diffusers, grills, louvers, dampers, etc., shall be coordinated well in advance by all affected contractors so there will be no interferences at installation between the various trades. Ensure that work of all trades, as well as working clearances, in electrical rooms or spaces complies with NEC Article 110.

E. Conflicts in equipment and materials shall be corrected prior to installation. Should there be a conflict with drawings of other trades, this contractor shall work with the trades to correct the conflict while coordinating representative for a final decision as to method of material. Any work installed or equipment placed in position by this contractor creating a conflict shall be readjusted to the satisfaction of the owner's representative at the expense on this contractor.

1.5 IDENTIFICATION

A. General

1. Submit manufacturer's data on electrical identification materials and products. Submit detailed nameplate schedule indicating proposed nomenclature, colors, text heights, fastening methods, etc. If requested by Owner's representative, submit samples of each color, lettering style and other graphic representations required for each identification material or system.
2. Except as otherwise indicated, provide manufacturer's standard products of categories and types required for each application. Where more than single type is specified for an application, selection is Installer's option, but provide single selection for each application. Where identification is to be applied to surfaces which require finish, install identification after completion of painting. Comply with governing regulations and requests of governing authorities for identification of electrical work.

B. Cable and Conductor Identification

1. Provide manufacturer's standard vinyl-cloth self-adhesive conductor markers of wrap-around type, either pre-numbered plastic coated type, or write-on type with clear plastic self-adhesive cover flap; numbered to show circuit identification. Provide on all conductors of all systems. All conductors of all systems shall have color coded insulation. All cables of all systems shall have color coded jackets. Match color schemes with marking systems used in existing systems (where applicable), shop drawings, contract documents, and similar previously established identification of project's electrical work. Apply cable/conductor identification of each cable in each box/enclosure/cabinet for cables which are not available with color coded insulation or jackets.
2. The following insulation color code shall be used for power systems and voltage identification. This shall apply to both feeder and branch circuit wiring. Interchange of colors shall no be permitted. The use of scotch color coding tapes for phase identification is not permitted. Branch circuit and feeder conductor insulation shall be color coded throughout entire length.

    a. 208/120V system - Black, Red, Blue and White
    b. Equipment Grounding - Green

3. Engraved Plastic-Laminate Signs

a. Install signs at locations for best convenience of viewing without interference with operation and maintenance of equipment. Secure to substrate with stainless steel fasteners, except use permanent adhesive where fasteners should not or cannot penetrate substrate.
b. All equipment and systems identification nomenclature shown on drawings or listed herein is shown for general design and installation reference only. The actual nameplate, etc. nomenclature for the project shall be verified by electrical contractor in field prior to fabrication and where applicable, shall be an extension of existing nomenclature used on the site as determined in field by electrical contractor. Record documents shall be prepared accordingly. Unless determined otherwise in field, provide text matching terminology and numbering of the contract documents and shop drawings.
c. Unless directed otherwise, provide black face and white core plies (letter color) for normal power applications and red face and white core piles (letter color) for emergency power applications, punched for mechanical fastening except where adhesive mounting is mandatory because of substrate. For healthcare facilities, non-essential equipment shall have black face and white core plies, essential shall have orange face and white core, and critical shall have red face and white core. Provide 1/2" minimum text height for all equipment identification and 1/4" minimum text height for all nameplates with narrative descriptions/instructions. Thickness shall be 1/16", for units up to 20 sq. in. or 8" length; 1/8" for larger units. As a minimum provide signs for each unit of the following categories of electrical work where such work exists on the project.

    1) Electrical access panel doors.
    2) Starters, disconnects, contactors and control stations.
    3) Panelboards, electrical cabinets and enclosures.
    4) Control panels for all systems.
    5) Electrical switchboards and switchgear (include company name of engineer and installing contractor at all service entrance switchboards).
    6) Switch wall plates (via engraving) for all switches that control remote lights of loads.
    7) Other similar equipment designated by owner's representative or engineer in field.

1.6 CUTTING, PATCHING AND SEALING

A. General

1. The electrical contractor shall provide all cutting as required for the admission of electrical work unless directed otherwise in field, all related patching and painting (to match surrounding methods, materials and colors) shall be provided by the electrical contractor. Any damage done by this contractor's expense. Perform cutting, fitting, and patching for electrical equipment and materials as required to:

    a. Uncover work to provide for installation of ill-timed work.
    b. Remove and replace defective work.
    c. Remove and replace work not conforming to requirements of the Contract Documents.
    d. Remove samples of installed Work as specified for testing.
    e. Install equipment and materials in existing structures.

2. Upon Written instructions from the owner's representative, uncover and restore work to provide for observation of concealed work by owner's representative or by inspection authority having jurisdiction.

3. During cutting and patching operations, protect adjacent installation (structure, finishes, furnishings, etc.). Where applicable, provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to system components and components of other trades.
4. Patch surfaces and building components using new materials matching existing materials and using experienced Installers. Refer to Division 1 for definition of experiences "Installer" or determine qualifications as directed in field by owner's representative.
5. Patching through fire rated walls and enclosures shall not diminish the rating of that wall or enclosure. All materials used for patching shall be installed to meet or exceed the smoke and fire rating of the respective surface being patched.
6. Neatly cut and drill all openings in walls and floors required for the installation. Secure approval of Owner's Representative before cutting and drilling in existing facilities. Neatly patch all openings cut.
7. Cutting and patching shall be held to a minimum by arranging with other contractors for all sleeves and openings before construction is started.

END OF SECTION 26 0500

SECTION 260508 - ELECTRICAL SITE REQUIREMENTS

PART 1 - GENERAL

1.1 SITE INFORMATION

A. Subsurface conditions may have been investigated during the design of the project. If so, review reports of these investigations. Follow recommendations of these reports.

1.2 PROTECTION OF OPEN EXCAVATIONS

A. Protect excavated openings with substantial railings, fencing, signage, shoring, and steel roadway plates in strict compliance with OSHA/NIOSH, with local Department of Transportation (DOT) standards, with authorities having jurisdiction, and as directed by owner's representative in field.

B. Provide traffic detours per DOT standards during active construction work shift time periods. Provide related barricades, signage, portable flashing lights, etc. (per DOT standards) at specific locations as determined in field.

C. Provide steel roadway plates, properly installed and anchored per DOT standards, over roadway cuts during inactive periods (i.e. between construction work shifts, while concrete is curing, and while flowable backfill is curing).

D. Finish work affecting the roadways, and restore/pave roadway cuts, as quickly as possible after starting those segments of work. Carefully coordinate scheduling for roadway related work to allow adequate time for inspections and curing, while keeping overall related time to a minimum.

1.3 PROJECT CONDITIONS

A. Existing Utilities

1. Locate existing underground utilities in excavation areas, which are to remain. Support and protect these services during excavation operations.
2. Uncharted or Incorrectly Charted Utilities: Contact utility owner immediately for instructions.
3. Provide temporary utility services to affected areas. Give owner’s representative minimum 48-hour notice prior to utility interruption.

B. Explosives

1. Do not use explosives.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Backfill and Fill Materials

1. Use excavated material for backfill. Prior to backfilling, remove rock and gravel larger than 2 inches in any dimension, debris, waste, frozen materials, vegetable matter, and other deleterious matter.

B. Nonshrink, Nonmetallic Grout

1. Provide premixed, factory-packaged, non-staining, non-corrosive, nongaseous grout, recommended for interior and exterior applications.

C. Flowable Backfill Material

1. Refer to "CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE BACKFILL)" subsection under Part 3 - Execution below.

D. Subbase

1. Subbase refers to the compacted layer used in pavement systems between the subgrade and the pavement base course material. Provide subbase consisting of graded mixture of crushed gravel, crushed stone, crushed slag, or sand.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by excavation operations.

B. Comply with codes in jurisdiction. Provide sloped sides, and shore and brace as required when trenching to achieve stability. Provide excavation and backfilling required for electrical work and consult with utilities prior to beginning excavation. Remove materials of every nature and description encountered in obtaining required lines and grades. Remove excess excavated earth materials from the site.

C. Properly restore streets, sidewalks, concrete and blacktop surfaces that were broken for installing piping.

D. Where subsidence occurs at electrical installation excavations during a period of 12 months after Substantial Completion, remove surface treatment (i.e., pavement, lawn, or other finish), add backfill material, compact to specified conditions, and replace surface treatment. Restore appearance, quality, and condition of surface or finish to match adjacent areas.

3.2 EXCAVATION

A. Shoring and Bracing

1. Establish requirements for trench shoring and bracing to comply with local codes and authorities. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Slope sides of excavations to comply with local codes and ordinances. Shore and brace as required for stability of excavation. Remove shoring and bracing when no longer required.
2. Install sediment and erosion control measures in accordance with local codes and ordinances.

B. Dewatering

1. Prevent surface water, subsurface water, and ground water from flowing into excavations and from flooding project site and surrounding area.
2. Do not allow water to accumulate in excavations. Remove water to prevent softening of bearing materials. Provide and maintain dewatering system components necessary to
convey water away from excavations.
3. Establish and maintain temporary drainage ditches and other diversions outside excavation limits to convey surface water to collecting/run-off areas. Do not use trench excavations as temporary drainage ditches.

C. Material Storage

1. Stockpile satisfactory excavated materials where directed, until required for backfill or fill. Place, grade, and shape stockpiles for proper drainage.
2. Locate and retain soil materials away from edge of excavations. Do not store within drip-line of trees.
3. Remove from site, and legally dispose of, excess excavated materials and materials not acceptable for use as backfill or fill.

D. Trenching

1. Excavate trenches to the uniform width, sufficiently wide to provide ample working room.
2. Excavate trenches to depth indicated or otherwise necessary to full project requirements.
3. All trench widths indicated on drawings are minimum required widths.

E. Cold Weather Protection

1. Protect excavation bottoms against freezing when atmospheric temperature is less than 35 degrees Fahrenheit.

F. Backfilling and Filling

1. Place soil materials in layers to required elevations for each area classification listed below, using materials specified in Part 2 of this Section.
2. Backfill excavations as promptly as work permits, but not until completion of the following:

    a. Inspection, testing, and approval.
    b. Recording locations of underground utilities.
    c. Removing concrete formwork.

d. Curing of concrete.
e. Removing shoring and bracing, and backfilling of voids.
f. Removing trash and debris.

G. Placement and Compaction

1. Place backfill and fill materials in layers of not more than 8 inches in loose depth for material compacted by heavy equipment, and not more than 4 inches in loose depth for material compacted by hand-operated tampers.
2. Before compaction, moisten or aerate each layer as necessary to provide optimum moisture content. Compact each layer to required percentage of maximum dry density or
relative dry density for each area classification specified below. Do not place backfill or fill material on surfaces that are muddy, that are frozen, that contain frost, or that contain ice.
3. Place backfill and fill materials evenly adjacent to structures, piping, and equipment to required elevations. Prevent displacement of raceways and equipment by carrying material uniformly around them to approximately same elevation in each lift.
4. Compact each layer of backfill or fill material to 95 percent standard compaction.

H. Moisture Control

1. Where subgrade or layer of soil material must be moisture conditioned before compaction, uniformly apply water. Apply water in minimum quantity necessary to achieve required moisture content and to prevent water appearing on surface during, or subsequent to, compaction operations.

3.3 CONTROLLED LOW STRENGTH MATERIAL (FLOWABLE BACKFILL)

A. Description

1. Controlled-Low-Strength-Material (CLSM) is a material that has a specified compressive strength of 1200 pounds per square inch (PSI) at 28 days. This material is not concrete and is in a flowable state at the time of placement.

B. Materials

1. Provide CLSM mixture consisting of water, Portland Cement (Type I or II conforming to ASTM C-150, Type "F" fly ash, and fine aggregate.
2. If fly ash is not used, provide CLSM using high dosages of an air entraining admixture to help flowability and lower strength for removability.
3. Non-standard materials may be used only after receiving special permission from owner’s representative.
4. Provide water used in mixing and curing that is as clean and free of oil, salt, acid, alkali, sugar, vegetable, and other substances injurious to the finished product as possible. Test
water in accordance with the requirements to AASHTO T 26. Water known to be of potable quality may be used without testing.
5. Use fine aggregates conforming to ASTM C 33 in CLSM.

C. Mix Design

1. Provide proportion of materials used in CLSM as follows:

Cement:	50-100 pounds (lbs) per cubic yard
(cy) Type "F", Fly Ash:	250-300 lbs/cy
Sand:	2700-2800 lbs/cy
Water:	400-500 lbs/cy

2. Other proportions may be used only after receiving special permission from owner's representative.
3. Conform to the following flowability test:

   a. Fill a 3-inch diameter by 6-inch long open ended cylinder with the mixture, then strike off to level. Remove the cylinder by pulling straight up and ensure the diameter of the CLSM, after spreading, is a minimum of 8-inches.

D. Mixing and Transportation

1. Transport CLSM by mixer truck. Provide continuous agitation from mixing to placement.

E. Placement

1. Place CLSM directly from the truck chute or pump it. No additional compaction is required.

3.4 PREPARATION FOR TOPSOIL AND SEEDING

A. Separately stockpile excavated topsoil adjacent to the trench and utilize it in the final stage of backfilling operation.

B. Grade exposed earth and other erodible areas to a reasonably uniform, and satisfactory, cross section and slope, as soon as practicable.

END OF SECTION 260508

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SECTION 26 0519 - LOW-VOLTAGE POWER CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

B. Install all wire in raceway unless specifically permitted otherwise hereafter in this section under other Division 26 sections or on electrical drawings.

1.2 QUALITY ASSURANCE

A. Listing and Labeling: Provide wires and cables specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in NFPA 70, Article 100.

1.3 DELIVERY, STORAGE, AND HANDLING

A. Deliver wires and cables according to NEMA WC 26.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

B. Wires and Cables:

1. Southwire Company
2. American Insulated Wire Corp.
3. Carol Cable Co., Inc.
4. Senator Wire & Cable Company.

C. Connectors for Wires and Cables:

1. AMP Incorporated.
2. General Signal;
4. Square D Co.;
5. 3M Company; Electrical Products Division.

2.2 GENERAL

A. Provide wire and cable suitable for the temperature, conditions and location where installed.

2.3 CONDUCTORS

A. Conductor material shall be copper for all wires and cables. Conductor sizes indicated are based on copper. Minimum conductor size shall be #12 AWG. Provide stranded conductors for all sizes unless indicated otherwise.

B. Distances from panel to first outlet of a 15 or 20 amp branch circuit shall require the following minimum wire size to the first outlet. All branch circuits more than 100 feet in length shall be minimum No. 10 to the last outlet. Control circuits shall be No. 14 except for runs exceeding 300 feet where they shall be No. 12.

(1) Distance	AWG Wire Sizes
(2) Up to 100 feet	#12
(3) 100 to 200 feet	#10
(4) More than 200 feet	#8

C. Color Coding for phase identification shall be in accordance with Division 26 Section "Common Work Results for Electrical." All conductor insulation shall be rated at 600V AC/ 90 deg. Provide XHHW insulation for all conductors size 250 kcmil (MCM) and larger. For all other sizes provide THW or THHN/THWN insulation as appropriate for the locations where installed.

D. Provide THWN insulation for all wiring below grade and/or for all wiring subject to moisture conditions.

F. Provide dedicated parity sized neutral conductor for each branch circuit phase conductor that serves receptacles.

2.4 TYPE NM NON-METALLIC CABLES

A. Non-Metallic Sheathed Cable (NM) and Metal Clad Cable (MC) may be used as restricted below:
a. Copper conductors.
b. Sizes #12 through #8.
c. Use only in indoor dry locations where:
1) Not subject to damage.
2) Not in contact with earth.
d. Not in concrete.
e. Not where exposed or not concealed.
f. Not over suspended ceilings.
g. As restricted by NFPA 70 Article 334.

2.5 PORTABLE CORD (if required)

A. Portable Cord shall be Type S. Provide with full parity sized insulated equipment ground conductor.

B. Type S Portable Cord may be used for flexible pendant leads to outlets and equipment where indicated and only where NEC approved, where approved by local authority having jurisdiction and where prior approval is given by Engineer.

2.6 CONNECTORS FOR CONDUCTORS

A. UL-listed, factory-fabricated wiring connectors of size, ampacity rating, material, type, and class for application and service indicated. Comply with Project's installation requirements and as specified in Part 3 "Wire and Insulation Applications" Article.

PART 3 - EXECUTION

3.1 GENERAL INSTALLATION

A. Examine raceways and building finishes to receive wires and cables for compliance with requirements for installation tolerances and other conditions affecting performance of wires and cables. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Wires #6 AWG and larger shall be connected to panels and apparatus by means of approved lugs or connectors large enough to enclose all strands of the conductors. Connectors shall be of the solderless type. Solderless connectors shall be O.Z. Type XW or XTP of proper size and type required with Bakelite covers and stainless steel spring clips. Solderless lugs shall be O.Z. Type XL of proper size as required.

C. No wire shall be pulled until raceways are complete, plastering is complete and raceways are free of moisture. Joints or splices shall be permitted only at NEC approved panels, junction boxes or accessible outlet boxes. Pull conductors simultaneously where mor e than one is being installed in same raceway. Use UL listed pulling compound or lubricant, where necessary. Use pulling means including, fish tape, cable, rope or basket weave wire/cable grips which will not damage cables or raceways. Do not use rope hitches for pulling attachment to wire or cable. Conceal all work in finished spaces.

D. Install wires and cables as indicated, according to manufacturer's written instructions and NECA's "Standard of Installation."

E. Remove existing wires from raceway before pulling in new wires and cables.

F. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

G. Install exposed cables, parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

H. Support cables according to Division 26 Section "Common Work Results for Electrical."

I. Seal around cables penetrating fire-rated elements according to Division 7 Section "Firestopping."

J. Identify wires and cables according to Division 26 Section "Common Work Results for Electrical."

3.2 FIELD QUALITY CONTROL

A. Testing: On installation of wires and cables and before electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.3.1. Certify compliance with test parameters.
2. Megger all branch circuits and feeders #6 and larger. Submit results to consulting engineer. Acceptable meg ohm readings shall be per NETA standards.

B. Correct malfunctioning conductors and cables at Project site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units and retest.

END OF SECTION 26 0519

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SECTION 26 0526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes grounding of electrical systems and equipment and basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this Section may be supplemented in other Sections of these Specifications.

B. Related Sections: The following Sections contain requirements that relate to this Section:

1. Division 26 Section 0519 "Low-Voltage Electrical Power Conductors and Cables" for requirements for grounding conductors.

1.2 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data for grounding rods, connectors and connection materials, and grounding fittings.

1.3 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Erico Inc.; Electrical Products Group.
2. Galvan Industries, Inc.
3. Ideal Industries, Inc.
4. ILSCO.
5. O-Z/Gedney Co.
6. Raco, Inc.
7. Thomas & Betts, Electrical.

2.2 GROUNDING AND BONDING PRODUCTS

A. Governing Requirements: Where types, sizes, ratings, and quantities indicated are in excess of National Electrical Code (NEC) requirements, the more stringent requirements and the greater size, rating, and quantity indications govern.

2.3 WIRE AND CABLE GROUNDING CONDUCTORS

A. Comply with Division 26 Section "Low-Voltage Electrical Power Conductors and Cables." Conform to NEC Table 8, except as otherwise indicated, for conductor properties, including stranding.

1. Material: Copper. Use only copper wire for both insulated and bare grounding conductors in direct contact with earth, concrete, masonry, crushed stone, and similar materials.

B. Equipment Grounding Conductors: Insulated with green color insulation.

C. Grounding-Electrode Conductors: Stranded cable.

D. Underground Conductors: Bare, tinned, stranded, except as otherwise indicated.

E. Bare Copper Conductors: Conform to the following:

1. Solid Conductors: ASTM B 3.
2. Assembly of Stranded Conductors: ASTM B 8.
3. Tinned Conductors: ASTM B 33.

2.4 MISCELLANEOUS CONDUCTORS

A. Grounding Bus: Bare, annealed-copper bars of rectangular cross section.

B. Braided Bonding Jumpers: Copper tape, braided No. 30 AWG bare copper wire, terminated with copper ferrules.

C. Bonding Straps: Soft copper, 0.05 inch (1 mm) thick and 2 inches (50 mm) wide, except as indicated.

2.5 CONNECTOR PRODUCTS

A. Pressure Connectors: High-conductivity-plated units.

B. Bolted Clamps: Heavy-duty type.

C. Exothermic-Welded Connections: Provided in kit form and selected per manufacturer's written instructions for specific types, sizes, and combinations of conductors and connected items.

2.6 GROUNDING ELECTRODES

A. Grounding Rods: Sectional type; copper-clad steel.

1. Size: 3/4 inch by 120 inches (19 by 3000 mm).

PART 3 - EXECUTION

3.1 APPLICATION

A. Equipment Grounding Conductors: Comply with NEC Article 250 for types, sizes, and quantities of equipment grounding conductors, except where specific types, larger sizes, or more conductors than required by NEC are indicated.

1. Install equipment grounding conductor with circuit conductors for the items below in addition to those required by Code:

    a. Feeders and branch circuits.
    b. Lighting circuits.
    c. Receptacle circuits.
    d. Single-phase motor or appliance branch circuits.
    e. Three-phase motor or appliance branch circuits.
    f. Flexible raceway runs.
    g. Metal-clad cable runs.

2. Nonmetallic Raceways: Install an equipment grounding conductor in nonmetallic raceways unless they are designated for telephone or data cables.

B. Signal and Communication Systems: For telephone, alarm, voice and data, and other communication systems, provide a No. 4 AWG minimum insulated grounding conductor in raceway from grounding-electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

1. Service and Central Equipment Locations and Wiring Closets: Terminate grounding conductor on a 1/4-by-2-by-12-inch (6-by-50-by-300-mm) grounding bus.
2. Terminal Cabinets: Terminate grounding conductor on cabinet grounding terminal.

C. Separately Derived Systems: Where NEC requires grounding, ground according to NEC Paragraph 250-26.

3.2 INSTALLATION

A. General: Ground electrical systems and equipment according to NEC requirements, except where Drawings or Specifications exceed NEC requirements.

B. Grounding Rods: Locate a minimum of 1-rod length from each other and at least the same distance from any other grounding electrode.

1. Drive until tops are 2 inches (50 mm) below finished floor or final grade, except as otherwise indicated.
2. Interconnect with grounding-electrode conductors. Use exothermic welds, except at test wells and as otherwise indicated. Make these connections without damaging copper coating or exposing steel.

C. Grounding Conductors: Route along the shortest and straightest paths possible, except as otherwise indicated. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

D. Underground Grounding Conductors: Use bare copper wire. Bury at least 24 inches (600 mm) below grade.

E. Metal Water Service Pipe: Provide insulated copper grounding conductors, sized as indicated, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes by grounding-clamp connectors. Where a dielectric main water fitting is installed, connect grounding conductor to street side of fitting. Do not install a grounding jumper across dielectric fittings. Bond grounding-conductor conduit to conductor at each end.

F. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with grounding-clamp connectors.

G. Bond interior metal piping systems and metal air ducts to equipment grounding conductors of associated pumps, fans, blowers, electric heaters, and air cleaners. Use braided-type bonding straps.

3.3 CONNECTIONS

A. General: Make connections so possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.

1. Use electroplated or hot-tin-coated materials to assure high conductivity and to make contact points closer in order of galvanic series.
2. Make connections with clean, bare metal at points of contact.
3. Make aluminum-to-steel connections with stainless-steel separators and mechanical clamps.
4. Make aluminum-to-galvanized steel connections with tin-plated copper jumpers and mechanical clamps.
5. Coat and seal connections having dissimilar metals with inert material to prevent future penetration of moisture to contact surfaces.

B. Exothermic-Welded Connections: Use for connections to structural steel and for underground connections, except those at test wells. Comply with manufacturer's written instructions. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.

C. Equipment Grounding-Wire Terminations: For No. 8 AWG and larger, use pressure-type grounding lugs. No. 10 AWG and smaller grounding conductors may be terminated with winged pressure-type connectors.

D. Noncontact Metal Raceway Terminations: Where metallic raceways terminate at metal housings without mechanical and electrical connection to housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to grounding bus or terminal in housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushings and bare grounding conductors, except as otherwise indicated.

E. Connections at Test Wells: Use compression-type connectors on conductors and make bolted- and clamped-type connections between conductors and grounding rods.

F. Tighten screws and bolts for grounding and bonding connectors and terminals according to manufacturer's published torque-tightening values. Where these requirements are not available, use those specified in UL 486A and UL 486B.

G. Compression-Type Connections: Use hydraulic compression tools to provide correct circumferential pressure for compression connectors. Use tools and dies recommended by manufacturer of connectors. Provide embossing die code or other standard method to make a visible indication that a connector has been adequately compressed on grounding conductor.

H. Moisture Protection: Where insulated grounding conductors are connected to grounding rods or grounding buses, insulate entire area of connection and seal against moisture penetration of insulation and cable.

3.5 ADJUSTING AND CLEANING

A. Restore surface features, including vegetation, at areas disturbed by work of this Section. Reestablish original grades, except as otherwise indicated. Where sod has been removed, replace it as soon as possible after backfilling is completed. Restore areas disturbed by trenching, storing of dirt, cable laying, and other activities to their original condition. Include topsoiling, fertilizing, liming, seeding, sodding, sprigging, and mulching. Comply with Division 2 Section "Landscaping." Maintain restored surfaces. Restore disturbed paving as indicated.

END OF SECTION 26 0526

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SECTION 26 0529 - HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Conduit and equipment supports.
B. Fastening hardware.

1.2 QUALITY ASSURANCE

A. Support systems shall be adequate for weight of equipment and conduit, including wiring, they carry.

PART 2 - PRODUCTS

2.1 MATERIAL

A. Support Channel: Galvanized steel.
B. Hardware: Corrosion resistant.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Fasten hanger rods, conduit clamps, and outlet and junction boxes to building structure using expansion anchors, beam clamps, spring steel clips.

B. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster, or gypsum board partitions and walls; expansion anchors or preset inserts in solid masonry walls; self-drilling anchors or expansion anchor on concrete surfaces; sheet metal screws in metal studs; and wood screws in wood construction.

C. Do not fasten supports to piping, ductwork, mechanical equipment, or conduit.

D. Do not use powder-actuated anchors.

E. Do not drill structural steel members.

F. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance.

1. Use hexagon head bolts with spring lock washers under all nuts.

G. Install freestanding electrical equipment such as switchboards, motor control centers, and transformers on a housekeeping pad, minimum 4" thick and 4" overhang.

H. Install surface-mounted cabinets and panel boards with minimum of four anchors.

1. Provide steel channel supports to stand cabinet 3/4" off wall.

I. Bridge studs top and bottom with channels to support flush-mounted cabinets and panel boards in stud walls.

END OF SECTION 26 0529

SECTION 26 2416 - PANELBOARDS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes lighting and power panelboards and associated auxiliary equipment rated 600 V and less.

B. Related Sections include the following:

1. Division 26 Section "Common Work Results for Electrical" for general materials and installation methods.

1.2 SUBMITTALS

A. Product Data: For each type of panelboard, accessory item, and component specified.

B. Shop Drawings: For panelboards. Include dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:

1. Enclosure type with details for types other than NEMA 250, Type 1.
2. Bus configuration and current ratings.
3. Short-circuit current rating of panelboard.
4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
5. Wiring Diagrams: Details of schematic diagram including control wiring and differentiating between manufacturer-installed and field-installed wiring.

C. Panelboard Schedules: For installation in panelboards. Submit final versions after load balancing.

D. Maintenance Data: For panelboard components to include in the maintenance manuals specified in Division 1. Include manufacturer's written instructions for testing circuit breakers.

1.4 QUALITY ASSURANCE

A. Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1. The Terms "Listed" and "Labeled": As defined in the National Electrical Code, Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by the following:

1. Eaton Corp.; Westinghouse & Cutler-Hammer Products.
2. Siemens Energy & Automation, Inc.
3. Square D Co.

2.2 PANELBOARD FABRICATION

A. Enclosures: Flush- or surface-mounted cabinets as indicated. NEMA Type 1, unless otherwise indicated to meet environmental conditions at installed location.

1. Outdoor Locations: NEMA Type 3R.
2. Kitchen Areas: NEMA Type 4X, stainless steel.
3. Other Wet or Damp Indoor Locations: NEMA Type 4.

B. Front: Secured to box with concealed trim clamps, unless otherwise indicated. Front for surface-mounted panelboards shall be same dimensions as box. Fronts for flush panelboards shall overlap box, unless otherwise indicated.

C. Directory Frame: Metal, mounted inside each panelboard door.

D. Bus: Hard drawn copper of 98 percent conductivity.

E. Main and Neutral Lugs: Compression type.

F. Equipment Ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.

G. Service Equipment Approval: If panel shown on drawings is shown to be used for Service Entrance, provide panel listed for use as service.

H. Future Devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the overcurrent protective device ampere ratings indicated for future installation of devices.

I. Feed-through Lugs: If single-line diagram and/or panel schedules indicate feed through lugs, size lugs to accommodate feeders indicated.

2.3 LOAD CENTERS

A. Not permitted to be used.

2.4 LIGHTING AND APPLIANCE BRANCH-CIRCUIT PANELBOARDS

A. Doors: In panelboard front, with concealed hinges. Secure with flush catch and tumbler lock, all keyed alike.

2.5 DISTRIBUTION PANELBOARDS

A. Doors: In panelboard front, except omit in fusible-switch panelboard, unless otherwise indicated. Secure door with vault-type latch with tumbler lock, all keyed alike.

B. Branch-Circuit Breakers: Where overcurrent protective devices are indicated to be circuit breakers, use bolt-on circuit breakers, except circuit breakers 225-A frame size and greater may be plug-in type where individual positive-locking device requires mechanical release for removal.

2.6 OVERCURRENT PROTECTIVE DEVICES

A. Molded-Case Circuit Breaker: NEMA AB 1, handle lockable.

1. Characteristics: Frame size, trip rating, number of poles, and auxiliary devices as indicated and interrupting capacity rating to meet available fault current.

2. Application Listing: Appropriate for application, including Type SWD for switching fluorescent lighting loads and Type HACR for heating, air-conditioning, and refrigerating equipment.
3. Circuit Breakers, 200 A and Larger: Trip units interchangeable within frame size.
4. Circuit Breakers, 400 A and Larger: Field-adjustable LSI current settings.
5. Current-Limiting Trips: Where indicated, let-through ratings less than NEMA FU 1, Class RK-5.
6. Lugs: Mechanical lugs and power-distribution connectors for number, size, and material of conductors indicated.
7. Shunt Trip: Where indicated.

B. 41 circuit breakers for critical and essential critical system shall be selectively coordinated as required by NEC 700.27. Contractor shall submit to engineer coordination study from vendor to obtain approval of overcurrent device prior to ordering,

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install panelboards and accessory items according to NEMA PB 1.1.

B. Mounting Heights: Top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

C. Mounting: Plumb and rigid without distortion of box. Mount flush panelboards uniformly flush with wall finish.

D. Circuit Directory: Type directory to indicate installed circuit loads after balancing panelboard loads. Obtain approval before installing.

E. Install filler plates in unused spaces.

F. Provision for Future Circuits at Flush Panelboards: Stub four 1-inch (27-GRC) empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch (27-GRC) empty conduits into raised floor space or below slab not on grade.

G. Wiring in Panelboard Gutters: Arrange conductors into groups, and bundle and wrap with wire ties after completing load balancing.

H. Contractor shall be responsible for coordinating installation of panelboards with general contractor. Electrical Contractor shall verify all walls which shall receive panelboards and make sure that walls are minimum 6" deep to accommodate panels. If walls are not able to accommodate depth Electrical Contractor shall relocate panel to walls which are satisfactory to receive 6" depth. No additional compensation will take place for coordination of panel depth and relocation to appropriate walls.

I. Contractor shall verify prior to bidding that Loadcenter type construction is suitable for this project. Base bid shall include Panelboard type construction only unless specifically permitted by the Owner.

3.2 IDENTIFICATION

A. Identify field-installed wiring and components and provide warning signs as specified in Division 26 Section " Common Work Results for Electrical."

B. Panelboard Nameplates: Label each panelboard with engraved laminated-plastic or metal nameplates mounted with corrosion-resistant screws.

3.3 GROUNDING

A. Make equipment grounding connections for panelboards as indicated.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals, including grounding connections, according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.5 FIELD QUALITY CONTROL

A. Prepare for acceptance tests as follows:

1. Make insulation-resistance tests of each panelboard bus, component, and connecting supply, feeder, and control circuits.
2. Make continuity tests of each circuit.

B. Testing: After installing panelboards and after electrical circuitry has been energized, demonstrate product capability and compliance with requirements.

1. Procedures: Perform each visual and mechanical inspection and electrical test stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
2. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, remove and replace with new units, and retest.

C. Balancing Loads: After Substantial Completion, but not more than 2 months after Final Acceptance, conduct load-balancing measurements and make circuit changes as follows:

1. Perform measurements during period of normal working load as advised by Owner.
2. Perform load-balancing circuit changes outside normal occupancy/working schedule of the facility. Make special arrangements with Owner to avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
3. Recheck loads after circuit changes during normal load period. Record all load readings before and after changes and submit test records.
4. Tolerance: Difference exceeding 20 percent between phase loads, within a panelboard, is not acceptable. Rebalance and recheck as required to meet this minimum requirement.

3.6 CLEANING

A. On completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

END OF SECTION 26 2416

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SECTION 26 2726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes various types of receptacles, connectors, switches, and finish plates. Verify color selection with Owner's representative.

1.2 SUBMITTALS

A. Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

1. Product data for each product specified.

B. Operation and maintenance data for materials and products specified in this Section to include in the "Operating and Maintenance Manual" specified in Division 1.

1.3 QUALITY ASSURANCE

A. Listing and Labeling: Provide products that are listed and labeled for their applications and installation conditions and for the environments in which installed.

1. The Terms "Listed" and "Labeled": As defined in the "National Electrical Code," Article 100.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Switches: Leviton & Hubbell
2. Dimmers: Lutron
3. Occupany Sensor: Watt Stopper
4. Receptacles: Leviton & Hubbell
5. Wall Plates: Leviton & Hubbell
6. Multi-Outlet Assemblies: Wiremold.

2.2 SWITCHES

A. Wall Switches

1. Wall switches, in general shall be flush self-grounding with green ground screw and color coded cover, toggle type, back & side wired, specification grade, rated 20A, 120/277 volts, 1 HP at 120V, A.C quiet type. Locking type switches shall be same as below except with "L" suffix (provide six keys). Catalog numbers below are based on Leviton.

a) Single pole, toggle: CSB1-20G
b) Double-pole, toggle: CSB2-20G
c) 3-way, toggle: CSB3-20G
d) 4-way, toggle: CSB4-20G
e) Double Pole, key lock: 1222-2KL

B. Occupancy Sensor Switches

1. Occupancy sensor lighting swiches for individaul room applications shall be Watt Stopper Inc. #WS-120 or WS-277 series as required. Install these sensors at standard switch heights and locations.
2. Occupancy sensor lighting switches for special applications shall be per the Electrical Legned on the drawings, with power packs, accessories, lenses, mounting, wiring and installation methods as recommended by manufacturer for a complete working installation.

2.3 RECEPTACLES

A. Standard Grade Duplex/Single Receptacles

1. Provide duplex and single specification grade receptacles, 2-pole, 3-wire grounding, self-grounding, green grounding screw, ground terminals and poles internally connected to mounting yoke, color coded base, 15-amp and 20-amp, 125-volts, with metal plaster ears, back & side wiring, NEMA configuration 5-15R.
2. Duplex receptacles shall be as listed below.

a) Tamper Resistant Duplex Receptacle: 5320-SW
   a. Color: White

B. Ground-Fault Interrupter Standard Grade Receptacles

1. Provide self grounding commercial specification grade, duplex receptacles, ground-fault circuit interrupters; feed-thru type, capable of protecting connected downstream receptacles on single circuit, grounding type UL-rated 943, Class A, Group 1, specification grade, 20-amperes rating (device & feed-thru), 125-volts, 60 Hz; with solid-state ground-fault sensing and signaling (maximum threshold of 5 mA at .025 seconds maximum); equip with 20-ampere plug configuration, NEMA 5-15R. Design units for installation in a 2-3/4-inch (70-mm) deep outlet box without an adapter.

2. Ground fault circuit interrupter duplex receptacles shall be Leviton # D2GF1-KW series.

3. Where GFI protected receptacles are shown on the drawings, provide a separate GFI receptacle for each one shown. Do not feed downstream receptacles from load-side (GFI-protected) terminals of upstream receptacles.

C. Weatherproof cover for exterior receptacle: Leviton GFWT2-W

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install devices and assemblies plumb and secure.

B. Install wall plates when painting is complete.

C. Arrangement of Devices: Except as otherwise indicated, mount flush, with long dimension vertical, and grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

D. Protect devices and assemblies during painting.

E. Adjust locations at which floor service outlets and telephone/power service poles are installed to suit the indicated arrangement of partitions and furnishings.

F. Exterior outlets: All exterior outlets shall be of the Ground-Fault Circuit Interrupter (GFCI) Type whether or not they are indicated as such on the drawings. Exterior outlets shall also be provided with a weatherproof cover that is UL listed.

3.2 GROUNDING

A. Isolated Ground Receptacles: Connect to isolated grounding conductor routed to designated isolated equipment ground terminal of electrical system.

3.3 FIELD QUALITY CONTROL

A. Testing: Test wiring devices for proper polarity and ground continuity.

B. Test ground-fault circuit interrupter operation with both local and remote fault simulations according to manufacturer recommendations.

C. Replace damaged or defective components.

D. Cord and Plug Sets: Match voltage and current ratings and number of conductors to requirements of the equipment being connected.

E. Cord: Rubber-insulated, stranded copper conductors, with type SOW-A jacket. Grounding conductor has green insulation. Ampacity is equipment rating plus 30 percent minimum.

F. Dimmers:

1. Wattage rating exceeds connected load by 30 percent minimum, except as otherwise indicated.
2. Control: Continuously adjustable slide. Single-pole or 3-way switch to suit connections.

3.4 Wall Plates: Single and combination types that mate and match with corresponding wiring devices. Features include the following:

A. Color: White Thermoset Plastic

B. Plate-Securing Screws: Metal with heads colored to match plate finish.

C. CLEANING

3.5 General: Internally clean devices, device outlet boxes, and enclosures. Replace stained or improperly painted wall plates or devices.

END OF SECTION 26 2726

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SECTION 26 5100 - INTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Interior solid-state luminaires that use LED technology.
2. Luminaire supports.

B. Related Sections:

1. Section 26 2726 "Wiring Devices" for occupancy sensors and manual wall box dimmers.
2. Section 26 0519 “Low Voltage Electrical Power Conductors and Cables” for wire and cabling.

1.3 SYSTEM DESCRIPTION

A. Catalog numbers indicated in the Luminaire Schedule are a design series reference and do not necessarily represent the exact catalog number, size, voltage, wattage, type of light bar, driver, finish trim, ceiling type, mounting hardware or special requirements as specified or as required by the particular installations. Provide complete luminaire to correspond with the features, accessories, number of LED’s, wattage and/or size specified in the text description of each luminaire type. Additional features, accessories and options specified shall be included.

B. Provide all frames, supplementary support structures, hangers, spacers, stems, aligner canopies, auxiliary junction boxes and other hardware as required for a complete and proper installation. Recessed luminaires shall have frames that are compatible with the ceiling systems.

C. Luminaire voltage shall match the voltage of the circuit serving same.

1.4 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. IP: International Protection or Ingress Protection Rating.

D. LED: Light-emitting diode.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting fixture, including lamp, reflector, and housing.

1.5 SUBMITTALS

A. Product Data: For each type of luminaire, arranged in order of luminaire designation. Include data on features, accessories, finishes, and the following:

1. Material and physical description of luminaire including dimensions.
2. Emergency lighting units including battery and charger.
3. Energy-efficiency data.
4. Life, output (lumens, CCT, and CRI), Kelvin temperature, and energy-efficiency data for LED light bars.
5. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each luminaire type. The adjustment factors shall be for light bars, drivers, and accessories identical to those indicated for the luminaire as applied in this Project.

    a. Manufacturer Certified Data: Photometric data shall be certified by a manufacturer's laboratory with a current accreditation under the National Voluntary Laboratory Accreditation Program for Energy Efficient Lighting Products.

6. Photometric data, certified by a qualified independent testing agency, in IESNA format, based on certified results of laboratory tests of each luminaire type, outfitted with light bars, drivers and accessories identical to those indicated for the luminaire as applied in the Project.
7. Low voltage transformers.
8. LED power supplies.
9. Types of LED’s, including manufacturer, wattage, and Color Rendering Index (CRI) and color temperature in degrees Kelvin (K).

B. Shop Drawings shall:

1. Show detail of nonstandard or custom luminaires.
2. Indicate dimensions, weights, method of field assembly, components, features and accessories.
3. For custom luminaires, modified luminaires or linear luminaires mounted in continuous rows, submit scaled drawings prepared by the manufacturer showing all details of construction, lengths in runs, pendant or power feed locations, accessories, finishes and lists of materials.
4. This Contractor shall provide the manufacturer with accurate field dimensions where required.
5. Include wiring diagrams, power and control wiring.

C. Wiring diagrams shall detail wiring for luminaires and differentiate between manufacturer installed and field installed wiring.

D. Product Certificates shall be signed by manufacturers of luminaires certifying that products comply with requirements.

E. Dimming Driver Compatibility Certificates shall be signed by the manufacturer of driver certifying that drivers are compatible with dimming systems and equipment with which they are used. Product Certificates signed by product manufacturer shall be provided for each type of driver for dimmer controlled luminaires.

F. Maintenance Data shall be provided for luminaires and equipment to include in emergency, operation and maintenance manuals specified in specifications section describing Operations and Maintenance Data.

G. Field quality control test reports.

H. Special Warranties specified in the Section.

I. Review of luminaire submittals which indicate voltage, mounting condition, or quantities shall not be considered to be approval of said voltage, mounting condition or quantities. This Contractor shall field verify voltage and actual mounting condition and method.

J. Product samples complete with housing, trim, specified lumen package, and 8’ cord with plug for 120 V shall be submitted if requested.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver luminaires individually wrapped in factory fabricated fiberboard type containers.

B. Handle luminaires carefully to prevent breakage, denting and scouring of the luminaire finish.

C. Store product in a clean, dry space, protected from weather.

1.7 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to the Authorities Having Jurisdiction and marked for intended use.

C. FM Global Compliance: Luminaires for hazardous locations shall be listed and labeled for indicated class and division of hazard by FM Global.

D. Comply with NFPA 70.

E. Designated manufacturers are listed to define the requirements for quality and function of the specified product.

1.8 COORDINATION

A. Coordinate layout and installation of luminaires with ceiling system and other construction that penetrates ceilings or is supported by them including mechanical system, fire suppression, and technology and partition assemblies.

B. Provide all frames, supplementary support structures, hangers, spacers, stems, aligner canopies, auxiliary junction boxes and other hardware as required for a complete and proper

installation.

C. Recessed luminaires shall have frames that are compatible with the ceiling system indicated on the Architectural Drawings.

D. Coordination Meetings: This Contractor shall meet at least twice with the ceiling installer. Hold first meeting before submittal of shop drawings to coordinate each luminaire mounting condition with ceiling type. During second meeting, coordinate luminaire layout in each area. This Contractor shall meet at least twice with the mechanical systems installer prior to fabrication and installation of ductwork. Coordinate depth and location of all luminaires with ductwork, fire suppression, and technology in all areas.

1.9 WARRANTY

A. Comply with Division 1 requirements.

B. General Warranty: Special warranty specified in this Section shall not deprive the owner of other Rights the owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by this Contractor under requirements of the Contract Documents.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR LUMINAIRES AND COMPONENTS

A. Recessed Luminaires: Comply with NEMA LE 4 for ceiling compatibility for recessed luminaires.

B. Luminaires: Comply with UL 1598.

C. Metal Parts: Free of burrs, sharp corners and edges. Metal work shall be free of tool marks and dents and shall have accurate angles bent as sharply as compatible with the gauges of the required metal. Intersections and joints shall be formed true and of adequate strength and structural rigidity to prevent any distortion after assembly. All miters shall be in accurate alignment with abutting intersection members.

D. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging. Luminaires to be painted after fabrication. Finish ferrous mounting hardware and accessories to prevent corrosion and discoloration to adjacent materials.

E. Luminaire hardware to comply with the following material standards: For steel and aluminum luminaires, all screws, bolts, nuts and other fastening and latching hardware shall be cadmium or equivalent plated. For stainless steel luminaires, all hardware shall be stainless steel.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit relamping without use of tools. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Safety devices shall be detachable if necessary and shall not interfere with luminaire performance, maintenance or the seating of any luminaire element. Safety device shall not be visible during normal luminaire operation and from normal viewing angles.

G. Luminaires provided shall have means for disconnection from power source during service, as required in NEC Article 410.

H. Reflecting Surfaces: Minimum reflectance as follows, unless indicated otherwise:

1. White Surfaces: 85%
2. Specular Surfaces: 90%
3. Diffusing Specular Surfaces: 75%

I. Adjustable luminaires shall have positive locking devices to fix aiming angle. Luminaires shall be capable of being relamped without adjusting aiming angle.

J. Each luminaire that has an array with a beam pattern or a spread lens that defines beam orientation shall contain locking devices to insure the orientation is not disturbed during array replacement or cleaning.

K. All luminaires and drivers shall operate within the temperature limits of their design and as specified by UL in the applications and mounting conditions specified.

L. Luminaires recessed in suspended ceilings where the space above the ceiling is either an air supply or return plenum shall conform to NEC Article 300-22.

M. Provide plaster frame for recessed luminaires mounted in other than T-bar ceilings. Verify mounting with architectural reflected ceiling plan before ordering luminaires.

N. Fixtures installed in “hard” ceilings shall have all connections accessible through the luminaire.

O. For weatherproof or vapor-tight installations, finishes of luminaires and accessories shall be a premium 5 stage TGIC polyester powder coat paint minimum 2.5 mils thick, applied to factory- assembled and -tested luminaires before shipping, so that the entire assembly is completely corrosion resistant for the service intended. Exterior finishes shall have an outdoor life expectancy of not less than 20 years without any visible rust or corrosion. Where aluminum parts come in contact with bronze or steel parts, apply a coating material to both surfaces to prevent corrosion.

P. Luminaires for use outdoors or in areas designated as damp locations shall be suitable gasketed to prevent the entrance of moisture. Provide approved wire mesh screens for ventilation openings. Dissimilar metals shall be separated by non-conductive material to prevent galvanic action.

Q. Factory-Applied Labels: Comply with UL 1598. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when light bars are in place.

R. Luminaires shall be free of light leaks while providing sufficient ventilation of LED’s and drivers to provide the required photometric performance.

S. Luminaires shall hold LED arrays securely against normal vibration and maintenance handling.

2.2 LUMINAIRES

A. Housing shall be minimum code gauge steel construction painted after fabrication with high reflectance white paint unless otherwise indicated.

B. Shielding shall adhere to the following criteria:

1. Flat frosted diffuser shall be 100% virgin acrylic, pattern #12, and shall have matte finish on exterior side. Diffuser shall be of sufficient density to completely obscure LED image.
2. Flat clear lenses shall be injection molded 100% virgin acrylic.
3. Clear patterned lenses shall be injection molded 100% virgin acrylic, pattern #12.
4. Clear patterned lenses shall be polycarbonate, pattern #12.
5. Minimum thickness shall not be less than 0.125” with a minimum weight of 8 ounces per square foot.

C. Doorframes shall be supplied with concealed hinges and latches. Provide mitered corners with no gaps or light leaks.

2.3 LED LUMINAIRES AND DRIVERS

A. All Luminaires

1. Comply with IES LM-79-08 Approved Method for measuring lumen maintenance of LED light sources.
2. Comply with IES LM-80-08 Approved Method for electrical and photometric measurement of SSL product.
3. Comply with In-Situ testing for more reliable results.
4. LED’s shall be Restriction of Hazardous Substances Directive (RoHS) compliant.
5. LED arrays shall be sealed, high performance, long life type; minimum 70% rated output at 50,000 hours. (L70)
6. LED luminaires shall deliver a minimum of 80 lumens per watt.
a. LED’s shall be “Bin No. 1” quality.
7. Drivers shall be solid state and accept 120 through 277 VAC at 60 Hz input.
8. The LED light source shall be fully dimmable with use of compatible dimmers switch designated for low voltage loads.
9. LED color temperatures: **3500** as noted, +/- 275K.
10. Luminaires shall have internal thermal protection.
11. Luminaires shall not draw power in the off state. Luminaires with integral occupancy, motion, photo-controls, or individually addressable luminaires with external control and intelligence are exempt from this requirement. The power draw for such luminaires shall not exceed 0.5 watts when in the off state.
12. Color spatial uniformity shall be within .004 of CIE 1976 diagram.
13. Color maintenance over rated life shall be within .007 of CIE 1976.
14. Indoor luminaires shall have a minimum CRI of 85.
15. Luminaire manufacturers shall adhere to device manufacturer guidelines, certification programs, and test procedures for thermal management
16. LED package(s)/module(s)/array(s) used in qualified luminaires shall deliver a minimum 70% of initial lumens, when installed in-situ, for a minimum of 50,000 hours.
17. Luminaires shall be fully accessible from below ceiling plane for changing drivers, power supplies and arrays.

B. Power Supplies and Drives

1. Power Factor: 0.90 or higher
2. Maximum driver case temperature not to exceed driver manufacturer recommended in-situ operation.
3. Output operating frequency: 60Hz.
4. Interference: EMI and RFI compliant with FCC 47 CFR Part 15.
5. Total Harmonic Distortion Rating: 20% Maximum.
6. Meet electrical and thermal conditions as described in LM-80 Section 5.0.
7. Fully dimmable, 0 – 10 VDC standard.
8. Secondary Current: Confirm secondary current specified by individual luminaire

manufacturers.

9. Compatibility of dimming switches: Certified by manufacturer for use with individually specified luminaire and individually specified control components.

2.4 WIRING

A. No internal wiring shall be visible at normal viewing angles.

2.5 LUMINAIRE SUPPORT COMPONENTS

A. Single-Stem Hangers shall be 1/2-inch steel tubing with swivel ball fitting and ceiling canopy. Finish shall be the same as the luminaire.

B. Twin-Stem Hangers shall be two, 1/2-inch steel tubes with single canopy arranged to mount a single fixture. Finish shall be the same as the luminaire.

C. Rod Hangers shall be 3/16-inch minimum diameter, cadmium-plated threaded steel rod.

D. Wires shall be ASTM A 641/A 641M, Class 3, soft temper, zinc coated steel, 12 gauge.

E. Wires for humid spaces shall be ASTM A 580/A 580M, composition 302 or 304, annealed stainless steel, 12 gauge.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Luminaires:

1. Set level, plumb, and square with ceilings and walls, and secure according to manufacturer's written instructions and approved submittal materials, unless otherwise indicated.

B. Temporary Lighting: If it is necessary, and approved by Architect, to use permanent luminaires for temporary lighting, install and energize the minimum number of luminaires necessary. When construction is sufficiently complete, remove the temporary luminaires, disassemble, clean thoroughly, and reinstall.

C. Remote Mounting of Drivers: Distance between the driver and fixture shall not exceed that recommended by manufacturer. Verify, with manufacturers, maximum distance between driver and luminaire.

D. Mounting height indicated from finished floor to bottom of pendant luminaire or to the center of the outlet box for wall mounted luminaires unless otherwise noted. Verify mounting heights with Architect and Lighting Designer.

E. Mounting height may also be indicated as the length of the pendant below finished ceiling.

F. Suspended Luminaire Support:

1. Pendants and Rods: Where longer than 48 inches, brace to limit swinging.
2. Stem-Mounted, Single-Unit Luminaires: Suspend with twin-stem hangers.
3. Continuous Rows: Use tubing or stem for wiring at one point and tubing or rod for suspension for each unit length of luminaire chassis, including one at each end.
4. Do not use grid as support for pendant luminaires. Connect support wires or rods to building structure.

5. All power feeds shall originate from the same location/end of each run.
6. Where pendants or rods are longer than 48”, brace to limit luminaire swinging.

G. Provide all necessary hanging or mounting devices and accessories for all luminaires. Verify the types needed for various ceiling conditions. Plaster rings shall be provided where required.

H. Verify weight and mounting method of all luminaires prior to ordering and provide suitable support. Coordinate with General Contractor for luminaires that require additional blocking or support. Luminaire mounting assemblies shall comply with all local seismic codes and regulations.

I. Refer to architectural reflected ceiling plans for coordination of luminaire locations with mechanical, fire protection, technology and fire safety equipment. Where conflicts occur, coordinate with Architect, Engineer and Lighting Designer prior to installing any of the Systems.

J. In accessible suspended ceilings, luminaire wiring connections, including equipment grounding conductor, is to be through use of 72-inch (maximum) flexible conduit from a rigidly supported junction box.

K. Wire per requirements of branch circuit installation. Properly ground each luminaire.

L. Luminaires located in recessed ceilings with a fire resistive rating of 1 hour or more shall be enclosed in an approved fire resistive rated box equal to that of the ceiling. Acoustical ceiling tiles are not acceptable.

M. Install luminaires with vent holes free of air blocking obstacles.

N. This Contractor shall be responsible for adjusting aperture flanges or rings on all recessed luminaires to be flush with the finished ceiling. Trim shall completely conceal ceiling opening.

O. Brace suspended luminaires installed near ducts or other elements so that they do not swing into obstructions.

P. Wall mounted luminaires shall be supported from four-square outlet box plaster ring and from wall at non-feed end with two 1/4-inch toggle bolts for gypsum board walls or 1/4-inch bolts to pre-set inserts for concrete wall.

Q. Luminaires shall not be secured to ductwork or other Systems.

R. Adjust variable position lampholders for proper lamp position prior to luminaire installation.

S. Connect wiring according to Section 26 0519 "Low-Voltage Electrical Power Conductors and Cables."

3.2 DOWNLIGHT LUMINAIRES

A. Recessed Type in Accessible Ceilings: Mount in frames suitable for the ceiling with the recessed portion of the luminaire securely supported from the ceiling opening by use of a metal trim ring.

B. Recessed Type in Non-accessible Ceilings: As Specified for mounting in accessible ceilings, except provide access to wiring and driver through the ceiling opening for the luminaire.

3.3 LUMINAIRES

A. Recessed Type: Support luminaires independent of the ceiling suspension system. Provide four integral tabs (one at each corner) which rotate into position and lock on ceiling tees after luminaire is lifted into the ceiling cavity or provide four clips similar to Caddy #535. Provide mounting frames suitable for the ceiling type. In addition, provide slack earthquake safety wire hangers secured diagonally from opposite luminaire corners to structural members above suspended ceiling.

B. Wall Mounted Type: Support from four-square outlet box plaster ring and from wall at non-feed end with two ¼ inch toggle bolts for gypsum board walls or ¼ inch bolts to pre-set inserts for concrete wall.

C. If clearance above T-bar system is too restricted to "tip-in" luminaire, coordinate with acoustic ceiling installer by leaving one cross T-bar off until the cross T-bar shall be secured into its proper place. Luminaires installed in hidden-spline-type ceilings shall have supporting channels installed by Ceiling Contractor to adequately support the luminaire without providing additional hangers from the structural ceiling above the suspended ceiling.

D. Surface Mounted Type:

1. Where mounted on accessible ceilings, support from structural members above ceiling by means of hanger rods through ceiling or as approved.
2. Continuous Runs of Luminaires: Laser sight to insure luminaires are straight and true when sighting from end to end, regardless of irregularities in the ceiling. Where luminaires are so installed, omit ornamental ends between sections. All seams/ joints shall be tightly fitted.

E. Pendant Mounted Type:

1. Provide strong back channel entire luminaire length unless luminaire is designed specifically to be self-supporting.
2. Where suspended below accessible ceiling, provide structural support at suspended ceiling level from structural members above ceiling. Do not run hanger rods through ceiling.
3. Continuous Runs of Luminaires: Laser sight to insure luminaires are straight and true when sighting from end to end, regardless of irregularities in the ceiling. Where luminaires are so installed, omit ornamental ends between sections. All seams/joints shall be tightly fitted.
4. All power feeds shall originate from the same location/end of each run.

F. Install luminaire diffusers only after construction work, painting and clean up are completed.

3.4 LED LUMINAIRES

A. Adhere to manufacturers installation guidelines regarding proper thermal management.

3.5 LIGHTING CONTROL

A. Provide branch circuiting in coordination with the requirements of Division 26 Wiring Device Section and as indicated.

B. Where Quantum lighting control panels are used to sweep after hours in open areas or classrooms, provide all necessary interconnecting wiring and control modules, and local override switches for afterhours operation. Verify correct operation in presence of NU Electric Shop.

3.6 CLEANING AND ADJUSTING

A. Remove protective plastic covers from luminaires and luminaire diffusers only after construction work, painting and clean-up are completed. Remove, clean, and reinstall all dirty reflectors and diffusers.

B. Clean luminaires internally and externally after installation. Use methods and materials recommended by manufacturer for cleaning Alzak reflectors and other surfaces.

C. Make final adjustment of aimable luminaires and adjustable light settings under the direction of the Architect and/or Lighting Designer during a scheduled period of time prior to the completion of the Project, after normal business hours if required. Include all equipment and personnel expenses including overtime required for focusing.

D. Luminaires, reflectors, louvers and accessories which are damaged, blemished, or impregnated with fingerprints shall be replaced at this Contractor's expense. All finishes shall be unmarred upon Project completion.

3.7 IDENTIFICATION

A. Install labels with panel and circuit numbers on concealed junction and outlet boxes. Comply with requirements for identification specified in Section 26 0553 "Identification for Electrical Systems."

3.8 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery/generator and retransfer to normal. Walk test and verify foot-candle levels meet Code with meter.

B. Prepare a written report of tests, inspections, observations, and verifications indicating and interpreting results. If adjustments are made to lighting system, retest to demonstrate compliance with standards.

C. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

D. Replace all inoperable LED arrays at the end of construction prior to beneficial occupancy.

E. Provide instruments to make and record test results.

F. Malfunctioning Luminaires and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

3.9 ADJUSTING

A. Occupancy Adjustments: Within 12 months of date of Substantial Completion, provide on-site assistance in adjusting aimable luminaires to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose. Some of this Work may be required after dark.

1. Adjust aimable luminaires in the presence of Architect and owner representative.

END OF SECTION 26 5100

SECTION 26 5600 - EXTERIOR LIGHTING

PART 1 - GENERAL

1.1 RELATED DOCUMETNS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section provides general requirements for a complete and fully operational Exterior Lighting System including:
1. Exterior Luminaires
2. Accessories
3. Luminaire supports
4. LED Arrays
5. Controls

B. Related Sections:
1. Section 26 5100 "Interior Lighting" for exterior luminaires normally mounted on exterior surfaces of buildings.
2. Section 26 0519 “Low Voltage Electrical Power Conductors and Cables” for wire and cabling

1.3 SYSTEM DESCRIPTION

A. Catalog numbers indicated in the Luminaire Schedule are a design series reference and do not necessarily represent the exact catalog number, size, voltage, wattage, type of LED, driver, finish trim, mounting hardware or special requirements as specified or as required by the particular installations. Provide complete luminaire to correspond with the features, accessories, number of LED’s, wattage and/or size specified in the text description of each luminaire type. Additional features, accessories and options specified shall be included.

B. Luminaire voltage shall match the voltage of the circuit serving same.

1.4 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. LER: Luminaire efficacy rating.

D. Luminaire: Complete lighting fixture, LED arrays, including driver housing.

E. Pole: Luminaire support structure, including tower used for large area illumination.

F. Standard: Same definition as "Pole" above.

1.5 SUBMITTALS

A. The authorized manufacturer's representative for the Project area shall prepare Submittals for each luminaire type. In addition to the luminaire Submittals, a list shall be provided identifying the manufacturer representative for each luminaire type. Provide manufacturers' names, addresses, and telephone numbers. Requests for prior approval shall also include this information. Submittals or requests for prior approval without this information will be rejected.

B. Product Data shall indicate that luminaire, LED arrays, and drivers fully comply with Contract Documents. Data shall be submitted for each type of luminaire indicated, arranged in order of luminaire designation. For standard catalog luminaires provide original product catalog sheets indicating data on features, accessories, finishes, and the following:

1. Materials and dimensions of luminaires.
2. Photometric data, in IESNA format, based on certified results of laboratory tests of each luminaire type, outfitted with LED arrays, drivers and accessories identical to those indicated for the luminaire as applied in the Project.
   a. Photometric data shall be certified by a qualified independent testing agency.
   b. Foot-candle map including existing fixtures' contributions.
3. Low voltage transformers.
4. LED power supplies.
5. Types of LED's, including manufacturer, wattage, and Color Rendering Index (CRI) and color temperature in degrees Kelvin (K).
6. Wireless controls: nodes, gateways, modems, and server.

C. Shop Drawings shall:

1. Show details of nonstandard or custom luminaires.
2. Indicate dimensions, weights, method of field assembly, components, features, and accessories.
3. This Contractor shall provide the manufacturer with accurate field dimensions where required.
4. Include wiring diagrams, power and control wiring.

D. Wiring Diagrams shall detail wiring for luminaires and differentiate between manufacturer- installed and field-installed wiring.

E. Product Certificates shall be signed by manufacturers of luminaires certifying that products comply with requirements.

F. Maintenance Data shall be provided for luminaires and equipment to include in emergency, operation, and maintenance manuals Specified in Specifications Section describing Operations and Maintenance Data.

G. Field quality control test reports.

H. Special Warranties Specified in this Section.

I. Review of luminaire submittals which indicate voltage, mounting condition, or quantities shall not be considered to be approval of said voltage, mounting condition, or quantities. This Contractor shall field verify voltage and actual mounting condition and method.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Package poles for shipping according to ASTM B 660.

B. Store poles on decay-resistant-treated skids at least 12 inches above grade and vegetation. Support poles to prevent distortion and arrange to provide free air circulation.

C. Retain factory-applied pole wrappings on metal poles until right before pole installation. Handle with web fabric straps.

1.7 QUALITY ASSURANCE

A. Luminaire Photometric Data Testing Laboratory Qualifications: Provided by an independent agency, with the experience and capability to conduct the testing indicated, that is an NRTL as defined by OSHA in 29 CFR 1910.7.

B. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to Authorities Having Jurisdiction, and marked for intended use.

C. Comply with IESNA TM-15-11 and Addendum A for Backlight, Uplight, and Glare (BUG) ratings.

D. Comply with ANSI C7.3777.208 Standards for chromaticity of SSL products.

E. Comply with NFPA 70.

F. All luminaires shall bear a UL or ETL label.

G. Comply with IEEE C2, “National Electrical Safety Code.”

H. Designated manufacturers are listed in the Luminaire Schedule to define the requirements for quality and function of the specified product.

1.8 COORDINATION

A. Coordinate layout and installation of luminaires with plantings, paving, site walls, other site work elements, and existing luminaires.

B. Coordination Meetings: This Contractor shall meet at least twice with the sitework installer(s) Hold first meeting before submittal of shop drawings to coordinate each luminaire mounting condition and location. During second meeting, coordinate layout with other site components. Coordinate depth and location of all luminaire pole bases in all areas.

1.9 WARRANTY

A. Comply with Division 1 requirements.

B. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace products that fail in materials or workmanship; that corrode; or that fade, stain, perforate, erode, or chalk due to effects of weather or solar

radiation within specified warranty period. Manufacturer may exclude lightning damage, hail damage, vandalism, abuse, or unauthorized repairs or alterations from special warranty coverage.

1. Warranty Period for Fixture, including the LEDs, drivers and electrical components: Ten years from date of Substantial Completion.
2. Warranty Period for housing paint and finish: Ten years from date of Substantial Completion.
3. Warranty Period for Color Retention: Ten years from date of Substantial Completion.
4. Warranty Period for Poles: Repair or replace lighting poles and standards that fail in finish, materials, and workmanship within manufacturer's standard warranty period, but not less ten years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the products indicated on Drawings and/or the Schedule at the end of this document.

2.2 GENERAL REQUIREMENTS FOR LUMINAIRES

A. Luminaires shall comply with UL 1598 and be listed and labeled for installation in wet locations by an NRTL acceptable to Authorities Having Jurisdiction.

B. Comply with IESNA RP-8 for parameters of lateral light distribution patterns indicated for luminaires.

C. Comply with IESNA TM-15-07 Luminaire Classification System for Outdoor Luminaires.

D. Metal Parts: Free of burrs and sharp corners and edges.

E. Housings: Rigidly formed, weather- and light-tight enclosures that will not warp, sag, or deform in use.

F. Doors, Frames, and Other Internal Access: Smooth operating, free of light leakage under operating conditions, and designed to permit easy replacement of drivers. Designed to prevent doors, frames, lenses, diffusers, and other components from falling accidentally during relamping and when secured in operating position. Doors shall be removable for cleaning or replacing lenses.

G. Exposed Hardware Material: Stainless steel.

H. Plastic Parts: High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.

I. Light Shields: Baffles made of metal or similar sturdy material, field installable and adjustable, arranged to block light distribution to indicated portion of normally illuminated area or field.

J. Optical assemblies: where specified, full cutoff with zero uplight, “dark sky” compliant. LED assemblies shall comply with IESNA BUG rating system.

K. Reflecting surfaces shall have minimum reflectance as follows, unless otherwise indicated:

1. White Surfaces: 85 percent.
2. Specular Surfaces: 90 percent.
3. Diffusing Specular Surfaces: 75 percent.

L. Lenses and Refractors Gaskets: Use heat- and aging-resistant resilient gaskets to seal and cushion lenses in luminaire doors.

M. Luminaires utilizing internal refractors are not allowed.

N. Factory-Applied Finish for Aluminum Luminaires: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

1. Finish designations prefixed by AA comply with the system established by the Aluminum Association for designating aluminum finishes.
2. Finish: premium 5 stage TGIC polyester powder coat paint minimum 2.5 mils thick, applied to factory-assembled and -tested luminaires before shipping. Where indicated, match the finish process and color of pole or support materials.

    a. Color: See Luminaire Schedule.

O. Decorative Fixtures:

1. Shall have minimum 74 lumens per watt.

P. Outdoor Wall Mounted Area Luminaires

1. Shall have minimum 90 lumens per watt.
2. No more than 48% of the total luminaire output shall be within the forward 60-80º zone.
3. No more than 3% of the total luminaire output shall be in the forward 80-90º zone.
4. No light at or above horizontal 90-180º zone.

Q. Canopy Luminaires

1. Shall have minimum 100 lumens per watt.
2. At least 30% of total luminaire output shall be within the 40-60º zone.
3. No more than 20% of total luminaire output shall be above the 80º zone.

2.3 LED DRIVERS AND ARRAYS

A. UL 1598 listing.

B. LED arrays shall have LED’s that produce minimum 80 lumens/watt @ 525mA.

1. Lumen Depreciation Data: maintain greater than 95% lumen maintenance at 60,000 hours per IES TM-21.
2. LED color: neutral white, 4000 deg K, minimum CRI of 70, or as scheduled on the drawings.

C. LED arrays shall have an IP66 enclosure rating.

D. Driver + LED Life Rating not less than 100,000 hours.

E. Power supply / driver shall be field replaceable by means quick-disconnect connectors and easy access mounting hardware.

F. Drives shall accept 120 – 277 volts or 480 volts, 60 Hz.

G. Power Factor > 0.9@ full load.

H. THD < 20% @ full load.

I. Surge protection: 10kA/10kV per ANSI/IEEE C136.2-2014

J. The housing shall have an integral thermal management system with extruded aluminum radiation fins and lateral airways for passive cooling, no devices using moving parts are permitted.

K. Minimum starting temperature: minus 30 deg C, 40 deg C ambient.

L. Comply with IES LM-79-08 and LM-90-08 Approved Methods.

M. LED's shall be Restriction of Hazardous Substances Directive (RoHS) compliant.

2.4 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. Compatible with 7 – pin socket.

C. Contact Relays: Factory mounted, single throw, designed to fail in the on position, and factory set to turn light unit on at 1.5 to 3 fc and off at 4.5 to 10 fc with 15-second minimum time delay. Relay shall have directional lens in front of photocell to prevent artificial light sources from causing false turnoff.

1. Adjustable window slide for adjusting on-off set points.

PART 3 - EXECUTION

3.1 LUMINAIRE INSTALLATION

A. Fasten luminaire to indicated structural supports.

1. Use fastening methods and materials selected to resist seismic forces defined for the application and approved by manufacturer.

B. Adjust luminaires that require field adjustment or aiming. Include adjustment of photoelectric device to prevent false operation of relay by artificial light sources, favoring a north orientation.

3.2 CORROSION PREVENTION

A. Aluminum: Do not use in contact with earth or concrete. When in direct contact

with a dissimilar metal, protect aluminum by insulating fittings or treatment.

B. Steel Conduits: Comply with Section 26 0533 "Raceways and Boxes for Electrical Systems." In concrete foundations, wrap conduit with 0.010-inch thick, pipe-wrapping plastic tape applied with a 50 percent overlap.

3.3 GROUNDING

A. Ground metal poles and support structures according to Section 260526 "Grounding and Bonding for Electrical Systems."

1. Install grounding electrode for each pole unless otherwise indicated.
2. Install grounding conductor pigtail in the base for connecting luminaire to grounding system.
3. Provide a continuous grounding conductor in all exterior lighting circuits.

3.4 CONNECTIONS

A. Provide all required connections needed for a complete and operable system.

3.5 FIELD QUALITY CONTROL

A. Inspect each installed luminaire for damage. Replace damaged luminaires and components.

B. Replace all burned out or inoperative LED arrays at the end of Construction prior to occupancy.

C. Provide instruments to make and record test results.

D. Malfunctioning Luminaires and Components: Replace or repair, then retest. Repeat procedure until units operate properly.

E. Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

1. Verify operation of photoelectric controls.

END OF SECTION 26 5600

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SECTION 31 10 00 - SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Removing surface debris,
   2. Removing designated paving, curbs, and site development, etc.
   3. Removing topsoil and subsoil.
   4. Rough grading and site contouring.
   5. Removing trees, shrubs, and other plant life.

B. Coordinate Scope on the Civil Engineering drawings. Follow intent of the Civil Drawings, and the full extent of the requirements to provide the proposed improvements for the building construction, site and utility improvements.

C. Remove any and all unsuitable soils which may be found on the subject properties. Provide engineered, compactible sub-grade to meet the requirements of the project.

1.2 SUBMITTALS

A. Product Data: Submit data for herbicide.

PART 2 PRODUCTS

2.1 SITE CLEARING

A. Herbicide: approved by authority having jurisdiction.

PART 3 EXECUTION

3.1 PREPARATION

A. Call Local Utility Line Information service not less than three working days before performing Work. Identify all public and private utilities as is applicable to the work. Provide services of private utility location services as is applicable to the work.
   1. Request underground utilities to be located and marked within and surrounding construction areas.

3.2 PROTECTION

A. Locate, identify, and protect utilities indicated to remain, from damage.

B. Protect trees, plant growth, and features designated to remain, as final landscaping.

C. Protect bench marks, survey control points, and existing structures from damage or displacement.

3.3 CLEARING

A. Clear areas required for access to site and execution of Work.

B. Remove paving, curbs, and other site improvements to be removed.

C. Remove trees and shrubs. Remove stumps, main root ball and root system.

D. Apply herbicide to remaining stumps or plant life to inhibit growth.

3.4 REMOVALS

A. Remove debris, rock, and extracted plant life from the Site.

B. Remove paving, curbs, and existing site improvements as identified.

1. Neatly saw cut edges at right angle to surface. Replace / re-cut any failed edges for a new clean cut.

C. Remove abandoned utilities. Indicate removal termination point on as-built drawings if applicable.

D. Continuously clean up and remove waste materials from the Site. Do not allow materials to accumulate on Site.

E. Do not burn or bury materials on Site. Leave Site in clean condition.

3.5 TOPSOIL EXCAVATION

A. Excavate **topsoil from areas to be further excavated, relandscaped, or regraded without** mixing with foreign materials for use in finish grading.

B. Do not excavate wet topsoil.

C. Stockpile in area designated on Site to depth not exceeding 8 feet and protect from erosion. Stockpile material per the Civil Drawings until disposal.

D. Remove excess topsoil not intended for reuse from Site, unless directed otherwise by Owner.

3.6 ROUGH GRADING

A. Identify required lines, levels, contours, and datum.

B. Identify known underground, above ground, and aerial utilities. Stake and flag locations.

C. Notify utility company to remove and relocate utilities as applicable.

D. Excavate topsoil and subsoil from areas to be further excavated, re-landscaped or re-graded.

E. Stockpile topsoil in area designated on site.

F. Remove excess topsoil and subsoil not being reused, from site.

3.7 CLEAN UP

A. Remove debris, rock larger than 1.5 cu ft, and extracted plant life from site.

3.8 SCHEDULE

A. Refer to Civil Drawings for extent of scope and work areas.

END OF SECTION

SECTION 31 20 00 - EARTH MOVING

PART 1 GENERAL

1.1 SUMMARY

A. Section includes site grading, removal of topsoil and subsoil, building excavating and trenching, backfilling, and compacting.

PART 2 PRODUCTS

2.1 SOIL MATERIALS

A. Topsoil: Reusable excavated or Imported friable loam; free of subsoil, roots, grass, weeds, large stone, and foreign matter. ASTM D 4268, pH range of 5.5 to 7, minimum of 4 percent organic material content.
   1. Amend existing in place surface soil to produce topsoil. Verify suitability of surface soil to produce topsoil. Surface soil may be supplemented with imported or manufactured topsoil from off-site sources.

B. Subsoil: Excavated material, graded free of lumps larger than 6 inches, rocks larger than 2 inches, organic material, and debris. ASTM D 2487 Soil Classification Groups GW, GP, GM, SW, SP, and SM or a combination there of.

2.2 FILL MATERIALS

A. Type A - Select Granular Material: Coarse stone: Pit run, washed natural stone; free of shale, clay, friable material, sand, debris.
   1. Grading: AASHTO M147; Grade 57.

B. Type B: Subsoil: Reused or Imported, free of rock greater than 3 inch size and free of debris or foreign materials, etc.

2.3 ACCESSORIES

A. Geotextile Fabric: See 32 90 00.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Call OUPS to mark locations of all underground utilities a minimum of 3 working days prior to starting work.

B. Identify required lines, levels, contours, and datum.

C. Notify Architect/Engineer of unexpected subsurface conditions and discontinue affected work in area until notified to resume work.

D. Maintain and protect existing utilities to remain.

E. Provide erosion control measures to prevent erosion or displacement of soils and discharge of soil bearing water runoff of airborne dust to adjacent properties.

F. Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, and from flooding the project site and surrounding areas.

G. Verify foundation walls are braced to support surcharge forces imposed by backfilling operations.

3.2 PROTECTION OF ADJACENT WORK

A. Underpin adjacent structures which may be damaged by excavation work, including service utilities and pipe chases.

B. Grade excavation top perimeter to prevent surface water run-off into excavation or to adjacent properties.

C. Contractor shall be responsible for damage to existing utilities caused by construction operations.

3.3 TOPSOIL EXCAVATING

A. Do not excavate wet topsoil.

B. Excavate topsoil and stockpile for reuse. Remove excess topsoil not planned / required for reuse from the Site.

3.4 SUBSOIL EXCAVATING

A. Do not remove wet subsoil. Remove groundwater by pumping to keep excavations dry.

B. Excavate subsoil from areas to be further excavated, regraded, or impacted by work.

C. Excavate subsoil required for new building foundations and construction operations, and other Work.

D. Slope banks [to angle of repose or less, until shored.

E. Do not interfere with 45 degree bearing splay of foundations.

F. Correct unauthorized excavation at no cost to Owner.

G. Proof roll bearing surfaces. Fill soft spots with engineered fill and compact uniformly to 95 percent of maximum density.

H. Correct unauthorized excavation at no cost to the Owner.

I. Fill over-excavated areas under structure bearing surfaces in accordance with direction by Architect/Engineer.

J. Stockpile subsoil in area designated on site. Remove excess subsoil not being reused from site.

3.5 FILLING

A. Fill areas to contours and elevations with unfrozen materials.

B. Place fill material in continuous layers and compact, Coordinate with Civil Drawings and Geo-Technical / Special Inspection Requirements.

C. Maintain optimum moisture content of fill materials to attain required compaction density.

D. Make grade changes gradual. Blend slope into level areas.

E. Slope grade away from pavement and buildings as indicated on Civil Drawings.

F. Repair or replace items indicated to remain damaged by excavation or filling.

3.6 TRENCHING

A. Excavate for storm sewer, sanitary sewer, water, gas, electric, and other utilities per the Civil Drawings and to meet the applicable installation standards by the local municipality.

B. Cut trenches sufficiently wide to enable installation of utilities and allow inspection.

C. Hand trim excavation and leave free of loose matter.

D. Support pipe during placement and compaction of bedding fill.

E. Backfill trenches to required contours and elevations.

F. Place and compact fill materials as for Backfilling.

3.7 BACKFILLING

A. Backfill areas to contours and elevations. Use unfrozen and unsaturated materials.

B. Backfill systematically, as early as possible, to allow maximum time for natural settlement. Do not backfill over porous, wet, frozen, or spongy subgrade surfaces.

C. Place geotextile fabric over unstable subsoil.

D. Place material in continuous layers as follows:
   1. Soil Materials: Maximum 8 inches compacted depth.
   2. Fill Materials: Maximum 8 inches compacted depth.

E. Employ placement method so not to disturb or damage foundations or utilities in trenches.

F. Maintain optimum moisture content of backfill materials to attain required compaction density.

G. Backfill against supported foundation walls.

H. Slope grade away from building minimum 2 percent for a minimum distance of 10 feet, unless noted otherwise. Coordinate with Civil Drawings.

3.8 PLACING TOPSOIL

A. Place topsoil in areas where seeding, sodding, and planting is scheduled.

B. Fine grade topsoil eliminating rough or low areas. Maintain levels, profiles, and contours of subgrade.

C. Remove large stone, roots, grass, weeds, debris, and foreign material while spreading.

D. Lightly compact placed topsoil.

E. Leave stockpile area and site clean and raked, ready to receive landscaping.

3.9 SCHEDULE

A. Coordinate with Civil Engineering Drawings.

END OF SECTION

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SECTION 31 21 13 - RADON MITIGATION

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Passive Building Radon Venting system.

1.2 SYSTEM DESCRIPTION

A. Passive Radon venting system consists of the following:
   1. Permeable floor slab base course.
   2. Sealing joints, cracks, and other penetrations through floor slab.
   3. Piping to exhaust underslab air to above the roofline.

1.3 QUALITY ASSURANCE

A. Perform Work in accordance with Ohio Department of Health, ANSI/AARST Standards [SGM-SF-2023 and SGM-MFLB-2023].

B. Qualified Radon Mitigation Professional: Individual with the appropriate technical knowledge and skills specific to design and installation of systems that mitigate occupant exposure to radon gas in existing dwelling units in accordance with the certification standards of a national program such as National Radon Proficiency Program [NRPP] or Ohio Department of Health.
   1. Qualified Mitigation Professionals shall establish, maintain, and follow a written quality management program.
   2. Qualified Mitigation Professionals shall have a minimum of [3] years of experience in the design and installation of radon systems similar to the types required herein.

1.4 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by sealant manufacturer during and after installation.

PART 2 PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Installation of the gas venting and membrane barrier layer, riser pipe, and sealing methods for the slab perimeters and penetrations for the building concrete in contact with the soil, is to comply with manufacturer’s requirements, system design, and the requirements of this specification.

B. All system components are to be chemically compatible with the soil environment.

C. Gas venting and radon membrane barrier system is to be sealed at all joints, perimeters, and floor slab penetrations to provide a continuous seal of the building area in contact with the soil, as per manufacturer requirements, system design and the requirements of this specification.

D. Install and seal floor drains, void space venting layer and riser pipes in accordance with EPA standards as well as AARST standards.

E. Gas tight seals are to be provided around the surfaces of all vertical penetrations. Such surfaces are to be prepared as per manufacturer’s requirements to facilitate membrane adherence. Use an air/vapor barrier membrane (self-adhering type) of minimum 2mm thick, sealants and construction tape as required providing a continuous seal between radon membrane and any pipe, conduit or other item that penetrates the floor slab.

F. Do not allow radon mitigation systems to cause back drafting of building chimneys.

G. Do not use air cleaners as a radon reduction method.

H. Once concrete floor slab has cured sufficiently to allow work to proceed on it, apply sealant to all penetration junctions on the top side of the finished floor slab.

2.2 VOID SPACE VENTING LAYER AND MEMBRANE BARRIER SYSTEM

A. Certified Mitigation Professional shall sign off on the void space venting layer and membrane barrier system.

B. Ensure that vertical collection riser pipe extends to 12 inches above the finished floor slab. Horizontal collection / extension pipes may be required in the system design.

C. All venting layer and membrane barrier system seams are to be prepared, overlapped, and sealed per the manufacturer's recommendations.

2.3 COLLECTION, EXTENSION, AND RISER PIPES

A. The collection, extension and riser pipe locations are to be designed by the Certified Mitigation Professional. Collection pipes having a minimum thickness of 3 inches are to be placed into the void space venting & membrane barrier system layer. Size pipes per conditions.

B. The collection, extension and riser pipes are to consist of a minimum Schedule 40 nonperforated smooth walled 3 inches [inside] diameter rigid pipe of PVC, High Density PE or ABS construction. Size pipes per conditions.

C. The collection, extension and riser pipes are to be installed in accordance with the AARST requirements.

D. A single vertical riser pipe is to be installed at each location and extend from the void space to a minimum of 12 inches above the finished floor slab.

2.4 ACCESSORIES

A. Joint Cement: ASTM D2564, solvent type.

B. Fittings: Polyvinyl chloride.

C. Hangers, strapping, supports: as required to support the piping, but no more than 10’ on center vertical and 4’ on center horizontal.

D. Penetration Boot: Form using vapor retarder with stainless steel clamping ring.

E. Roof Flashing: Boot type for a steep slope shingle roof system.

F. Vent Cap: Plastic with screen to prevent insect intrusion.

G. Joint Filler: Compressible PVC foam type with recovery rate of minimum 95 percent.

H. Tape: Self-adhering type, 2 inch wide, compatible with vapor retarder.

I. Electrical Junction Box: As required for electrical connection to fan.

J. Active Soil Depressurization In-Line Tubular Centrifugal Fan: AMCA 210, UL Listed, continuous duty operation, sized for the application. [only required if an active venting system is required post installation of the passive system]

K. System Failure Warning Monitor: Provide a means to detect and announce a radon system failure with an audible or visual annunciator device. The annunciator device shall be installed in an occupied space. [only required if an active venting system is required post installation of the passive system]

L. System Monitor: Viewable operating range monitor.

M. Labels: labels for application to piping indicating “radon system piping”

N. Sealants: ASTM C920, polyurethane, Type S, Grade P for horizontal application; Grade NS for vertical application, Class 25, Use T.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify slab on grade subbase is compacted, graded, and ready to receive work.

B. Verify subbase elevations are as indicated on Drawings.

3.2 VAPOR RETARDER INSTALLATION

A. Install vapor retarder over entire base course surface at open areas of slab.

B. Lap joints minimum 12 inches. Seal laps with one continuous bead of sealant. Tape joints to retain retarder in place.

C. Inspect vapor retarder immediately before placing concrete for slab on grade.
   1. Repair tears and punctures with patches extending minimum 12 inches beyond extent of tears and punctures.
   2. Seal and tape repairs as specified for lap joints.

3.3 PASSIVE RADON SYSTEM INSTALLATION

A. Provide radon mitigation systems as indicated herein and as specified in ANSO / AARST SGM-SF.

B. All work is to be inspected, tested, documented, and signed off by the Certified Mitigation Professional.

C. Drill concrete slab where indicated on drawings, or otherwise approved by Architect and Contractor.

D. Install active radon vent piping [ASD] from below slab to above roof line. Field verify routing, placement, etc. with existing building conditions, framing, ductwork, etc. Adjust layout as required to provide a complete and functioning system. Install piping plumb and parallel to existing walls, partitions, and ceilings as appropriate, slope horizontal runs to drain, and secure in place in a rigid and substantial manner.

E. Seal slab penetrations in accordance with EPA 402-R-93-078. Prevent entry of oil gas into the building and exhausting of conditioned air via the radon mitigation system. Seal cracks and openings around the floor slab penetrations with polyurethane sealant. Provide backer rod as required. Ensure that all penetrations to the building exterior are weathertight.

F. Extend electrical junction box to location to suit installation for future ASD in-line fan.

3.4 POST INSTALLATION RADON TESTING

A. Conduct post-installation radon testing in accordance with ANSI / AARST MAH Protocol for Conducting Measurements of Radon and Radon Decay Products in Homes.

END OF SECTION

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SECTION 32 13 13 - CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Concrete paving for: paving, curbs, and sidewalks

1.2 SUBMITTALS

A. Product Data:
   1. Submit product information for concrete, cement, and aggregate materials.
   2. Submit mix design with laboratory test results supporting design.

1.3 QUALITY ASSURANCE

A. Perform Work according to City of Dayton, State of Ohio, ODOT standards as applicable.
   1. State of Ohio Department of Transportation Construction and Materials Specifications Guide shall be used as a reference for all applicable materials, construction conditions, operations, and finished products, etc.
   2. Perform Work in accordance with ACI 330.

PART 2 PRODUCTS

2.1 MATERIALS

A. Subgrade: ODOT Item 204.
   1. Compact the subgrade materials that have a maximum dry density of 100 to 105 pounds per cubic foot to not less than 102 percent of maximum dry density. Compact all other subgrade materials to not less than 100 percent of maximum dry density. Determine the maximum dry density using AASHTO T99, AASHTOT T272, or test section method in Supplement 1015.

B. Aggregate Base Course: ODOT Item 304 [304.01 and 304.02].
   1. 98% of the material's maximum dry density as determined by the modified Proctor Test (AASHTOT-180 or ASTM D-1557)

C. Concrete: ODOT Item 452 Nonreinforced Portland cement concrete pavement

D. Concrete: ODOT Item 499.
   1. Class QC 1, 4,000 PSI design strength at 28 days; 2,000 Coulombs maximum Permeability; Cement Content minimum 520 lb.; well –graded aggregate
   2. Maximum slump 4 inches.
   3. Air Content: 6% +/- 2%; ASTM C260

E. Cement: ASTM C150 Normal Type I Portland type, gray color.

F. Fine and Coarse Aggregates: ASTM C33, Class 4S.

G. Water: ASTM C94, potable, Clean, not detrimental to concrete without deleterious amounts of chloride ions.

2.2 REINFORCEMENT MATERIALS

A. Reinforcement:
   1. Reinforcing Steel: ASTM A615/A615M, 60 ksi yield grade, deformed billet bars, uncoated finish.
   2. Welded Deformed Wire Fabric: ASTM A497/A497M; in flat sheets; unfinished.
   3. Dowels: ASTM A615/A615M; 60 ksi yield strength, plain steel bars; cut to length indicated on Drawings, square ends with burrs removed; unfinished.

2.3 ACCESSORIES

A. Forms: Wood or steel material, profiled to suit conditions; conform to ACI 301.

B. Joint Filler: ASTM D1751; Asphalt impregnated wood fiberboard.

C. Reinforcement Mesh: 6x6-W1.4xW1.4 welded wire reinforcement

D. Liquid Surface Sealer: Penetrating Silane/Siloxane Sealer; clear, non-yellowing UV resistant; vapor permeable.

E. Curing Compound: ASTM C309, white pigmented water based liquid membrane.

F. Use accelerating admixtures in cold weather only when approved by the Architect/Engineer in writing. Use of admixtures will not relax cold weather placement requirements.

G. Use set retarding admixtures during hot weather only when approved by the Architect/Engineer in writing.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify gradients and elevations of base.

B. Verify compacted base is ready to support paving and imposed loads.

C. Moisten substrate to minimize absorption of water from fresh concrete.

D. Sawcut and remove existing concrete to allow installation of new concrete as indicated.

3.2 FORMING

A. Place and secure forms to correct location, dimension, and profile. Secure forms to allow the placement of concrete to be continuous and true.

B. Place joint filler in joints, vertical in position, in straight lines. Secure to formwork.

C. Place control joints at maximum 30 foot intervals. Align joints.

D. Place joint filler between paving components and other appurtenances.

E. Chamfer outside corners and edges of permanently exposed concrete. – ¾” chamfer

3.3 PLACING CONCRETE - GENERAL

A. Place concrete in accordance with ACI 330.

B. Place reinforcement to achieve pavement and concrete alignment as appropriate.

C. Check with electronic level that the correct slopes have been achieved to provide drainage.

D. Do not disturb reinforcement or formwork components during concrete placement.

E. Place concrete continuously between predetermined joints.

F. Apply surface sealer per manufacturer’s instructions.

3.4 INSTALLATION

A. Finishing:
   1. Apply surface retarder where exposed aggregate finish is required.
   2. Area Paving: Light broom.
   3. Sidewalk Surfaces: Light broom, radiused and trowel joint edges.
   4. Curbs and Gutters: Light broom.
   5. Apply curing compound on exposed concrete surfaces immediately after finishing.

END OF SECTION

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SECTION 32 92 19 – SEEDING / SITE REPAIR

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Seeding and Site Repairs related to the site development.

1.2 DEFINITIONS

A. Weeds: Vegetative species other than specified species to be established in given area.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Subgrade: Surface or elevation of subsoil remaining after completing excavation, or top surface of a fill or backfill immediately beneath planting soil.

D. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

E. Lawn Maintenance: All materials and operations necessary to establish and maintain a healthy stand of turf following initial seeding operations. Including but not limited to, mowing, fertilization, watering and treatment for weeds, fungus and disease as needed. Maintenance remains responsibility of Contractor until Project closeout or a minimum of one full growing season.

1.3 SUBMITTALS

A. Product Data: Topsoil, Seed mix, fertilizer, mulch, and other accessories.

1.4 QUALITY ASSURANCE

A. Provide seed mixture in containers showing percentage of seed mix, germination percentage, inert matter percentage, weed percentage, year of production, net weight, date of packaging, and location of packaging.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver grass seed mixture in sealed containers. Seed in damaged packaging is not acceptable.

B. Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

1.6 SCHEDULING

A. Watering: Do not begin seeding operations until a plan for watering the grass after planting and during establishment is in place and operating to provide uniform coverage of all areas to receive seed.

1.7 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than following periods:
   1. Seeded Lawns: Maintenance remains responsibility of Contractor until Project close out or a minimum of one full growing season. When full maintenance period has not elapsed before end of planting season, or if lawn is not fully established, continue maintenance during next planting season.

PART 2 PRODUCTS

2.1 SEED MIXTURE

A. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Seed Species: Seed of grass species as follows, with not less than 85 to 87 percent germination, not less than 99 percent pure seed, and not more than 0.05 percent weed seed:
   1. Turf Type Tall Fescue: Proportioned by weight as follows:
      a. 90 percent Tall Fescue (Festuca arundinacea)
         1) Three Varieties (equal three part blend.)
      b. 5 percent Perennial Rye Grass (Lolium perenne)
      c. 5 percent Kentucky Bluegrass (Poa pratensis)

2.2 SOIL AND SOIL MODIFICATION MATERIALS

A. Topsoil: ASTM D 5268, Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, free of subsoil, clay or impurities, plants, weeds and roots, free of stones 1 inch or larger. Equal to ODOT Item 653.

B. Fertilizer: Commercial fertilizer shall be used for initial preparation and shall conform to applicable state fertilizer laws. Provide fertilizer to improve existing topsoil prior to planting. Use of organic lawn fertilizer shall be used for surface application after grass is up. Fertilizer shall be uniform in composition, dry and free flowing, and shall be delivered to site in original, unopened containers, each bearing manufacturer's guaranteed analysis. Fertilizer, which becomes caked or otherwise damaged, making it unsuitable for use, will not be acceptable. Commercial-grade complete fertilizer of neutral character, consisting of fast and slow release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium.

C. Lime: ASTM C602, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

D. Organic Compost: leaf and mushroom compost to be added to mulch at 1 cubic yard per 5 cubic yards of mulch.

E. Weed-Control Additive: Preen weed control.

2.3 ACCESSORIES

A. Hydro / Paper Fiber Mulch: Recycled newsprint that is shredded for purpose of mulching seed.
   1. Application: 30 percent of mulch mixture.

B. Straw Mulch: Provide air-dry, clean, mildew, weed, and seed-free, salt hay or threshed straw of wheat, rye, oats, or barley.

2.4 EROSION CONTROL MATERIALS

A. Erosion-Control Blankets: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches long.

B. Erosion-Control Fiber Mesh: Biodegradable burlap or spun-coir mesh, a minimum of 0.92 lb/sq. yd. (0.5 kg/sq. m), with 50 to 65 percent open area. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

C. Erosion-Control Mats: Cellular, non-biodegradable slope-stabilization mats designed to isolate and contain small areas of soil over steeply sloped surface, of **3-inch** nominal mat thickness. Include manufacturer's recommended anchorage system for slope conditions.

2.5 SOURCE QUALITY CONTROL

A. Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

B. Provide recommendation for fertilizer and lime application rates for specified seed mix as result of testing.

C. Testing is not required when recent tests and certificates are available for imported topsoil. Submit these test results to testing laboratory. Indicate, by test results, information necessary to determine suitability.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine areas to receive lawns and grass for compliance with requirements and other conditions affecting performance.
   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.
   1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
   2. Protect grade stakes set by others until directed to remove them.
   3. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 LAWN PREPARATION

A. Limit lawn subgrade preparation to areas to be planted.

B. Newly Graded Subgrades (6 months or less): Loosen subgrade to a minimum depth of 4 inches. Remove stones larger than 1/2 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
   1. Apply fertilizer directly to topsoil/subgrade before loosening, per results of topsoil analysis.
   2. Spread to a depth of 6 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

C. Unchanged Subgrades (7 months or greater): If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
   1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
   2. Loosen surface soil to a depth of at least 6 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
      a. Apply fertilizer directly to surface soil before loosening per results of topsoil analysis.
   3. Remove stones larger than 1/2 inch in any dimension and sticks, roots, trash, and other extraneous matter.
   4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

D. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

E. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, restore areas if eroded or otherwise disturbed after finish grading.

3.4 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

B. Mulch: Hydromulch seeded areas at rate of 1800 pounds per acre. Use Bowie hydromulcher or equal to apply mulch, unless otherwise noted.
   1. Application: Apply 70 percent wood cellulose fiber and 30 percent paper fiber mulch.
   2. Protect seeded areas from hot, dry weather where irrigation is not available or drying winds by applying straw mulch where slope does not exceed 6:1. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
      a. Anchor straw mulch by crimping into topsoil with suitable mechanical equipment or bond straw mulch by spraying with asphalt emulsion at the rate of 10 to 13 gal./1000 sq.ft. Take precautions to prevent damage or staining of structures or other plantings adjacent to mulched areas. Immediately clean damaged or stained areas.

3.5 SEEDING

A. Sow seed with seeding machine. Do not broadcast or drop seed. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other.
   1. Do not use wet seed or seed that is moldy or otherwise damaged.
   2. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer.

B. Sow seed at a total rate of 5 to 8 lb/1000 sq. ft.

C. Roll lightly and water with fine spray.

D. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

E. Protect seeded areas with erosion-control mats where shown, installed and anchored according to manufacturer's written instructions.

F. Protect seeded areas by spreading straw mulch. Spread uniformly at a minimum rate of 2 tons/acre to form a continuous blanket 1-1/2 inches in loose depth over seeded areas. Spread by hand, blower, or other suitable equipment.
   1. Anchor straw mulch by crimping into soil with suitable mechanical equipment.

3.6 SEED PROTECTION

A. Identify seeded areas with stakes and string around area periphery.

3.7 LAWN RENOVATION

A. Renovate existing lawn.

B. Renovate existing lawn damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles.
   1. Reestablish lawn where settlement or washouts occur or where minor regrading is required.
   2. Provide new topsoil as required.

C. Strip sod and vegetation from diseased or unsatisfactory lawn areas; do not bury in soil.

D. Remove topsoil containing foreign materials resulting from Contractor's operations, including oil drippings, fuel spills, stone, gravel, and other construction materials, and replace with new topsoil.

E. Mow, dethatch, core aerate, and rake existing lawn.

F. Remove weeds before seeding. Where weeds are present, apply selective herbicides as required. Do not use pre-emergence herbicides.

G. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property.

H. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches.

I. Apply soil amendments and initial fertilizers required for establishing new lawns and mix thoroughly into top 4 inches of existing soil. Provide new planting soil to fill low spots and meet finish grades.

J. Apply hydro seed or seed and protect with straw mulch as required for new lawns.

K. Water newly planted areas and keep moist until new lawn is established.

3.8 LAWN MAINTENANCE

A. Begin maintenance immediately after each area is planted and continue until acceptable lawn is established, but for not less than following periods:
   1. Seeded Lawns: Maintenance remains responsibility of Contractor until Project close out or a minimum of one full growing season.

B. Maintain and establish lawn by watering as applicable to installation and application methods, fertilizing, weeding, mowing, trimming, replanting, and other operations. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth lawn. Provide materials and installation the same as those used in the original installation.

C. Watering: Provide and maintain temporary piping, hoses, and lawn-watering equipment to convey water from sources.

D. Mow lawn as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet.

E. Fertilization: Apply fertilizer after initial mowing and when grass is dry.

END OF SECTION

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SECTION 32 93 00 - PLANTING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
   1. Trees, shrubs, plants
   2. Preparation of soil and fertilizer.
   3. Placement of plant life.

1.2 SUBMITTALS

A. Product Data: Submit list of plant material sources, data for fertilizer and other accessories.

B. Comply with ANSI Z60.1, “American Standard for Nursery Stock,” for trees, shrubs, ground covers, and plants.

1.3 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Include pruning objectives, types and methods; types, application frequency, and recommended coverage of fertilizer.

1.4 QUALIFICATIONS

A. Nursery: Company specializing in growing and cultivating plant life specified in this section.

B. Qualifications of workmen: Provide at least one person who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of materials being installed and the best methods for their installation and who shall direct all work performed under this section.

C. Maintenance Services: Performed by installer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver exterior plants freshly dug.
   1. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

B. Do not prune trees and shrubs before delivery except as approved by Architect. Protect bark, branches, and root systems from sun scald, drying, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of exterior plants during delivery. Do not drop exterior plants during delivery and handling.

C. Handle planting stock by root ball.

D. Deliver exterior plants after preparations for planting have been completed and install immediately. If planting is delayed more than six hours after delivery, set exterior plants and trees in shade, protect from weather and mechanical damage, and keep roots moist.
   1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
   2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
   3. Do not remove container-grown stock from containers before time of planting.
   4. Water root systems of exterior plants stored on-site with a fine-mist spray. Water as often as necessary to maintain root systems in a moist condition.

1.6 PROJECT CONDITIONS

A. Protection After Delivery: Cover the balls of "B & B" plants, which cannot be planted immediately on delivery with moist soil, mulch, or other protection from drying winds and sun. Plant bare-rooted plants or heel-in immediately upon delivery. Water plants as necessary until planted.

B. Time of Planting: Conduct planting operations under favorable weather conditions during the next season or seasons, which are normal for such work as determined by accepted practice in the locality of the Project. Seasons for these plantings are: spring planting, March 10 through May 10, fall planting, August 20 through November 30.

1.7 WARRANTY

A. Furnish two year warranty including one continuous growing season including coverage of plants from death or unhealthy conditions.

B. Replacements: Plants of same size and species as specified, planted in next growing season, with new warranty beginning on date of replacement.

1.8 MAINTENANCE SERVICE

A. Maintain seeded areas and plant life for three months from Date of Substantial Completion. Seeded areas and plant life shall be well established and exhibit growth at the time of turn over to Owner.

PART 2 PRODUCTS

2.1 TREES, PLANTS, AND GROUND COVER

A. Trees, Plants and Ground Cover: Species and size identified in Plant Schedule as indicated on Drawings, grown in climatic conditions similar to those in locality of the Work.
   1. Furnish nursery-grown trees and shrubs complying with ANSI Z60.1, with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock free of disease, insects, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

B. Balled and Burlapped Shrubs: Well-shaped, fully branched, healthy, vigorous nursery-grown stock.

C. Ground Covers and Plants: Established and well rooted in removable containers or integral peat pots.

D. Fertilizer For Plantings: Fertilizer shall be 20-10-5 Agriform Planting tablets manufactured by Sierra Chemical Company, 1-408-263-8080 or equal and suitable for application with approved equipment. Delivered to the site in bags or other convenient containers, each fully labeled, conforming to applicable State Fertilizer Law, and bearing the name, trade name or trademark, and warranty of the producer.

2.2 SOIL AND SOIL MODIFICATION MATERIALS

A. Topsoil: ASTM D 5268, Fertile, agricultural soil, typical for locality, capable of sustaining vigorous plant growth, free of subsoil, clay or impurities, plants, weeds and roots, free of stones 1 inch or larger. Equal to ODOT Item 653.

B. Fertilizer: Fifty percent of elements derived from organic sources,

C. Lime: ASTM C602, Class T agricultural limestone containing a minimum 80 percent calcium carbonate equivalent.

D. Organic Shredded Hardwood Bark Mulch: Well aged and free from deleterious materials and suitable as a top dressing of trees and shrubs,

E. Weed-Control Barrier: Polypropylene or polyester nonwoven fabric.

F. Organic Compost: leaf and mushroom compost to be added to mulch at 1 cubic yard per 5 cubic yards of mulch.

G. Tree Gator Bags

H. Weed-Control Additive: Preen weed control.

2.3 ACCESSORIES

A. Landscape fabric: doubly reinforced polypropylene fabric with a 28-mil thickness. Install under all new landscape areas.

2.4 ROUNDED LANDSCAPE STONE

A. Washed rounded river stone, ¾" diameter nominal. Free of soil and debris.

PART 3 EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify required underground utilities are in proper location.

B. Prepare subsoil to eliminate uneven areas. Maintain profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

C. Scarify subsoil to depth of 6 inches.

3.2 PLACING TOPSOIL

A. Spread topsoil to minimum depth of 6 inches. Rake smooth.

B. Grade topsoil to eliminate rough, low or soft areas. Slope for positive drainage.

C. Place topsoil into pits and beds intended for plant root balls to minimum thickness of 6 inches.

D. At affected areas of the site, strip existing topsoil and stockpile for reuse. Spread as required to meet new grades.

E. Provide additional fill as required to complete the work. Additional fill material shall be free of organic matter, rubbish, debris, and rocks greater than 4" diameter.

3.3 PLANTING

A. Install landscape fabric at landscape beds. Install 3 inch mulch bed at all landscape areas.

B. Set plants in pits or beds partly filled with prepared topsoil mixture. Backfill soil mixture.

C. Saturate soil with water when pit or bed is half full of top soil and again when full.

D. General:
   1. All plantings shall be done between the dates of March 1 and June 1 or September 1 and November 1. All other plantings to be done between the dates of June 2nd and August 31 to be Wilt Proofed (or equal) and a watering schedule shall be maintained by the Contractor until acceptance by Owner.
   2. Plant areas: Planting areas are pits, or prepared planting beds, for trees, shrubs and vines where indicated on the drawings.
   3. Topsoil for planting operations shall be furnished by the Contractor.
   4. The depth of planting areas is the depth below the finished grade.

E. Shrub pits:

1. Dig and prepare shrub pits or beds prior to planting to a minimum depth of 8".
2. Width of the pits - at least greater in diameter than their ball of earth or spread of roots.
3. Add 21 gram 'Agriform' planting tablets, to planting pit, manufactured by Sierra Chemical Co. (1-408-263-8080) or equal. Backfill planting pit halfway with planting soil mixture and place tablet beside rootball about 1" from root tips. Do not place in bottom of hole. Follow manufacture's recommended application rates for size of plant installed.
4. Set shrubs so as to allow sufficient depth. Properly set the crown of plant at the finished surface of the bed.
5. Backfill topsoil about the roots and thoroughly settle by watering. Form a mound of earth around each shrub so as to produce a shallow saucer.
6. Edge the bed in a neat line as directed and make sure an even 6" layer of topsoil remains over entire area.
7. Dress all beds with a uniform 3" layer of finely shredded hardwood bark.

F. Tree Gator Bags:
1. Contractor to supply and install tree gator bags on all trees planted.
2. Contractor to be responsible for proper filing and maintenance of tree gator bags until acceptance by owner.

3.4 TREE STABILIZATION

A. Trunk Stabilization: Unless otherwise indicated, provide trunk stabilization as follows:
1. Upright Staking and Tying: Stake trees of 2- through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip-out. Use a minimum of 2 stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend one third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Use 2 stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; 3 stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
3. Support trees with two strands of tie wire encased in hose sections at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

3.5 MAINTENANCE

A. Mow grass at regular intervals to maintain maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing. Contractor to maintain through at least 3 mowings.

B. Contractor to water to prevent grass and soil from drying out.

C. Control growth of weeds.

3.6 GUARANTEE PERIOD

A. Guarantee period shall begin at the issuance of the Substantial Completion and shall end exactly two years from that date.

B. At the conclusion of the guarantee period, a final inspection of the work will be made to determine the condition of the plant material. All plant material not in a healthy or 40% defoliated growing condition will be noted.

C. Remove the material so noted from the site at the direction of the Architect and replace during the following planting season with the materials of like kind and size and in a manner specified for the original planting at no extra cost.

D. Guarantee period also applies to replaced material.

END OF SECTION