PROJECT SPECIFICATIONS
PROJECT MANUAL

FOR

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK 2714 HOLLY PARK DR

PROPOSAL NO. 1588

LOUISVILLE METRO HOUSING AUTHORITY
CAPITAL IMPROVEMENTS DEPARTMENT
420 South Eighth Street
Louisville, Kentucky 40203

LISA OSANKA
Executive Director and Contracting Officer

SHERMAN CARTER BARNHART ARCHITECTS

February 22, 2023

PROJECT MANUAL INDEX

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SECTION A

ADVERTISEMENT / INVITATION FOR BIDS

The Louisville Metro Housing Authority of Louisville, Kentucky, will receive sealed bids, in triplicate, for the contract work entitled:

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL NO. 1588

PRE-BID MEETING: A pre-bid meeting will convene at **10:00 A.M. Local Time on Tuesday, March 7, 2023** at 3223 South Seventh Street Road, Louisville, Kentucky 40216. The project will be available for viewing on the same day as the pre-bid meeting from 1:00 P.M. to 4:00 P.M.

BID OPENING: Sealed Bids will be accepted at Louisville Metro Housing Authority (Purchasing Department) 3223 South Seventh Street Road, Louisville, Kentucky 40216 up to **10 A.M. Local Time on Tuesday, March 28, 2023.** Only bidder's prices and verification of submittal of required forms will be revealed at that time. Individuals wishing to review bid information must submit a written request to LMHA's Purchasing Agent at Webb@LMHA1.org.

SILENT PERIOD: the "Silent Period" runs from the Bid Opening Date until the bid is awarded. During this time, no calls from prospective bidders will be taken by the Project Team or the Project Architect, and no emails will be answered. During this time, any questions regarding the bids shall be directed to the Purchasing Agent via email at Webb@LMHA1.org.

Bidder's financial information will not be revealed at any time.

Direct procedural questions to:

Michelle Chandler, Program Manager
Capital Improvements Department
Louisville Metro Housing Authority
420 S. Eighth Street, Louisville, KY 40203
(502) 569-6314

Questions concerning technical issues should be directed to:

Matthew Montgomery
Sherman Carter Barnhart Architects
114 Turner Commons Way, Suite 110
Lexington, KY 40508
(859) 224-1351

OFFICIAL BIDDING DOCUMENTS: may be obtained from the Louisville Metro Housing Authority's e-Procurement Marketplace at:

https://ha.economicengine.com/requests.html?company_id=9038, or visit our website at http://www.lmha1.org/bid_opportunities/index.php

FOR THE USE OF CONTRACTORS, SUBCONTRACTORS, AND MATERIAL SUPPLIERS: the project plans and specifications are on file for reference, at:

CMD: 30 Technology Parkway South, Suite 100, Norcross, GA 30092; Phone: 1-800-424-3996; https://www.constructconnect.com

Builders Exchange of Louisville: 2300 Meadow Drive, Louisville, KY 40218; Phone: (502) 459-9800; Fax: (502) 459-9803; http://www.bxkentucky.com

McGraw – Hill Construction Dodge / AGC: 4300 Beltway Place, Suite 150, Arlington TX 76018; Phone: 1-800-393-6343; Email: support@construction.com; https://www.construction.com

Allied Construction Industries: 3 Kovach Drive, Cincinnati, OH; Phone: (513) 221-8020; Fax: (513) 221-8023; and

BidTool / CDC: 2001 9th Avenue, 2nd Floor Vero Beach, FL 32960; Phone: 1-800-652-0008; Email: service@cdcnews.com; https://www.cdcnews.com/bidtool-lmp.

MWDBE GOALS AND SECTION 3 OPPORTUNITIES: the project will provide opportunities for Section 3 Residents and Section 3 Business Concerns. Bidders shall contact Phil Reidinger, LMHA's MWDBE and Section 3 Coordinator, at (502) 569-4922 or Email at: Reidinger@LMHA1.org for information on Section 3, MBE, WBE or DBE participation or to certify MBE, WBE and DBE businesses as such prior to the bid submission silent period.

The Louisville Metro Housing Authority is an equal opportunity employer and is committed to affirmative action in the involvement of minority business to the maximum extent possible. LMHA encourages MBE, FBE and DBE firms or individuals to respond. Non-minority firms or individuals are requested to seek participation of minority, female and disabled owned businesses as subcontractors or in partnership arrangements to the maximum extent possible. The specifications contain detailed information regarding MBE, FBE and DBE participation and prevailing wage requirements.

NOTICE TO BIDDERS: The Louisville Metro Housing Authority reserves the right to accept any bid, or portion thereof, reject any or all bids, to waive any informalities in bids received where such acceptance, rejection, or waiver is considered to be in the best interest of the Louisville Metro Housing Authority and to reject any bid where evidence or information submitted by the bidder does not satisfy the Louisville Metro Housing Authority that the bidder is qualified, capable of carrying out the requirements of the Contract Documents or is in any manner unresponsive in the preparation of its bid.

By: Lisa Osanka, Executive Director and Contracting Officer

END OF SECTION A

SECTION B

INSTRUCTIONS TO BIDDERS FOR CONTRACTS
PUBLIC AND INDIAN HOUSING PROGRAMS
(Form HUD-5369)

AND

REPRESENTATIONS, CERTIFICATIONS, AND OTHER STATEMENTS OF BIDDERS
PUBLIC AND INDIAN HOUSING PROGRAMS
(Form HUD-5369-A)

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] —

[ ] (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;

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

[ ] (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 [ ] 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.

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

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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.

(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	[ ] Asian Pacific Americans
[ ] Hispanic Americans	[ ] Asian Indian Americans
[ ] Native 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)

SECTION C

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

SUPPLEMENTAL INSTRUCTIONS TO BIDDERS

Any bidder who submits the Form of Bid, consisting of Section D of these documents ("Project Manual"), certifies that it understands that the Bid Form must be fully and properly completed to be considered responsive. The Bidder also certifies that it fully understands the points set out below and warrants that it will comply with same. Failure to comply with any portion of this section may be grounds for rejection of bid. Those points are as follows:

I. Substitutions

A. Generally

In most circumstances, LMHA will consider substitute materials in lieu of those specified in the solicitation. Bidders wishing to submit bids inclusive of substitute materials are directed to Section J for guidance.

II. Bid Preparation and Submission

A. Alternate Bids

Paragraph 1. (f) of the Instructions to Bidders for Contracts, HUD-5369, is revised as follows:

Unless expressly authorized elsewhere in this solicitation, alternate bids and/or qualifying statements may not be considered.

III. Amendments to Invitations for Bids

A. Acknowledgment of Receipt

Paragraph 3. (b) of the Instructions to Bidders for Contracts, HUD-5369, is revised as follows:

Bidders must acknowledge receipt of all amendments (addenda), if any, in the space provided on the Form of Bid provided in the Official Bid Package. Bids which fail to acknowledge the Bidder's receipt of any amendment may result in rejection of the bid if the amendment(s) contained information that substantively changed the PHA's requirements.

B. Availability and Delivery

Paragraph 3. (c) of the Instructions to Bidders for Contracts, HUD-5369, is deleted and replaced by the following language:

Amendments will be on file in the offices of the PHA as far in advance of the bid opening date as is feasible. Amendments will be transmitted to plan rooms (listed in Section A, Advertisement for Bids), plan holders and will be posted on LMHA's Website / e-Procurement Marketplace as soon as possible after they are generated and will be included in all bid packages released thereafter.

IV. Responsibility of Prospective Contractor

A. Evaluation Factors

Paragraph 4. (a)(1), (2), (3), and (4) of the Instructions to Bidders for Contracts, HUD-5369, are deleted and replaced by the following, non-exclusive list:

1. Possession of adequate financial resources, or the ability to obtain such resources, as required for the performance of the work under this project;

2. Ability to fulfill all bonding and insurance requirements of this project;

3. Past performance and conduct on LMHA projects;

4. Ability to comply with the required performance schedule, taking into consideration all existing business commitments;

5. Record of satisfactory performance (particularly with reference to participation on any previous or current Louisville Metro Housing Authority projects);

6. Record of integrity and business ethics;

7. Qualification and eligibility to receive Government contracts;

8. Possession of regularly employed personnel with the experience, trade skills, and proficiency needed to perform the work as specified;

9. Possession of the necessary organization, experience, operational controls, and technical skills; and

10. Possession of adequate production capacity, construction and technical equipment, and facilities.

The Louisville Metro Housing Authority may, as a condition of determining a bidder's responsibility, require a bidder or any proposed subcontractor to submit information demonstrating that entity's possession of the above qualifications.

V. Late Submissions, Modifications, and Withdrawal of Bids

A. Evidence of Time of Receipt

Paragraph 5. (d) of the Instructions to Bidders for Contracts, HUD-5369, is supplemented as follows:

The official timepiece of the Louisville Metro Housing Authority is the clock in the Conference Room of the Louisville Metro Housing Authority's Purchasing Department, located at 3223 South Seventh Street Road, Louisville, Kentucky 40216 (or other such device as may be located there and designated for the purpose of official time keeping).

B. Mistakes in Bids

Paragraph 5. (h) is added to Instructions to Bidders for Contracts, HUD-5369, as follows:

A low bidder alleging a non-judgmental mistake may be permitted to withdraw its bid if the mistake is clearly evident on the face of the bid document, but the intended bid price is unclear or the bidder submits convincing evidence that a mistake was made. Subsequent to the bid opening, no changes in bid prices or other provisions of bids prejudicial to the interest of the Louisville Metro Housing Authority, the integrity of the Louisville Metro Housing Authority's procurement process, or fair and open competition, shall be permitted.

VI. Service of Protest

A. Delivery of Protest to Owner

Paragraph 7. (b) of the Instructions to Bidders for Contracts, HUD-5369, is supplemented as follows:

Lisa Osanka, Contracting Officer
Louisville Metro Housing Authority
420 S. Eighth Street
Louisville, KY 40203

B. Grounds for Protest

Paragraph 7. (d) is added to the Instructions to Bidders for Contracts, HUD-5369, as follows:

Written protests must state with particularity the specific grounds upon which the protest is founded. Specific grounds may include, but are not necessarily limited to: late submittal, failure to submit all required information, submittal of alternate or qualified bids, etc.

PROTESTS OF SOLICITATIONS must be delivered to the Louisville Metro Housing Authority prior to the time of the bid opening.

PROTESTS OF CONTRACT AWARD must be delivered to the Louisville Metro Housing Authority not more than ten (10) calendar days after the contract is awarded.

VII. Contract Award

A. Deletion of Paragraph 8. (g)

Paragraph 8. (g) is hereby deleted from the Instructions to Bidders for Contracts, HUD-5369, and is henceforth without force or effect.

VIII. Bid Guarantee

A. Return of Bid Bond

The following additional language is added to paragraph 9 of the Instructions to Bidders for Contracts, HUD-5369:

Bidders desiring the return of their bid bonds must submit a written request to:

Steve Webb
Louisville Metro Housing Authority
420 S. Eighth Street
Louisville, KY 40203

IX. Assurance of Completion

A. Replacement of Paragraph 10. (a)

Paragraph 10 of the Instructions to Bidders for Contracts, HUD-5369, is revised as follows:

1. Paragraphs 10. (a)(1), 10.(a)(2), 10.(a)(3), 10.(a)(4), and 10.(a)(5) are hereby deleted and are henceforth without force or effect.

2. The above referenced portions of Paragraph 10. (a) are replaced by the following language:

This assurance must be separate Payment and Performance Bonds, each in a penal sum of 100% of the contract price. Such assurance shall be provided on the forms included in Sections "G" and "H".

X. Proposed Subcontractors

A. Identification of Proposed Subcontractors in Bid

Paragraph 13(a) is hereby added to the Instructions to Bidders for Contracts, HUD-5369, as follows:

1. A listing of proposed subcontractors (including second and third tier subcontractors), for each category of work intended to be subcontracted, must be included in the *Form of Supplemental Bid Information*. This information MUST BE SUBMITTED WITH THE BID PACKAGE.

2. If the Bidder proposes to employ multiple subcontractors in the same category of work, each of the proposed subcontractors must be listed in the Form of Supplemental Bid Information. If the Bidder does not intend to employ subcontractors on this project, it must state "No Subcontractors Intended" on the forms provided. Failure to comply with these requirements is ground for rejection of the bid.

3. If instructed to do so, the apparent low bidder shall submit, within 24 hours after the bids are opened a completed Form LMHA Form 7000, Request for Acceptance of a Subcontractor, for each proposed subcontractor. Failure to submit this information is ground for rejection of the bid.

4. Proposed replacements for submitted subcontractors shall not be considered unless 1) the Louisville Metro Housing Authority rejects an originally proposed subcontractor or 2) a previously accepted subcontractor proves incapable of performing the work or shows cause for removal under the conditions of the contract. Replacement of a

subcontractor, for any reason, shall be done at no additional cost to the Louisville Metro Housing Authority.

5. Subcontractors not identified at the time of bid, as described in Subsection (a) above, are not eligible to work on this project unless specific approval is granted, in writing, by the Louisville Metro Housing Authority. If such approval is granted all of the above referenced provisions, and all related provisions, shall apply to the substituted subcontractor(s) as if they had been submitted at the time of bid.

B. Exception to Paragraph 13(a)

Paragraph 13(b) is hereby added to the *Instructions to Bidders for Contracts*, HUD-5369, as follows:

1. The requirements of Paragraph 13(a) notwithstanding, bidders are not required to identify waste haulers, if any, proposed to perform waste hauling incidental to and as a service of waste storage, treatment, or disposal facilities, to be considered responsive.

2. The preceding provisions apply only to the bidding process. The bidder, if any, awarded the Contract, must identify all proposed subcontractors in accordance with the applicable provisions of the Contract and shall not employ any subcontractor unless and until LMHA approves such entity.

XI. Lead-Based Paint

A. Use Prohibited

Paragraph 14 is hereby added to the Instructions to Bidders for Contracts, HUD-5369, as follows:

Any bidder awarded a Louisville Metro Housing Authority contract for modernization shall comply with 24 CFR Part 35 prohibiting the use of lead-based paint.

The construction and rehabilitation of residential structures with assistance provided under this Agreement is subject to the HUD Lead-Based Paint regulations, 24CFR Part 35. Rehabilitation of residential structures shall be made subject to the provisions for the elimination of lead-based paint hazards under Subparts A, B, J, K, and R of said regulations.

XII. Responsive Bidder

A. General Requirements

Paragraph 17(a) is hereby added to the Instructions to Bidders for Contracts, HUD-5369, as follows:

To be considered responsive, a bid must comply in all respects with the requirements of the Official Bid Package, submit all required documentation and certificates, and acknowledge any addenda thereto so that all bidders stand on equal footing and the integrity of the competitive procurement system is maintained.

XIII. Part 5 Requirements

Paragraph 20 is hereby added to the *Instructions to Bidders for Contracts,* HUD-5369, as follows:

This Agreement is subject to the requirements set forth in 24 CFR Part 5, including but not limited to:

1. Section 5.105(c) prohibiting the participation of debarred, suspended or ineligible contractors or participants in the programs covered by this Agreement. See 24 CFR 2.2424 for the prohibitions on the use of debarred, suspended, or ineligible contractors or participants in HUD programs.
2. Section 5.105 (d) concerning the requirements of The Drug-Free Workplace Act of 1988 (41 USC 701 et seq.) and HUD's implementing regulations at 24 CFR part 21.
3. Section 5.212 concerning the requirements of the Privacy Act (5 USC 552a) concerning the collection, maintenance, dissemination and use of social security numbers, EINs and other income information of applicants, and the providing of a Privacy Act Notice to same.

XIV. Representations, Certifications, and Other Statements of Bidders

A. Items of Special Interest

Bidders are advised to thoroughly familiarize themselves with and ensure completion of the following portions of Form HUD-5369-A:

Paragraph 1. (b)(2)(i); Paragraph 7. (a), (b), and (c); Paragraph 8.(a) and (b); Paragraph 13.

XV. Certificate of Independent Price Determination

A. Statement Regarding Disclosure

Paragraph 1. (c) of the Representations, Certifications, and Other Statements of Bidders, HUD-5369-A, is replaced by the following language:

Bidders shall not delete or modify Paragraph 1. (a)(2) and any disclosure pertaining thereto must be submitted with the bid and must bear the signature of the bidder's authorized agent.

B. Non-Collusive Affidavit

Paragraph 1. (d) of the Representations, Certifications, and Other Statements of Bidders, HUD-5369-A, is applicable to all contracts, regardless of dollar amount. Subsection 1. (d)(2) is hereby deleted and henceforth is without force or effect. Subsection 1. (d)(1) is revised as follows:

Each bidder shall complete the Non-Collusive Affidavit form, provided in the Official Bid package, and submit that form with its bid. Failure to submit this document is ground for rejection of the bid.

XVI. Multi-Day Bid Process

A. Highlights about the Multi-Day Bid Process

The Louisville Metro Housing Authority has a MULTI-DAY BID PROCESS, described as follows:

BID OPENING DATE ("1st Day Submittals"):

1. To be turned in by *all prospective bidders on the official Bid Opening Date and time* at 3223 South 7th Street Road, Louisville, KY, 40216.

2. All items listed in the "1st Day Submittals" list for all prospective bidders *must be included in the* "1st Day Submittals" *Bid Package, shall be fully and properly completed (no blank spaces or unanswered fields) and shall include any listed required forms or documents in order to be considered a "Responsive Bid"* (the "Required Bid Document Submission Checklist" can be found on "Section C, Page 7" and in the "Official Bid Package").

3. *Failure to submit a complete* "1st Day Submittals" *Bid Package as described above, and elsewhere in the Project Manual, on this date, time and location is grounds for immediate bid rejection.*

4. *ONLY the apparent low bidder with a "Responsive Bid" will be contacted by LMHA to submit the "2nd Day Submittals".*

POST-BID OPENING DATE ("2nd Day Submittals"):

1. To be turned in ONLY by the apparent low bidder AFTER BEING CONTACTED BY LMHA, on behalf of himself and all subcontractors (including 2nd and 3rd Tier subcontractors) working under this project.

2. The "2nd Day Submittals" *must be turned in by 2:00 pm two days after bid opening (52 hours)*, at LMHA's Main Office located at 420 S. 8th St., Louisville, KY 40203 (to the Attention of Phil Reidinger).

3. All items listed in the "2nd Day Submittals" list for the General Contractor and all Subcontractors (including 2nd and 3rd Tier Subcontractors) *must be included in the* "2nd Day Submittals" Bi*d Package, shall be fully and properly completed (no blank spaces or unanswered fields) and shall include any listed required forms or documents in order to be considered a "Responsive Bid"* (the "Required Bid Document Submission Checklist" can be found on "Section C, Page 7" and in the "Official Bid Package").

a. Any prospective bidders that *will not be utilizing subcontractors are not required to achieve the MWDBE Goals*, as described on Section M of the Project Manual.

b. Any prospective bidders that *will be utilizing subcontractors (including 2nd and 3rd Tier Subcontractors) will be required to meet the MWDBE Goals*. If the goals cannot be met due to limitations on the scope of work that can be subcontracted, the unavailability of MWDBE subcontractors for the required trades, or any other reasons, then the prospective bidder shall submit a "waiver request" to LMHA, as described on Section M of the Project Manual.

c. Any prospective bidders that *will be utilizing subcontractors (including 2nd and 3rd Tier Subcontractors) will be required to do at least 12% of the work (based on total bid amount) by its own work force. The "General Conditions" and "Bonds" do not count toward the 12% requirement. Failure to meet this requirement is grounds for immediate bid rejection.*

4. *Failure to submit a complete* "2nd Day Submittals" *Bid Package as described above, and elsewhere in the Project Manual, on this date, time and location is grounds for immediate bid rejection.*

5. *ONLY the lowest "Responsive Bid" will be evaluated for "Responsibility" to determine if the bid is "awardable". If the lowest "Responsive Bid" is not "awardable", the LMHA will contact the proposer with the next low bid to submit the* "2nd Day Submittals" *for evaluation. The process will continue in this manner until a bid proposal is found to be "awardable".*

5. Bidders are advised that the Louisville Metro Housing Authority reserves the right to accept any bid, or portion thereof, reject any or all bids, to waive any informalities in bids received where such acceptance, rejection, or waiver is considered to be in the best interest of the Louisville Metro Housing Authority and to reject any bid where evidence or information submitted by the bidder does not satisfy the Louisville Metro Housing Authority that the bidder is qualified, capable of carrying out the requirements of the Contract Documents or is in any manner unresponsive in the preparation of its bid.

BID REVIEW PERIOD (From Bid Opening Date Until Bid Award):

1. SILENT PERIOD: the "Silent Period" runs from the Bid Opening Date until the bid is awarded. During this time, no calls from prospective bidders will be taken by the Project Team or the Project Architect, and no emails will be answered. During this time, any questions regarding the bids shall be directed to the Purchasing Agent via email at Webb@LMHA1.org.

B. Required Bid Document Submission Procedure and Checklist

The Louisville Metro Housing Authority has a MULTI-DAY BID PROCESS. The following list describes the "1st Day Submittals" and the "2nd Day Submittals" Bid Packages.

1ST DAY SUBMITTALS / BID PACKAGE FOR THE GENERAL CONTRACTOR:

- Section B

_____ Pages 1–3 (ONLY Form HUD 5369-A – "Representations, Certifications and Other Statements of Bidders")

- Section D

_____ Pages 1 – 3 ("Form Of Bid Bond")

_____ Page 4 ("Certificate As to Corporate Principal")

_____ Pages 5 – 6 ("Affidavit of Non-Collusion")

_____ Page 7 ("Addenda Acknowledgement and Bid Form")

_____ Bid Bond (shall be 5% of Bid Amount by accredited Bonding Company,, as described in the Project Manual)

- Section E

_____ Page 1 ("Supplemental Bid Information")

_____ Pages 5 - 6 ("Bidder's Qualifications")

_____ Pages 7 - 10 (Form HUD 2530" - "Previous Participation Certification")

- Section M — MBE, Section 3 and EEO Contract Requirements, Forms and Documents

_____ Page 24 ("Legitimacy of Joint Venture ") IF NOT APPLICABLE, WRITE "NOT APPLICABLE"

_____ Page 25 ("Details of Joint Venture Agreement") IF NOT APPLICABLE, WRITE "NOT APPLICABLE"

2nd DAY SUBMITTALS / BID PACKAGE FOR THE GENERAL CONTRACTOR:

- Section E

_____ Page 2 ("List of Materials and Equipment")

_____ Page 3 ("List of Proposed Subcontractors / 2nd and 3rd Tier Subcontractors")

- Section M — MBE, Section 3 and EEO Contract Requirements, Forms and Documents

_____ Page 15 ("Schedule of MBE, WBE and DBE Participation")

_____ Page 16 ("MBE, WBE and DBE Waiver Request Information Sheet")

_____ Page 17 ("List of Proposed Subcontractors")

_____ Page 18 ("Non-MBE, WBE, DBE Subcontractor/Suppliers Form")

_____ Page 19 ("Employment Demographics")

_____ Page 21 ("Agreement to Notify LMHA of Job Openings")

_____ Page 22 ("Statement of Intent to Perform as an MBE Contractor/Subcontractor") IF APPLICABLE. Must include a copy of the MBE certification as required in this form.

_____ Page 23 ("Affidavit of Minority Business Enterprise") IF APPLICABLE

_____ Minority, Women, Disabled Person Owned Business Enterprise Certification IF APPLICABLE

2ND DAY SUBMITTALS / BID PACKAGE FOR NON-MINORITY, WOMEN, DISABLED PERSON OWNED BUSINESS SUBCONTRACTORS

NOTICE TO BIDDERS: these documents must be submitted for all subcontractors, including 2nd and 3rd Tier Subcontractors, that will be working on this project. The General Contractor is responsible for all document submissions for subcontractors, including 2nd and 3rd Tier Subcontractors.

- Section E

_____ Page 2 ("List of Materials and Equipment")

_____ Page 3 ("List of Proposed Subcontractors / 2nd and 3rd Tier Subcontractors")

_____ Pages 4 ("Affidavit of Subbider")

- Section M - MBE, Section 3 and EEO Contract Requirements, Forms and Documents

_____ Page 19 ("Employment Demographics")

_____ Page 21 ("Agreement to Notify LMHA of Job Openings")

2ND DAY SUBMITTALS / BID PACKAGE FOR MINORITY, WOMEN, DISABLED PERSON OWNEDBUSINESS SUBCONTRACTORS

NOTICE TO BIDDERS: these documents must be submitted for all subcontractors, including 2nd and 3rd Tier Subcontractors, that will be working on this project. The General Contractor is responsible for all document submissions for subcontractors, including 2nd and 3rd Tier Subcontractors.

- Section E

_____ Page 2 ("List of Materials and Equipment")

_____ Page 3 ("List of Proposed Subcontractors / 2nd and 3rd Tier Subcontractors")

_____ Pages 4 ("Affidavit of Subbider")

- Section M — MBE, Section 3 and EEO Contract Requirements, Forms and Documents

_____ Page 19 ("Employment Demographics")

_____ Page 21 ("Agreement to Notify LMHA of Job Openings")

_____ Page 22 ("Statement of Intent to Perform as an MBE Contractor/Subcontractor") Must include a copy of the MBE certification as required in this form.

_____ Page 23 ("Affidavit of Minority Business Enterprise") IF APPLICABLE

_____ Minority, Women, Disabled Person Owned Business Enterprise Certification

FAILURE TO SUBMIT ALL REQUIRED BID DOCUMENTS
IS GROUNDS FOR IMMEDIATE BID REJECTION

END OF SECTION C

SECTION D

FORM OF BID

- Form of Bid
- Form of Bid Bond
- Certificate as to Corporate Principal
- Affidavit of Non-Collusion

FORM OF BID BOND

Louisville Metro Housing Authority
420 South Eighth Street
Louisville, Kentucky 40203

Gentlemen:

We, the signatories, state that we or our representatives have visited the sites of the proposed work on _____, 20_____ and have fully familiarized ourselves with all conditions affecting the cost of the work and with the specifications [including Advertisement for Bids, Instructions to Bidders (HUD-5369), Representations, Certifications, and Other Statements of Bidders (HUD-5369-A), Supplemental Instructions to Bidders, MBE Requirements, Bid Proposal and forms, to include this page, Form of Bid Bond, Non-Collusive Affidavit, Schedule of MBE Participation, Schedule of MBE Unavailability, Addenda, if any thereto, Supplemental Bid Information, Form of Contract, Form of Performance Bond, Form of Payment Bond, General Conditions (HUD-5370), Supplemental General Conditions, Special Conditions, Specifications, Project Manual and Drawings on file in the Capital Improvements Department Louisville Metro Housing Authority, Kentucky, and having examined the work sites and the documents titled above hereby propose to furnish all labor, materials, equipment and services required to complete the work entitled:

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL No. 1588

In submitting this bid it is understood and agreed that the Louisville Metro Housing Authority reserves the right to accept any bid, or portion thereof, reject any or all bids, to waive any informalities in bids received where such acceptance, rejection, or waiver is considered to be in the best interest of the Louisville Metro Housing Authority and to reject any bid where evidence or information submitted by the bidder does not satisfy the Louisville Metro Housing Authority that the bidder is qualified, capable of carrying out the requirements of the Contract Documents or is in any manner unresponsive in the preparation of its bid.

If written notice of intent to award the contract connected with this bid is mailed, telegraphed or delivered to the undersigned within sixty (60) days after the opening thereof, or at any time thereafter, unless the bid is withdrawn in writing, the undersigned agrees to execute and deliver a contract in the prescribed form and furnish the required bonds and meet other stipulated requirements within ten (10) days after the contract is presented to him/her for signature.

KNOW ALL MEN BY THESE PRESENTS, That we the undersigned,

_____
(NAME OF PRINCIPAL)
as Principal, and

_____
(NAME OF SURETY)

as Surety, are held and firmly bound unto the Louisville Metro Housing Authority, Louisville, Kentucky, hereinafter called the "LMHA", in the penal sum of _____ DOLLARS, lawful money of the United States of America, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors 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_____, for:

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL No. 1588

NOW, THEREFORE, the Principal shall not withdraw said bid within the sixty (60) day period specified therein after the opening of the same, and shall within the ten (10) day period specified after the prescribed forms are presented to him/her for signatures, enter into a written contract with the LMHA 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 sixty (60) day period specified, or the failure to enter into such contract and give such bond within the time specified, the Principal shall be obligated and shall pay the LMHA the difference between the amount specified in said bid and the amount for which the LMHA may procure the required work or supplies, or both, if the latter amount be in excess of the former, as the full force and virtue of this Bid Bond shall so provide.

NOTE:	**Failure to complete and submit <u>THIS</u> bond form is ground for bid rejection.**

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

PRINCIPAL

Name _____

Business Address of Corporate Principal _____

BY: _____
(Representative's Signature) **AFFIX CORPORATE SEAL**

TITLE: _____

ATTEST: _____
(Signature)

NAME: _____
(Print or type)

SURETY

Name and Business _____
Address of **Corporate**
Surety: _____

BY: _____
(Representative's Signature) **AFFIX CORPORATE SEAL**

TITLE: _____

ATTEST: _____
(Signature)

NAME: _____
(Print or type)

POWER OF ATTORNEY FOR PERSON SIGNING FOR SURETY COMPANY MUST BE ATTACHED HERETO.

NOTE:	**Failure to complete and submit THIS form is ground for bid rejection.**

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the
(Printed name of Corporate Officer)

_____ of the Corporation named as
(Title of Corporate Officer)

Principal in the within bond; that _____who,
(Representative who signed as Principal above)

signed the said bond on behalf of the Principal was then the _____
(Title of Representative)

of said Corporation; that I knew his/her signature, and his/her signature thereto is genuine;

and that said bond was duly signed, sealed and attested to for and in behalf of said

Corporation by Authority of its governing body.

AFFIX CORPORATE SEAL

BY: _____
(Signature of Corporate Officer)

TITLE: _____
(Print or Type)

Instructions: "Corporate Officer" means any authorized officer of the firm submitting this bid, **except** the person who signed the bid bond as "Representative" on behalf of the bidding firm.

"Name of Representative" means the person who signed the bid bond (preceding page) on behalf of the bidding firm.

Names and titles of persons associated with the Surety should not appear on this page.

NOTE: Failure to complete and submit THIS form is ground for bid rejection.

AFFIDAVIT OF NON-COLLUSION

State of _____,

County of _____,

_____, being first duly sworn,
(Printed name of Representative)

deposes and says:

That he or she is _____
(A Partner, Officer, etc. of bidding firm)

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, conspired, connived, or agreed, directly or indirectly, with any bidder or person, to submit a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference with any person, to fix the bid price of affiant or any other bidder, or to fix any overhead, profit, or cost element of said bid price, or of that of any other bidder, or to secure any advantage against the Louisville Metro Housing Authority or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

BY: _____
(* Signature)

Subscribed and sworn to before me this _____ day

of _____, 20___.

Signature of Notary: _____

AFFIX SEAL
OF NOTARY

My commission expires: _____.

* Signature of: 1. Bidder, if the bidder is an individual; 2. Partner, if the bidder is a partnership; or 3. Corporate Officer, if the bidder is a corporation.

NOTE: Failure to complete and submit THIS form is ground for bid rejection.

The Bidder represents that it ___ **has** ___ **has not** participated in a previous contract or subcontract subject to the equal opportunity clause prescribed by Executive Orders 10925, 11114, or 11246, or the Secretary of Labor; that it ___ **has** ___ **has not** filed all required compliance reports; and that representations indicating submittal of required compliance reports, signed by proposed subcontractors, will be obtained prior to subcontracts being awarded. The above representation need not be submitted in connection with contracts or subcontracts which are exempt from the clause.

Certification of Non-Segregated Facilities - By signing 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, or will be, maintained. The Bidder agrees that a breach of this certification is a violation of the Equal Opportunity clause of the Contract Documents. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, rest rooms and wash rooms, restaurants and other eating areas, parking lots, time clocks, locker rooms and other storage or dressing areas, drinking fountains, recreation, break, or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are, in fact, segregated on the basis of race, color, religion, or national origin, or because of habit, local custom, or otherwise. The Bidder further agrees that (except where it has obtained identical certifications from proposed subcontractors for specific time periods) it will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000.00 which are not exempt from the provisions of the Equal Opportunity clause; that it will forward a notice to proposed subcontractors as provided in the Instructions to Bidders.

The penalty for making false statements in offers (10 year imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

ADDENDA ACKNOWLEDGEMENT AND BID FORM

RECEIPT OF ADDENDA IS ACKNOWLEDGED FOR:

ADDENDUM NUMBER	ADDENDUM DATE	
_____	_____	Attach additional
_____	_____	sheets if
_____	_____	necessary

BIDDERS MUST SUBMIT BASE BID TO BE CONSIDERED RESPONSIVE.

☐ **Check box if claiming status as a '*Section 3Business Concern*' and supply certification.**

BASE BID:

AMOUNT OF BASE BID FOR (Use words)

_____DOLLARS AND _____CENTS,

($_____).
(Use figures)

DATE: _____

NAME OF FIRM: _____

ADDRESS: _____

BY: _____
(Representative's Signature)

AFFIX CORPORATE SEAL

TITLE: _____
(Print or type)

BIDDERS ARE CAUTIONED TO ENSURE THAT ALL INFORMATION REQUESTED IN SECTIONS B, D, AND E OF THIS SOLICITATION HAS BEEN PROVIDED IN FULL AND ACCURATE DETAIL. FAILURE TO DO SO MAY RENDER THE BID NONRESPONSIVE.

The penalty for making false statements in offers (10-year imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

END OF SECTION D

SECTION E

SUPPLEMENTAL BID INFORMATION

- Bidder's Point of Contact
- Lists of Materials and Equipment
- List of Proposed Subcontractors
- Affidavit of Sub-Bidder
- Bidder's Qualifications
- Form HUD 2530

SUPPLEMENTAL BID INFORMATION

These documents are a supplement to the bid proposal. These forms must be submitted, at the time and place of the bid opening, in a sealed envelope, separate from Section D, *Form of Bid*. This supplemental information will be used for bid analysis and evaluation.

Failure to submit any required information is grounds for rejection of bid!

The Louisville Metro Housing Authority (LMHA) reserves the right to waive any formalities and/or accept, reject, or negotiate any or all offerings, representations, or proposals contained in this section of the bid submittal. Upon execution of the contract, all representations made herein shall become part of the contract and shall be equally as binding as any other portion of the Contract Documents (unless expressly rejected by LMHA prior to execution of the contract). The preceding sentence notwithstanding, the burden of proof of equality of all methods, equipment, and materials listed in this section to those indicated in the project specifications or drawings is on the Bidder.

Indicate below, the name and phone number of the individual who may be contacted to supply or clarify information required in connection with this bid.

NAME: _____ PHONE: _____

TITLE: _____ EMAIL: _____

Alternate Contract:

NAME: _____ PHONE: _____

TITLE: _____ EMAIL: _____

Bidder's Business Address (PO Box is not acceptable):

_____

_____

_____

Bidder's Federal Employer ID Number: _____

LIST OF MATERIALS AND EQUIPMENT

Each bidder shall indicate the brand name of materials and/or equipment it proposes to use if awarded this contract.

The bidder shall clearly identify the materials and/or equipment that it proposes to furnish. Stating "as per plans and specifications" is not sufficient identification. If the bidder identifies the name or brand of materials and/or equipment which does not conform to the requirements of this solicitation, as determined by LMHA, the bidder will be required to substitute that item with an item which does meet the requirements of this solicitation at no additional cost to LMHA, whether or not such conflict is discovered by LMHA prior to contract award.

MATERIALS/EQUIPMENT NAME OR BRAND

1. _____
2. _____
3. _____
4. _____
6. _____
7. _____
5. _____
6. _____

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

Use additional Sheets If Necessary

LIST OF PROPOSED SUBCONTRACTORS

LIST OF PROPOSED SECOND AND THIRD TIER SUBCONTRACTORS

All proposed subcontractors who propose to employ third tier subcontractors must provide the below referenced information for each proposed third tier subcontractor. Proposed third tier subcontractors are subject to the approval of LMHA. PROPOSED SECOND AND THIRD TIER SUBCONTRACTORS AND SUBCONTRACT AMOUNTS SHALL NOT BE CHANGED, NOR SHALL ANY ADDITIONAL THIRD TIER SUBCONTRACTORS BE EMPLOYED, WITHOUT THE EXPRESS WRITTEN CONSENT OF THE LOUISVILLE METRO HOUSING AUTHORITY.

Subcontractor: _____Category of Work: _____
(From previous page)

2nd Tier Sub: _____$ Amount: _____

Is 2nd Tier Sub an MWDBE: Yes or No (Circle one)

3rd Tier Sub: _____$ Amount: _____

Is 3rd Tier Sub an MWDBE: Yes or No (Circle one)

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

Subcontractor: _____Category of Work: _____
(From previous page)

2nd Tier Sub: _____$ Amount: _____

Is 2nd Tier Sub an MWDBE: Yes or No (Circle one)

3rd Tier Sub: _____$ Amount: _____

Is 3rd Tier Sub an MWDBE: Yes or No (Circle one)

Use Additional Sheets If and As Necessary

AFFIDAVIT OF SUBBIDDER

ONE FORM FOR EVERY PROPOSED SUBCONTRACTOR MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

_____, being first duly sworn, deposes and says:
(Name of Officer or Partner)

That he is _____of the firm of _____,
(Officer or Partner) (Name of firm)

the party making a certain proposal or bid dated_____, 20____

to _____for subcontract work in connection
(Name of Prime Contractor)

with the Louisville Metro Housing Authority's Project, located in Louisville, Kentucky, and the party proposed by said work as a result of said bid, that such bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion, or communication or conference, with any person, to fix the bid price or affiant or of 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 Louisville Metro Housing Authority or any person interested in the proposed contract; and that all statements in said proposal or bid are true.

Signature of Bidder (Officer or Partner)

_____

Subscribed and sworn to before me this _____day of _____, 20_____.

Attest: _____
(Signature of Notary)

SEAL OF
NOTARY

My commission expires _____20_____.

BIDDER'S QUALIFICATIONS

The bidder presently has the following jobs under contract and bonded (list all projects currently under contract and bonded; use additional sheets if necessary):

1. _____
(Project name/description) (Owner or Architect)

Contract Amount: $_____ % Complete: _____

Percentage completed with Bidder's own forces and nature of Bidder's involvement:

2. _____
(Project name/description) (Owner or Architect)

Contract Amount: $_____ % Complete: _____

Percentage completed with Bidder's own forces and nature of Bidder's involvement: _____

3. _____
(Project name/description) (Owner or Architect)

Contract Amount: $_____ % Complete: _____

Percentage completed with Bidder's own forces and nature of Bidder's involvement:

4. _____
(Project name/description) (Owner or Architect)

Contract Amount: $_____ % Complete: _____

Percentage completed with Bidder's own forces and nature of Bidder's involvement: _____

BIDDER'S QUALIFICATIONS (CONTINUED)

State the average number of workers the bidder regularly employs -- on its own full-time payroll and without regard to this project -- in each of the following classifications (the bidder shall write-in all classifications it deems appropriate and attach additional sheets if necessary):

Classification or description of duties	Average # of full-time employees in this classification

We, the bidder, will perform _____% of the work under this contract with our own forces. List trades:

We, the bidder, normally perform _____% of the work with our own forces. List trades:

Approximately _____% of our company's total employees are members of a racial minority.

Approximately _____% of our company's total employees are not members of a racial minority.

BY: _____ Date: _____
(Authorized Officer's Signature)

The penalty for making false statements in offers (10 years imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

OMB Approval No. 2502-0118
(Exp. 11/30/2022)

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)**

Certifications: The controlling participants(s) listed above hereby apply to HUD or USDA FmHA, as the case maybe, for approval to participate as controlling participant(s) in the role(s) and project listed above. The controlling participant(s) certify that the information provided on this form and in any accompanying documentation is true and accurate. I/we 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. The controlling participants(s) further certify to the truth and accuracy of the following:

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.

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.
Purpose: The information collected by form HUD-2530 is required for principals applying to participate in multifamily programs to 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.
Routine Use: The information collected by this form will not be otherwise disclosed outside of HUD, except to public agencies and private sector sources for automated processing of your records and for requesting information about you for participant approval; to appropriate agencies, entities, and persons when it is reasonably necessary to mitigate a breach or related incident; to Federal, state and/or local agencies when relevant to civil, criminal, or regulatory investigations and prosecutions or for other inquiries.
Disclosure: Providing the information is voluntary. You must provide all information requested in this application, including your SSN. Without prior approval or information, a controlling participant may not participate in a proposed or existing multifamily or healthcare project.
SORN ID/URL:https://www.govinfo.gov/content/pkg/FR-2016-07-29/pdf/2016-18026.pdf

Public reporting burden for this collection of information is estimated to average three 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. This agency may not collect this information, and you are not required to complete this form, unless it displays a currently valid OMB control number.

A response is mandatory. Failure to provide any of the information will result in your disapproval of participation in this HUD program.

END OF SECTION E

SECTION F

FORM OF CONTRACT

THIS AGREEMENT, made this____day of_____, by and between _____, (hereinafter referred to as "Contractor"), and the Louisville Metro Housing Authority, (hereinafter referred to as "LMHA").

WITNESSETH, that the Contractor and the LMHA, for the consideration stated herein, mutually agree as follows:

ARTICLE 1 - Statement of Work: The Contractor, having visited and thoroughly inspected the site of the work, and having satisfied itself that all costs associated with the work under this contract are included in its bid and this contract, shall furnish all labor, materials, equipment, and services to complete all work required in strict accordance with the Specifications, Project Manual, Drawings, and other documents which comprise the total Contract Documents for the project titled:

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL No. 1588

and any addenda thereto, and any Drawings referred to therein, all as prepared by LMHA, and said Specifications, Addenda, Amendments and Drawings are incorporated herein by reference and made a part hereof.

ARTICLE 2 - Contract Price: The LMHA shall pay the Contractor for the performance of the Contract in accordance with the terms and conditions of the Contract Documents, in current funds, subject to additions, deductions, and withholdings as provided in the Contract Documents, the sum of **$_____.**

ARTICLE 3 - Contract Documents: The Contract consists of the following component parts:

a. This Instrument
b. Addenda (if any)
c. Supplemental Instructions to Bidders
d. Instructions to Bidders (HUD-5369)
e. Representation, Certifications and Other Statement of Bidders (HUD-5369 A)
f. Supplemental General Conditions
g. General Conditions (HUD-5370)
h. Abatement General Conditions
i. Special Conditions
j. Supplemental Bid Information
k. Technical Specifications
l. Project Manual
m. Large Scale Drawings
n. Small Scale Drawings
o. Shop Drawings
p. Form of Bid

This Instrument, together with all Documents enumerated in the above Articles, are as fully a part of this Contract as if hereto attached or herein repeated, and together form this Contract. In the event any

provision of any component part shall be in conflict with any other component part, the provision of the component part first enumerated in Article 3 above shall govern, except as otherwise specifically stated. The various provisions in addenda shall be construed in the order of preference of the component part of the Contract which each modifies.

ARTICLE 4 - Liquidated Damages: As actual damages for delay in completion of Work are impossible to determine, the Contractor and his Surety shall be liable for and shall pay to LMHA the sum of $1,000.00, not as a penalty, but as fixed, agreed and liquidated damages for each calendar day of delay until the Contract Work is substantially completed as defined in the General Conditions. LHMA shall have the right to deduct liquidated damages from money in hand otherwise due, or to become due, to the Contractor, or to sue and recover compensation for damages for failure to substantially complete the Work within the time stipulated in the contract documents. Said liquidated damages shall cease to accrue from the date of Substantial Completion.

ARTICLE 5 – Dispute Resolution: Any dispute or claim under this contract that cannot be resolved by and between the parties shall be submitted to litigation in the Jefferson County Kentucky Circuit Court.

ARTICLE 6 – Governing Law: This contract shall be construed and enforced pursuant to the applicable laws of the Commonwealth of Kentucky.

ARTICLE 7 – Entire Agreement: This Contract supersedes all prior agreements, contracts and understandings, whether written or otherwise, between the parties relating to the subject matter of the project. This contract may only be amended or altered by a written Addendum, signed by both parties and incorporated by reference herein.

IN WITNESS WHEREOF, the parties hereto have caused This Instrument to be executed in three (3) original counterparts as of the day and year first above written. Contractor hereby certifies that it has received all documents listed in Article 3 hereof.

_____
(Contractor)

BY: _____
(Authorized Representative)

_____
(Printed Name and Title)

BUSINESS ADDRESS: _____

Attest: _____
(Signature of Notary)

_____
Contractor

_____
LMHA

SEAL OF NOTARY

My commission expires _____, 20_____.

LOUISVILLE METRO HOUSING AUTHORITY
Louisville, Kentucky

BY: _____
Lisa Osanka, Executive Director and Contracting Officer

BUSINESS ADDRESS: Louisville Metro Housing Authority
420 South Eighth Street
Louisville, Kentucky 40203

Attest: _____
(Signature of Notary)

SEAL OF NOTARY

My commission expires _____, 20_____.

CERTIFICATIONS

I, _____, certify that I am the
(Printed Name of Company Officer)

_____ of the Firm named herein as Contractor;
(Printed Title of Company Officer)

and that_____, who signed this Contract on
(Name of Authorized Representative)

behalf of the Contractor, was then_____
(Title of Authorized Representative)

of said Firm by authority of its governing body, and at that time had the authority to execute this

Contract within the scope of the Corporate powers.

BY: _____
(Signature of Company Officer)

AFFIX CORPORATE SEAL

Instructions: "Officer" means any authorized officer of the contracting firm, except the person who signed the contract (preceding page) as "Authorized Representative" on behalf of the Contractor.

"Authorized Representative" means the person who signed the contract (preceding page) on behalf of the Contractor.

END OF SECTION F

SECTION G

FORM OF MATERIAL/LABOR PAYMENT BOND

FORM OF MATERIAL/LABOR PAYMENT BOND

If desired, other forms may be attached, but this form must be properly completed and shall prevail.

DATE OF EXECUTION: _____

NAME OF PRINCIPAL: _____
(CONTRACTOR)

NAME OF SURETY: _____

NAME OF OWNER: Louisville Metro Housing Authority

AMOUNT OF BOND (100% of Contract Price): _____

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL No. 1588

KNOW ALL MEN BY THESE PRESENTS, that we the PRINCIPAL AND SURETY above named, are held and firmly bound unto the above named HOUSING AUTHORITY, hereinafter called LMHA, for the use of LMHA and for all persons performing work or furnishing materials under, or for the purpose of, the contract described above, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firm by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas, the Principal entered into a certain contract with LMHA, identified as shown above and hereto attached:

NOW THEREFORE, if the Principal shall promptly make payment to all persons 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 modifications of 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 on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(To be executed in three original counterparts.)

CONTRACTOR

Witness: _____

Principal: _____
(Corporate, Proprietorship, or Partnership Name)

By: _____
(Signature of Principal's Owner, Partner, President or Vice-Pres., only)

Title: _____
Attest (For Corporations):

By: _____ **AFFIX CORPORATE SEAL**
(Corporate Sec. or Asst., Only)

Title: _____

SURETY

Surety Company:_____

Witness: _____ By: _____
(Attorney in Fact)

Countersigned:

By: _____ **AFFIX CORPORATE SEAL OF SURETY**
(Kentucky Licensed Resident Agent)

Name and Address of Surety Agency:

_____

Surety Company Name and Kentucky Regional or Branch Office Address:

_____

The rate of premium on this bond is $_____ per Thousand.

The total amount of premium charged is $_____

(To be executed in <u>three original</u> counterparts.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am the _____
(Printed name of Officer) (title of officer)

of the Firm named as Principal within bond; that _____
(Owner, Partner, Etc.)

who signed the said bond on behalf of the Principal was then _____
_____ (Title of Owner, Partner, etc.)

of said Firm; that I know his or her signature, and his/her signature thereto is genuine; and

that said bond was duly signed, sealed, and attested to for and in behalf of said Corporation

by authority of its governing body.

BY: _____
(Signature of Officer)

TITLE: _____

AFFIX CORPORATE SEAL

Instructions: "Officer" means any authorized officer of the Principal (Contractor), except the person who signed the bond (preceding page) as "Owner, Partner, etc." on behalf of the Principal.

(To be executed in three original counterparts.)

END OF SECTION G

SECTION H

FORM OF PERFORMANCE BOND

FORM OF PERFORMANCE BOND

If desired, other forms may be attached, but this form must be properly completed and shall prevail.

DATE OF EXECUTION: _____

NAME OF PRINCIPAL: _____
(CONTRACTOR)

NAME OF SURETY: _____

NAME OF OWNER: Louisville Metro Housing Authority

AMOUNT OF BOND (100% of Contract Price): _____

HOLLY PARK RENOVATIONS AND SITE DRAINAGE WORK – 2714 HOLLY PARK DR.
PROPOSAL No. 1588

KNOW ALL MEN BY THESE PRESENTS, that we the PRINCIPAL AND SURETY above named, are held and firmly bound unto the above named HOUSING AUTHORITY, hereinafter called LMHA, in the penal sum of the amount stated above for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, and successors, jointly and severally, firm by these presents.

THE CONDITIONS OF THIS OBLIGATION ARE SUCH, that whereas, the Principal entered into a certain contract with LMHA, identified as shown above and hereto attached:

NOW THEREFORE, if the Principal shall well and truly perform and fulfill all the undertaking, covenants, terms, conditions, and agreements of said Contract and any extensions thereof that may be granted by LMHA, with or without notice to the Surety, and during the life of any guaranty required under the Contract, and shall also well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of any and all duly authorized modifications of said Contract that may hereafter be made, notice of which modifications of 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 on the date indicated above, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

(To be executed in three original counterparts.)

CONTRACTOR

Witness: _____

Principal: _____
(Corporate, Proprietorship, or Partnership Name)

By: _____
(Signature of Principal's Owner, Partner, President or Vice-Pres., only)

Title: _____

Attest (For Corporations):

By: _____ **AFFIX CORPORATE SEAL**
(Corporate Sec. or Asst., Only)

Title: _____

SURETY

Surety Company: _____

Witness: _____ By: _____
(Attorney in Fact)

Countersigned:

By: _____ **AFFIX CORPORATE SEAL OF SURETY**
(Kentucky Licensed Resident Agent)

Name and Address of Surety Agency:

_____

Surety Company Name and Kentucky Regional or Branch Office Address:

_____

The rate of premium on this bond is $_____ per Thousand.

The total amount of premium charged is $_____.

(To be executed in <u>three original</u> counterparts.)

CERTIFICATE AS TO CORPORATE PRINCIPAL

I, _____, certify that I am
(Printed name of Officer)

the _____, of the Firm named as Principal
(Title of Officer)

within bond; that _____, who signed the said
(Owner, Partner, etc.)

bond on behalf of the Principal was then _____
(Title of Owner, Partner, etc.)

of said Firm; that I know his or her signature, and his/her signature thereto is genuine; and that said bond was duly signed, sealed, and attested to for and in behalf of said Corporation by authority of its governing body.

BY: _____
(Signature of Officer)

AFFIX CORPORATE SEAL

TITLE: _____

Instructions: "Officer" means any authorized officer of the Principal (Contractor), except the person who signed the bond (preceding page) as "Owner, Partner, etc." on behalf of the Principal.

(To be executed in three original counterparts.)

END OF SECTION H

SECTION I

GENERAL CONDITIONS FOR CONSTRUCTION CONTRACTS – PUBLIC HOUSING PROGRAMS
(HUD Form – 5370)

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. 11/30/2023)

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 hour. This includes the time for collecting, reviewing, and reporting the data. The information requested is required to obtain a benefit. 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. There are no assurances of confidentiality. 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.

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

this contract within calendar days of the effective date of the contract, or within the time schedule established in the notice to proceed issued by the Contracting Officer.

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 PHA, periodic estimates showing the value of the work performed during each period based upon the approved

submitted not later than _____ 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.

(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 $ _____ Contracting Officer insert amount] 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 $ _____ [Contracting Officer insert amount]

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 $ _____ [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 Contractor.

(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.

SECTION J

SUPPLEMENTAL GENERAL CONDITIONS

Form HUD-5370, *General Conditions of the Contract for Construction*, is supplemented, amended, and modified by the provisions of this Section J. Additional supplements, amendments, and modifications are contained in Section M.

I. DEFINITIONS

A. The term "Contract", in Paragraph 1. (b) of the *General Conditions*, includes all items identified at Article 3 of Section F, *Form of Contract*.

B. The term "LMHA" shall have the same meaning as the other terms noted in Paragraph 1. (h) of the *General Conditions*.

II. CONTRACTOR'S RESPONSIBILITY FOR WORK

A. The 12% performance requirement of Paragraph 2. (b) also applies to any entity represented as a subcontractor.

B. As used in Paragraph 2. (h) of the *General Conditions*, the term "accepted" means written acceptance.

C. Paragraph 2. (i) is added to the *General Conditions*, as follows:

The following forms, and any others LMHA may require, shall be used by the Contractor and are available for review upon request:

- HUD Form 5282, Certificate from Contractor Appointing Officer or Employee to Supervise Payment of Employees
- HUD Form 5372, Construction Progress Schedule
- HUD Form 51000, Schedule of Amounts for Contract Payments
- HUD Form 51001, Periodic Estimate for Partial Payment (must be accompanied by LMHA Form 7001)
- HUD Form 51002, Schedule of Change Orders
- HUD Form 51003, Schedule of Materials Stored
- HUD Form 51004, Summary of Materials Stored
- WH Form 347, Payroll Reporting Form
- WH Form-348, Payroll Statement of Compliance (on back of WH-347)
- LMHA Form 7000, Request for Acceptance of a Subcontractor
- LMHA Form 7001, Certifications of Payments to Subcontractors and Suppliers
- LMHA Form 7002, Agreement to Store Materials Off-Site

D. The Contractor shall perform the work in full compliance with LMHA requirements stated at the pre-bid conference(s), the pre-construction conference(s), and in the contract documents, unless otherwise expressly required by LMHA.

III. ARCHITECT'S DUTIES, RESPONSIBILITIES, AND AUTHORITY

A. The following sentence is hereby deleted from Paragraph 3. (c)(1) of the *General Conditions* and is henceforth without force or effect:

"The Architect shall file a copy of the report with the Contractor's designated representative at the site."

B. Paragraph 3. (d) is added to the *General Conditions* as follows:

In the event that no project architect/engineer is appointed, or the architect/engineer has contracted for limited services, the Contracting Officer, the Contracting Officer's Designee, or another person appointed by LMHA shall perform the necessary services under this paragraph.

C. For purposes of this Contract, day-to-day construction administration shall be performed by LMHA's Program M
manager.

IV. NOTICE TO PROCEED

A. Paragraph 5. (b) of the *General Conditions* is replaced with the following:

The Contractor shall begin work on the date designated in the duly executed Notice to Proceed, bearing the original signature of the Contracting Officer's Designee and the Contractor. Work will not commence prior to receipt of such notice.

V. CONSTRUCTION PROGRESS SCHEDULE

A. The following provisions are added to Paragraph 6. (a) of the *General Conditions*:

For projects expected to require more than five working days to complete, the Contractor, shall use a calendar schedule, with separate divisions for each major operation, activity, or category of work. Such schedules shall sequentially indicate the first and last day of work for each operation, activity, or category of work, as well as overall start and finish dates. The Contractor shall supplement the schedule with sub-schedules for each major operation, activity, or category of work. The Contractor shall schedule work so as to minimize adverse impact on the lives and activities of LMHA residents and employees and the quiet enjoyment of LMHA premises. The schedule shall include a reasonable time allocation for LMHA to conduct punch list and final inspections. No schedule shall be effective as against LMHA until such time as LMHA expressly approves it in writing.

If the Contractor fails to provide a fully acceptable schedule within the allotted time, LMHA may allow work to begin prior to receipt of a fully acceptable schedule. Such special consideration by LMHA shall not be construed as acceptance of any less-than-fully-acceptable schedule or schedules. Neither shall such action be the basis for, or any element of, any claim against LMHA or any LMHA officer, agent, or employee; nor shall it relieve the Contractor of the duty to provide a fully acceptable schedule in a timely fashion.

If LMHA permits the Contractor to begin work prior to LMHA's receipt of a fully acceptable schedule, LMHA may rescind, modify, or otherwise remedy such permission at any time LMHA deems such action appropriate. LMHA's remedies may include termination of the Contractor's right to proceed with part or all of the work. The Contractor shall have no claim, cause of action, remedy, or defense in connection with such actions by LMHA.

On the first working day of each month (or as LMHA otherwise directs) the Contractor shall submit an updated schedule showing any and all deviations from the originally approved schedule (or interim, less-than-fully-acceptable schedule). Each updated schedule shall indicate the total accumulated percentage of completion for each major operation, activity, or category of work. Updated schedules are for monitoring purposes and, unless expressly stated in writing by LMHA, shall not constitute an approved schedule revision or change of contract time for completion or basis for any claim by the Contractor.

B. The following provisions are added to Paragraph 6. (b) of the *General Conditions*: Should any such action become necessary, the Contractor shall bear any increased cost to LMHA for architects', engineers', environmental monitoring consultants', or others' services needed in conjunction with the work. The Contractor shall within 30 days of receiving LMHA invoices for such increased costs remit payment to LMHA. If the Contractor fails to remit payment within 30 days LMHA shall deduct the amount of the unpaid invoice(s) from remaining payments to the Contractor.

C. Paragraph 6. (d) is added to the *General Conditions* as follows:

The Contractor's schedule, and any updated schedules, whether or not approved by the LMHA, shall not be construed by the Contractor as grounds for determining the date for completion for the purposes of assessing liquidated damages or delay damages. Liquidated and delay damages may only be assessed in relation to the time for completion indicated in Section L, *Special Conditions*, and the date for completion calculated there from and set forth in the Notice to Proceed, except as expressly modified by any change order.

D. Paragraph 6. (e) is added to the *General Conditions* as follows:

Paragraph 6.(d), above, notwithstanding, if the Contractor gives the LMHA certain assurances (including construction progress schedules) that a specific portion of the contract work will be completed on a specific date, and the LMHA plans relocation or use activities based on such assurances, and the Contractor should fails to complete said portion of the contract work on the specified date, and has not provided a minimum of thirty (30) days written notice to LMHA that completion will not occur on the specified date, then the Contractor shall be held liable for any costs incurred by LMHA as a result of that portion of the contract work not being completed on the specified date.

E. Paragraph 6. (f) is added to the *General Conditions* as follows:

Paragraph 6.(d), above, notwithstanding, where the Contractor gives LMHA assurances (including construction progress schedules) that some portion(s) of the contract work will be

completed on a particular date or as indicated by the construction progress schedule, and LMHA plans for, solicits, or awards a contract for professional services in connection with activities under this contract, based on such assurances or schedule, and the Contractor should fails to complete said portion(s) of the contract work in accordance with said assurances or schedule, then the Contractor shall be liable for any increased cost to LMHA of securing or enjoying such professional services as a result of that failure.

VI. DIFFERING SITE CONDITIONS

A. Paragraph 8. (b)(1) is added to the *General Conditions* as follows:

LMHA will investigate the site conditions within 30 working days of receipt of written notice from the Contractor. Unless the site conditions materially differ from those indicated in this contract and are of a nature that requires stoppage of all work pending resolution, no adjustment of the contract time and/or price will be made for the time attributable to LMHA's investigation, direction, and processing in connection with the conditions.

VII. SPECIFICATIONS AND DRAWINGS FOR CONSTRUCTION

A. The following provisions are added to Paragraph 9. (a) of the *General Conditions*:

The Contractor shall maintain, in readable condition, at the project site or office, a complete set of approved project drawings, specifications, change orders, shop drawings, and submittals. All such items shall be readily available for review by LMHA or its representatives.

B. The following provisions are added to Paragraph 9. (c) of the *General Conditions*:

The terms "provide", "furnish", "furnish and install", and similar terms shall be interpreted to mean:

> The Contractor -- without LMHA’s participation or assistance, unless specifically promised in writing -- shall furnish and install the several components of the project work, complete, in place, and 100% ready for activation and use.

C. The following provisions are added to Paragraph 9. (f) of the *General Conditions*:

If shop drawings or other submittals show variance from the Contract Documents, and the Contractor fails to bring such variance to LMHA’s attention, in writing, at the time of submittal, and LMHA, having failed to recognize such variance, approves such submittal, LMHA may, upon subsequent discovery of said variance, rescind approval and require the Contractor to remove any work performed under the previously approved submittal and replace that work in a manner complying with the requirements of the Contract Documents at no additional cost to LMHA and with no adjustment of the contract time.

D. Paragraph 9. (j) is added to the *General Conditions* as follows:

All documents submitted to LMHA shall be delivered in a neat and easily interpreted format and shall be accompanied by a transmittal cover letter identifying the items being submitted and stating the action requested of LMHA with respect to such items.

E. Paragraph 9. (k) is added to the *General Conditions* as follows:

The Contractor, by signing this contract, certifies that 1) the Contractor has thoroughly reviewed the contract documents, 2) the Contractor had the opportunity to attend at least one pre-bid conference, 3) the Contractor, prior to the bid opening, had sufficient opportunity to raise any and all questions regarding any perceived ambiguity, conflict, error, omission, irregularity, or defect of the contract documents or raised by other LMHA representations, 4) the Contractor, prior to the bid opening, addressed to LMHA any and all such questions that the Contractor may have had, 5) the Contractor would not have submitted a bid for this contract had LMHA not satisfactorily answered the Contractor's questions prior to the bid opening, 6) the Contractor waives any and all right to challenge LMHA's pre-bid responses to such questions in the future, 7) the Contractor understands and agrees that contract interpretation is solely LMHA's right and that where the Contractor's view of contract requirements differs from LMHA's, LMHA's view shall govern and the Contractor shall proceed with the work as directed by LMHA without change or adjustment of the contract time, price, or conditions, and 8) the Contractor waives any and all right to challenge LMHA's interpretation of the contract documents or other LMHA representations or to pursue any remedy of any kind related to such interpretation.

VIII. MATERIAL AND WORKMANSHIP

A. Paragraph 11. (a)(1) is added to the *General Conditions* as follows:
Wherever the words "or equal", or words of similar meaning, appear in the Contract Documents, they shall be interpreted to mean an item, material, equipment, article, product, method, or process equal in quality to that named and suitable to the same use and capable of performing the same function as that named with equivalent efficiency, as determined by LMHA based on salient features and intended purpose.

B. Paragraph 11. (a)(2) is added to the *General Conditions* as follows:

Proof of equality is not implied by the Contract Documents and is not LMHA's burden. The burden of proof of equality shall be upon the Contractor. LMHA shall weigh the evidence of equality with fairness to all parties. Inclusion of a brand name, or type of item, material, equipment, article, product, method, or process in the Contractor's bid shall not obligate LMHA to accept such item, material, equipment, article, product, method, or process, if, in LMHA's opinion, that item, material, equipment, article, product, method, or process does not meet the requirements of the Contract Documents and its acceptance is not in LMHA's best interest. LMHA's determination regarding equality shall be final.

C. The following provisions are added to Paragraph 11. (b)(2) of the *General Conditions*:

1. All documents submitted to LMHA shall be transmitted in a neat and easily interpreted format and shall be accompanied by a transmittal cover letter stating the action requested of LMHA with respect to such items.

2. If any submittal shows variance from the Contract Documents, and the Contractor fails to bring such variance to LMHA's attention, in writing at the time of submittal, and LMHA, having failed to recognize such variance, approves such submittal, LMHA may, upon subsequent discovery of said variance, rescind approval and require the Contractor to remove any work performed under the previously approved submittal and replace that work in a manner complying with the requirements of the Contract Documents at no additional cost to LMHA and with no adjustment of the contract time.

D. Paragraph 11. (b)(6) of the *General Conditions* is replaced with the following:

All samples shall become the property of LMHA and shall be retained by LMHA until such time as LMHA sees fit to dispose of them. LMHA may dispose of samples in any way it sees fit, with no liability to the Contractor.

E. Paragraph 11. (b)(7) is added to the *General Conditions* as follows:

In the event the specifications indicate that either of two or more materials, equipment, articles, products, or processes is acceptable, the Contractor shall propose one of those items and shall indicate the basis for that item's selection. The process of submittal and approval for such items shall be the same as that prescribed for other items elsewhere in these documents. LMHA shall evaluate the item to determine if approval is in LMHA's best interest. If LMHA does not approve the submittal, the Contractor shall submit an alternate for LMHA's consideration. LMHA's decision regarding <u>any</u> submittal shall be final and shall not be the basis for any increase in the contract price or time, provided the item finally approved by LMHA was among, or comparable to, those included in the listed options. The Contractor shall maintain a legible copy of each approved submittal at the project site for the use of LMHA and LMHA's representatives.

IX. HEALTH, SAFETY, AND ACCIDENT PREVENTION

A. Paragraph 13. (d)(1) is added to the *General Conditions* as follows:

Paragraph 13. (d), above, notwithstanding, LMHA's failure to identify any incident of, or potential for, non-compliance with these requirements shall not relieve the Contractor of the duty to maintain current knowledge of, and compliance with, all such requirements, whether existing at the time of contract award or implemented thereafter.

B. Paragraph 13. (D)(2) is added to the *General Conditions*, as follows:
The Contractor is hereby notified of the existence of, and requirement to comply with, 29 CFR 1926.62, OSHA's standard on lead exposure in the construction industry.

X. INSPECTION AND ACCEPTANCE OF CONSTRUCTION

A. The following provisions are added to Paragraph 20 of the *General Conditions*:

The terms "acceptance", "instructions", and "approvals", as used in Paragraph 20. (a)(1), 20. (d), and 20. (j) of the *General Conditions*, means <u>written</u> acceptance, instructions, and approvals.

As used in this instrument, the term "final completion" means that the work designated by LMHA is–in LMHA's sole discretion—complete to allow LMHA to take full possession of it and use it for its intended purpose.

B. The following provisions are added to Paragraph 20. (j) of the *General Conditions*:

Such acceptance may be affected by the necessity of HUD inspections, reviews, etc. Should HUD become involved, any time required for HUD to complete its activities shall not be counted against the Contractor or against LMHA for the purposes of assessing liquidated damages or delay damages or for any other modification of the contract amount or time.

C. Paragraph 20. (k) is added to the *General Conditions* as follows:

LMHA's Program Manager and the Construction Manager will at all times have access to the work to observe the progress and quality wherever it is in preparation of progress, and the Contractor will provide proper facilities for such access and for necessary inspection and testing at the Contractor's expense.

D. Paragraph 20. (l) is added to the *General Conditions* as follows:

As part of achieving final completion, the Contractor shall organize and submit four (4) copies of any operating, service, maintenance, and installation manuals for each item of manufactured equipment or system supplied and installed under this contract. Data required shall include, but is not necessarily limited to, manufacturer's data and cut sheets, installation instructions and notes, start-up procedures, servicing and maintenance manuals and instructions, and any related data including parts lists and "as-built drawings." The Contractor shall also submit all related warranty documents and shall provide assurance that all warranties have been assigned to LMHA.

XI. WARRANTY OF CONSTRUCTION

A. The following provisions are added to Paragraph 23. (a) of the *General Conditions*:

The Contractor shall immediately and at no cost to LMHA, provide qualified service personnel, regardless of the time of day or night, to correct warranty related deficiencies, which may cause personal injury or damage to other components.

B. Paragraph 23 (k) is added to the *General Conditions* as follows:
Approximately eleven (11) months after final acceptance of the project, but in any case, prior to expiration of the warranty period, LMHA shall conduct a warranty inspection to identify items requiring repair or replacement. The Project Architect, if any, may participate in said inspection. The Contractor may also join in the inspection, if so desired, provided such participation is in the best interests of LMHA and LMHA residents. LMHA or the Project Architect shall then prepare a list of warranty items requiring correction and present said list to the Contractor for appropriate action. The Contractor shall coordinate and effect all necessary repairs, replacements, etc., including any incidental costs associated with such work, at no expense to LMHA and within 30 days of receipt of the list of warranty items. If the project was

finally accepted by LMHA in several parts, warranty inspections and lists shall follow the timeline established by such acceptance.

XII. CONTRACT PERIOD

A. Paragraph 25 of the *General Conditions* is replaced with the following:

The Contractor shall complete all work required under this Contract within the time specified in Section L, *Special Conditions*, of the Contract, and on, or before, the date for completion set forth in the Notice to Proceed, and as modified by any approved change orders.

XIII. PAYMENTS

A. Paragraph 27. (c)(1) is added to the *General Conditions* as follows:

The above referenced breakdown shall be submitted on Form HUD-51000, *Schedule of Amounts for Contract Payments*, unless an alternate format has been approved, in writing, by LMHA. If Unit Prices are for any reason not included in the bid documents, LMHA may, at its discretion, rely upon this breakdown as a guide for determining additions to, or deductions from, the contract price.

B. The following provisions are added to Paragraph 27. (e) of the *General Conditions*:

The form of this certification will be provided by LMHA and shall be used by the Contractor. The Contractor shall complete, sign, and attach this certification form when submitting Form HUD-51001, *Periodic Estimate for Partial Payment*.

Insert the word "Timely" at the beginning of the second clause of the form so it begins, "Timely payments to subcontractors and suppliers have been made from previous payments ... "

C. Paragraph 27. (f) of the General *Conditions* shall be replaced as follows:

The PHA shall retain ten (10) percent of the amount of progress payments until completion and acceptance of all work under the contract.

D. Paragraph 27. (l) is added to the *General Conditions* as follows:
Ten-Day Payment, Subcontractors -- The Contractor shall, within ten (10) consecutive calendar days after receiving payment from LMHA, pay all subcontractors for the work, or material, or both, for which the Contractor received payment from LMHA. The Contractor shall pay each subcontractor the full amount LMHA paid the Contractor with respect to the particular subcontractor, except that the Contractor may withhold retainage from subcontractors in the same percentage as LMHA withholds retainage from the Contractor. The Contractor's failure to perform this obligation is ground for LMHA to withhold, from future payments to the Contractor, any and all sums not paid to subcontractors. LMHA may not withhold funds if the Contractor submits an affidavit averring that a genuine dispute exists between the Contractor and the unpaid, or underpaid, subcontractor. LMHA may ignore such an affidavit, and may take such other action as LMHA may deem appropriate or necessary, where the Contractor has previously delivered to LMHA a payment request that included the amount allegedly in dispute

between the Contractor and the subcontractor. LMHA reserves the right, without obligation, to place sums withheld under this provision in an interest-bearing escrow account or to pay such sums directly to subcontractors.

XIV. CONTRACT MODIFICATIONS

A. The following provisions are added to Paragraph 28. (c) of the *General Conditions*:

Time required for HUD or LMHA processing of proposed modifications shall not--under any circumstances--be construed as a delay on the part of LMHA. Nor shall the Contractor be entitled to additional payment for overhead, direct costs, impact costs, lost profit, etc., in connection with such review or processing time, either as a part of that modification or as a part of any other modification (s).

XV. CHANGES

A. Paragraph 29. (b) of the *General Conditions* is replaced with the following language:

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 (1) the Contractor gives the Contracting Officer written notice stating (a) the date, circumstances and source of the order and (b) that the Contractor regards the order as a change order and (2) in LMHA's sole opinion there has, in fact, been a material change. In the event of ambiguity, real or alleged, in the contract documents, it is for LMHA, not the Contractor, to determine the proper meaning and intent of the documents. Where the contract documents conceivably comprehend more than one method or means of accomplishing the work and the Contractor did not, before submitting its bid, expressly state the method or means it intended to use the Contractor shall use the method or means LMHA prescribes. Where the Contractor fails to expressly raise such issues prior to bidding the work the Contractor shall perform as LMHA directs, regardless of what the Contractor may have construed the documents as meaning, without any adjustment of time, price, or other conditions.

B. The following provisions are added to Paragraph 29. (d) of the *General Conditions*:

The Contractor's mere assertion that a change has occurred, that the Contractor's costs are increased because of some LMHA action, or that the specifications are defective is not sufficient ground for a change or an equitable adjustment. The Contractor bears a heavy burden of proof and LMHA, alone, shall determine whether the Contractor has carried that burden sufficiently to merit a change and equitable adjustment.

C. The following provisions are added to Paragraph 29. (g) of the *General Conditions*: Such information shall, at the very least, demonstrate all ways in which the project's critical path may be delayed and why such delay cannot be avoided or mitigated by rescheduling or resequencing work activities. Such information is required both for compensable and non-compensable time extension requests. These provisions shall not be construed as conflicting with, nullifying, or in any way limiting or abrogating the prohibitions set forth in Items XIII and XIV, above, regarding review time.

XVI. DISPUTES

A. The following Paragraph 31. (e)(1) is added to the *General Conditions*:

Under no circumstances shall LMHA be compelled to submit to arbitration, mediation, or other form of alternative dispute resolution (ADR), except by LMHA's express written consent. Under no circumstances shall any arbitration, mediation, or other form of ADR (Alternate Dispute Resolution) to which LMHA may submit be binding upon LMHA, except by LMHA's prior express written consent.

B. The following Paragraph 31. (e)(2) is added to the *General Conditions*:

The Contractor shall not resort to legal action in any court unless and until the Contractor has actually exhausted all administrative remedies.

XVII. LIQUIDATED DAMAGES

A. Paragraph 33. (a) of the *General Conditions* notwithstanding, the terms of Liquidated Damages are stated at Section F, *Form of Contract,* of the Contract.

XVIII. TERMINATION FOR CONVENIENCE

A. The time set forth in Paragraph 34. (c) of the *General Conditions* shall be sixty (60) days, but may be longer if deemed necessary by LMHA.

XIX. INSURANCE

A. Paragraph 36. (a)(2) of the *General Conditions* is amended as follows:

Commercial General Liability combined single limit for bodily injury and property damage shall be not less than $1,000,000.00 per occurrence.

B. Paragraph 36. (a)(3) of the *General Conditions* is amended as follows:

Automobile Liability combined single limit for bodily injury and property damage shall be not less than $1,000,000.00 per occurrence. Automobile Insurance Certificate shall include a 1980 Motor Carrier Act endorsement for contracts involving the transportation of hazardous waste.

C. The following sentence(s) shall be added to Paragraph 36. (b) of the *General Conditions*:

The Contractor shall be fully responsible for protection, maintenance, and insurance of the property against theft, vandalism, accidental mishaps, natural disasters, and any other harm during the construction period.

The builder's risk policy shall be in form and substance acceptable to LMHA and shall include (i) a soft cost endorsement in the amount of $300,000 and (ii) a debris removal sublimit no less than 50% of the amount paid for the direct loss.

D. Paragraphs 36. (d), (e), and (f) are added to the *General Conditions* as follows:

(d) For contracts involving lead-based paint or asbestos abatement the Contractor and affected subcontractors shall maintain appropriate liability insurance expressly providing coverage for those activities. The minimum limit of coverage shall be $1,000,000.00 per occurrence. "Claims-Made" policies are unacceptable for lead-based paint or asbestos activities.

(e) **Under no circumstances shall any contractor or subcontractor perform work on LMHA property prior to LMHA's acknowledgment of receipt of proper and satisfactory proof of such party's insurance as specified herein.** Likewise, any contractor or subcontractor whose insurance certificate has expired shall immediately cease work on LMHA property until such time as LMHA acknowledges receipt of a current, acceptable certificate. It is the Contractor's responsibility to ensure that all insurance certificates are kept up-to-date.

(f) Insurance Certificates shall:

- Identify the project site; and,
- Indicate the Contract Number; and,
- Include LMHA as an additionally insured; and,
- Include the following language, verbatim, with regard to cancellation:

  None of the above described policies shall be canceled or non-renewed without at least thirty (30) days prior written notice from the issuing company to the Additional Insured named at left.
  and,

- Bear the original signature of the Carrier's authorized representative.

XX. SUBCONTRACTS

A. The following provisions are added to Paragraph 37. (a)(1) of the *General Conditions*: Employment of an individual or entity to perform work for a set amount of payment per unit of work or on a "per job" basis, is strictly prohibited where such arrangement results in the individual or any individual employed by the entity receiving less than the applicable Davis-Bacon hourly wage (including fringe benefits). Any doubt as to such issues shall be resolved against the Contractor and LMHA shall act against the Contractor as LMHA deems appropriate to resolve the matter and the Contractor shall have no recourse against LMHA for any action taken in the matter.

Second and Third tier subcontracting is not strictly prohibited, but is strongly discouraged and subject to approval by the LMHA. Third tier subcontractors must submit for LMHA's consideration all the same documents as subcontractors.

B. Paragraph 37. (a)(2)(i) is added to the *General Conditions* as follows:

To maintain high standards of quality and craftsmanship in materials and services and to facilitate expedient completion of the work, suppliers, vendors, and firms must demonstrate that

they have been established and operating successfully in the area of expertise in which they propose to participate may work on this project. For example, a firm that normally erects or supplies masonry, but proposes to furnish or install windows on this project, would not qualify as a window subcontractor (i.e., supplier, vendor, or firm).

The Contractor shall submit evidence, suitable to LMHA, of any subcontractor's qualifications whenever LMHA requests such evidence, whether before or after LMHA's acceptance of such subcontractor. In the event LMHA approves a subcontractor and later determines the subcontractor is not suitable the Contractor shall, upon LMHA's demand, dismiss the subcontractor and propose a suitable replacement for LMHA's consideration. No adjustment increasing the contract time or price shall flow from such action by LMHA.

C. Paragraph 37. (b)(1) is added to the *General Conditions* as follows:
Contractor's may consult the ***System for Award Management*** (SAM) (formerly known as the U.S. General Services Administration's *Excluded Parties List* - EPL) using the following link: https://sam.gov/SAM/pages/public/searchRecords/searchResults.jsf to determine subcontractor eligibility.

D. Paragraph 37. (f) is added to the *General Conditions* as follows:

The Contractor shall not enter into any subcontract agreement prior to receipt of LMHA's written acceptance of the proposed subcontractor. The Contractor shall not instruct or permit anyone to perform work on this project without LMHA's express written consent. LMHA shall make no payment for work performed by any subcontractor whom LMHA has not accepted in writing, or whom LMHA has subsequently determined is unacceptable. Failure to comply with these requirements is grounds for LMHA to order work stoppage, termination of the Contractor's right to proceed, or any other action LMHA deems necessary to ensure compliance.

E. Paragraph 37. (g) is added to the *General Conditions* as follows:
Only one subcontractor may be employed at any time for each category of work. Multiple subcontractors for the same category of work will not be considered unless each of those subcontractors appeared on the *List of Proposed Subcontractors* in the bid documents. If at any time the Contractor wishes to employ multiple subcontractors in the same category of work, all of the proposed subcontractors for that category of work must be submitted simultaneously for LMHA's consideration.

LMHA may approve the use of multiple subcontractors in a single category of work, if the contractor produces evidence, satisfactory to LMHA, that use of a single subcontractor would be less cost-effective, less efficient, or is not feasible. Such approval will be based solely on the best interests of LMHA.

F. Paragraph 37. (h) is added to the *General Conditions* as follows:

The Contractor shall require all subcontractors proposed to participate in this project to complete and sign a form certifying that the subcontractor is familiar with the requirements of

the contract between the Contractor and LMHA and agrees to be bound by those requirements insofar as they apply to said subcontractor (forms will be provided at the pre-construction meeting).

G. Paragraph 37. (i) is added to the *General Conditions* as follows:

If the general contractor is authorized to substitute subcontractors (including 3rd tier subcontractors) and a cost saving to the general contractor is realized, 50% of the saving shall be credited to the Louisville Metro Housing Authority.

XXI. LABOR STANDARDS, DAVIS-BACON AND RELATED ACTS

A. Paragraph 46. (a)(2)(V) is added to the *General Conditions* as follows:

The General Wage Decision applicable to this project, and required by the Federal Davis-Bacon Act, is included in these documents at Section K.

B. The following provisions are added to Paragraph 46. (c)(2)(i) of the *General Conditions*:

All payrolls shall be submitted on Form WH-347. No other form may be used without LMHA's prior written consent. If granted, LMHA may at any time rescind such consent should the alternative form prove less than satisfactory for LMHA's purposes.

C. The following provisions are added to Paragraph 46. (c)(2)(i) of the *General Conditions*:

Payrolls shall be submitted no later than five working days after the last day of that payroll period to which they pertain.

D. Paragraph 46. (l) is added to the *General Conditions* as follows:

LMHA shall notify the Contractor, in writing, of labor standards discrepancies as they become known. Should any discrepancy remain unresolved thirty (30) consecutive calendar days after notification from LMHA, LMHA shall begin recording time expended by LMHA employees in pursuit of resolving such discrepancy. For each such hour, or portion of an hour, the sum of $30.00 shall be set-off from remaining payments to the Contractor as compensation for such costs. Such charges shall continue accruing until the discrepancy is satisfactorily resolved.

END OF SECTION J

SECTION K

FEDERAL DAVIS-BACON GENERAL WAGE DECISION

General Decision Number: KY20230012 01/06/2023

uperseded General Decision Number: KY20220012

tate: Kentucky

onstruction Type: Residential

ounties: Bullitt, Henry, Jefferson, Meade, Nelson, Oldham, helby, Spencer and Trimble Counties in Kentucky.

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

ote: Contracts subject to the Davis-Bacon Act are generally equired to pay at least the applicable minimum wage rate equired under Executive Order 14026 or Executive Order 13658. lease note that these Executive Orders apply to covered ontracts entered into by the federal government that are ubject to the Davis-Bacon Act itself, but do not apply to ontracts subject only to the Davis-Bacon Related Acts, ncluding those set forth at 29 CFR 5.1(a)(2)-(60).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	. Executive Order 14026 generally applies to the contract. . The contractor must pay all covered workers at least $16.20 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 2023.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	. Executive Order 13658 generally applies to the contract. . The contractor must pay all covered workers at least $12.15 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2023.

he applicable Executive Order minimum wage rate will be djusted annually. If this contract is covered by one of the xecutive Orders and a classification considered necessary for erformance of work on the contract does not appear on this age determination, the contractor must still submit a onformance request.

dditional information on contractor requirements and worker rotections under the Executive Orders is available at ttp://www.dol.gov/whd/govcontracts.

odification Number	Publication Date
0	01/06/2023

CARP0064-005 06/01/2022

	Rates	Fringes

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ARPENTER
Form work only.....$ 28.23 20.89

ENGI0181-032 06/01/2021

	Rates	Fringes
OWER EQUIPMENT OPERATOR: Crane (All other types), truck crane, tower cranes (French, German and other types).....	$ 33.90	17.85

CRANE WITH BOOM 150 FEET & OVER, INCLUDING JIB SHALL RECEIVE $.75 ABOVE RATE

ALL CRANES WITH PILING LEADS WILL RECEIVE $.50 ABOVE RATE REGARDLESS OF BOOM LENGTH

PLAS0692-012 04/01/2021

	Rates	Fringes
EMENT MASON/CONCRETE FINISHER...	$ 27.80	18.71

PLUM0502-006 08/01/2022

	Rates	Fringes
LUMBER.....	$ 38.22	23.93

SHEE0110-014 06/01/2021

	Rates	Fringes
HEET METAL WORKER (Including utter installer).....	$ 33.74	23.31

SUKY2010-046 07/21/2010

	Rates	Fringes
RICKLAYER.....	$ 16.00 **	0.00
ARPENTER.....	$ 13.00 **	0.25
LECTRICIAN.....	$ 14.25 **	1.70
ABORER: Common or General.....	$ 11.10 **	1.08
ABORER: Grade Checker.....	$ 14.00 **	1.57
ABORER: Mason Tender - ement/Concrete.....	$ 12.10 **	0.00
PERATOR: Backhoe.....	$ 21.50	1.79
PERATOR: Bulldozer.....	$ 21.50	1.79
PERATOR: Roller.....	$ 20.41	5.72
AINTER: Brush and Roller.....	$ 10.00 **	0.00
OOFER: Shake & Shingle Roof....	$ 14.28 **	0.00
RUCK DRIVER: Dump Truck.....	$ 14.00 **	1.63

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peration to which welding is incidental.

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* Workers in this classification may be entitled to a higher inimum wage under Executive Order 14026 ($16.20) or 13658 $12.15). Please see the Note at the top of the wage etermination for more information.

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

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

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he body of each wage determination lists the classification nd wage rates that have been found to be prevailing for the ited type(s) of construction in the area covered by the wage etermination. The classifications are listed in alphabetical rder of ""identifiers"" that indicate whether the particular ate is a union rate (current union negotiated rate for local), survey rate (weighted average rate) or a union average rate weighted union average rate).

nion Rate Identifiers

four letter classification abbreviation identifier enclosed n dotted lines beginning with characters other than ""SU"" or "UAVG"" denotes that the union classification and rate were revailing for that classification in the survey. Example: LUM0198-005 07/01/2014. PLUM is an abbreviation identifier of he union which prevailed in the survey for this lassification, which in this example would be Plumbers. 0198 ndicates the local union number or district council number here applicable, i.e., Plumbers Local 0198. The next number, 05 in the example, is an internal number used in processing he wage determination. 07/01/2014 is the effective date of the ost current negotiated rate, which in this example is July 1, 014.

nion prevailing wage rates are updated to reflect all rate hanges in the collective bargaining agreement (CBA) governing his classification and rate.

urvey Rate Identifiers

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he published rate is derived by computing a weighted average ate based on all the rates reported in the survey for that lassification. As this weighted average rate includes all ates reported in the survey, it may include both union and on-union rates. Example: SULA2012-007 5/13/2014. SU indicates he rates are survey rates based on a weighted average alculation of rates and are not majority rates. LA indicates he State of Louisiana. 2012 is the year of survey on which hese classifications and rates are based. The next number, 007 n the example, is an internal number used in producing the age determination. 5/13/2014 indicates the survey completion ate for the classifications and rates under that identifier.

urvey wage rates are not updated and remain in effect until a ew survey is conducted.

nion Average Rate Identifiers

lassification(s) listed under the UAVG identifier indicate hat no single majority rate prevailed for those lassifications; however, 100% of the data reported for the lassifications was union data. EXAMPLE: UAVG-OH-0010 8/29/2014. UAVG indicates that the rate is a weighted union verage rate. OH indicates the state. The next number, 0010 in he example, is an internal number used in producing the wage etermination. 08/29/2014 indicates the survey completion date or the classifications and rates under that identifier.

UAVG rate will be updated once a year, usually in January of ach year, to reflect a weighted average of the current egotiated/CBA rate of the union locals from which the rate is ased.

WAGE DETERMINATION APPEALS PROCESS

.) Has there been an initial decision in the matter? This can e:

- an existing published wage determination
- a survey underlying a wage determination
- a Wage and Hour Division letter setting forth a position on
- a wage determination matter
- a conformance (additional classification and rate) ruling

n survey related matters, initial contact, including requests or summaries of surveys, should be with the Wage and Hour ational Office because National Office has responsibility for he Davis-Bacon survey program. If the response from this nitial contact is not satisfactory, then the process described n 2.) and 3.) should be followed.

ith regard to any other matter not yet ripe for the formal rocess described here, initial contact should be with the ranch of Construction Wage Determinations. Write to:

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

.) If the answer to the question in 1.) is yes, then an nterested party (those affected by the action) can request eview and reconsideration from the Wage and Hour Administrator

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

he request should be accompanied by a full statement of the
nterested party's position and by any information (wage
ayment data, project description, area practice material,
tc.) that the requestor considers relevant to the issue.

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

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

.) All decisions by the Administrative Review Board are final.

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END OF GENERAL DECISIO"

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SECTION L

SPECIAL CONDITIONS

1. ORDER OF WORK

A. **Under no circumstances shall any contractor or subcontractor perform work on LMHA property prior to LMHA's receipt of proper and satisfactory evidence of such party's insurance as specified elsewhere in the Contract.** Likewise, any contractor or subcontractor whose insurance certificate has expired shall immediately cease work on LMHA property until such time as a new and current certificate is received by LMHA. It is the Contractor's responsibility to ensure that all insurance certificates are kept up-to-date.

B. No work shall commence under the Contract unless and until all pre-work requirements have been met and all necessary materials and equipment are on-hand and ready to be installed complete, in-place, and ready for use, as specified in the Contract.

C. The Contractor shall give priority to completing work in the order directed by LMHA. Minimizing inconvenience to residents is a Contract priority. The Contractor shall make every feasible effort to schedule and prosecute the work in such manner as to minimize inconvenience to LMHA residents. The Contractor is forewarned, LMHA may change the work sequence at any time and may do so more than once. If, the Contractor demonstrates that such a change materially increases the cost of performance, LMHA may grant an equitable adjustment.

D. The Contractor shall prepare a calendar schedule of the entire project. The schedule shall ensure that the contract is completed on or before the stipulated date for completion. All work shall be planned and performed so as to minimize inconvenience to LMHA residents and employees. Where the contract requires work in an occupied area the Contractor shall take all necessary steps to ensure that all work in such dwelling is completed as quickly as reasonably possible. The calendar schedule shall.

- Ensure that the contract is completed within the allotted time for completion;
- Identify starting and completion dates for each element of work;
- Identify starting and completion dates for the total project.

2. TIME FOR COMPLETION

A. Work, including preparation and submittal of schedules and other required items, shall commence on the date stipulated in the duly executed Notice to Proceed. The Contract Period shall be **FIVE HUNDRED & FORTY (540) CALENDAR DAYS.**

B. The Contractor shall not perform, or permit, overtime or holiday work without the LMHA's prior written consent. The following days are observed holidays:

New Year Day - January 1
Martin Luther King, Jr. Day - Third Monday in January
Memorial Day - Last Monday in May
Juneteenth – June 19
Independence Day - July 4
Labor Day - First Monday in September

Thanksgiving Day - Fourth Thursday in November
Day after Thanksgiving Day - Fourth Friday in November
Christmas Day - December 25
Day after Christmas Day - December 26

C. NOTE: If holiday falls on a Saturday, it will be observed on the preceding Friday. If holiday falls on a Sunday, it will be observed on the following Monday.

D. The Contractor is hereby advised that LMHA administrative personnel may take vacation(s), or other leave, during the contract period. Every effort will be made to maintain smooth administration of the contract during such vacations, however, any effect such vacations may have on the administration of this contract shall not be construed by the Contractor as the basis for delay or damage claims.

E. The Contractor may perform work between the hours of 8:00 a.m. and 4:00 p.m., Monday through Friday, except as otherwise provided by the Contract or otherwise directed or permitted in writing by the LMHA.

3. MINIMUM DAILY ACTIVITY

A. General Construction: Time is of the essence. The Contractor shall provide all labor, materials, and equipment necessary to complete the work as quickly as reasonably possible. The Contractor shall exercise professional judgment to ensure provision of adequate resources to accomplish the work without unduly interfering with LMHA residents' use and enjoyment of their homes.

4. SITE CONDITIONS

A. The Contractor shall remove all debris from the site and clean all work areas at the end of each day of work. The Contractor shall keep the project site clean and free from debris at all times. If the Contractor is negligent or lax in discharging these responsibilities, the LMHA may furnish labor and equipment to perform the needed work and may deduct the cost of such work from the Contract Price.

B. The Contractor shall provide appropriately sized trash receptacles at the project site and shall ensure that they are promptly removed when full. The Contractor shall not dispose of trash in LMHA trash receptacles.

C. Workers shall use designated areas when eating lunch, taking breaks, etc., and shall properly dispose of all personal debris.

D. The Contractor is ultimately responsible for securing its work areas, equipment, and other interests.

6. PROJECT SITE

A. The project site is located in the City of Louisville, Kentucky, and is identified elsewhere in the Contract.

7. COMMUNICATIONS

A. The Contractor shall present all notices, demands, requests, proposals, instructions, approvals, and claims in writing. Regarding matters related to this project, the Contractor shall communicate only with LMHA's Program Manager, unless otherwise authorized in writing by LMHA's Contracting Officer.

B. Any notice to, or demand upon, the Contractor shall be sufficiently given if delivered at the Contractor's address indicated on the signature page of the *Form of Contract* (or at such other address as the Contractor may, from time to time, designate, in writing, to LMHA) or if deposited in the U.S. Mail in a postage prepaid envelope, or if delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

C. Unless otherwise stated in writing by the Contracting Officer, only the following individuals have the authority to order work under this contract on LMHA's behalf:

LMHA Employee	**Name**
Contracting Officer	Lisa Osanka
Director, Capital Improvements Department	Norma Ward
Program Manager, Capital Improvements Department	Michelle Chandler

D. **The Contractor performs work ordered by any other persons at its own risk**. LMHA will notify the Contractor if LMHA removes, replaces, or adds any LMHA agent during the contract period.

E. All deliveries to the Louisville Metro Housing Authority shall, unless otherwise specified in writing, be addressed to:

Michelle Chandler
Louisville Metro Housing Authority
420 South Eighth Street
Louisville, KY 40203

F. Any notice to, or demand upon, LMHA shall be sufficiently given if delivered at the address written above (or at such other address as LMHA may, from time to time, designate in writing) or if deposited in the U.S. Mail in a postage prepaid envelope, or if delivered with charges prepaid to any telegraph company for transmission, in each case addressed to such office.

G. Any communication shall be deemed to have been delivered at the time of receipt indicated by LMHA's time/date stamp or similar device. The preceding sentence notwithstanding, any communication received after 3:00 p.m., Monday through Friday, or on a holiday, shall be considered as having been received on the next business day.

8. JOB OFFICES/TEMPORARY STRUCTURES

A. A job site office is NOT REQUIRED.

B. The Contractor shall provide telephone, toilet, and other facilities for its use, as they deem necessary. Neither the Contractor nor subcontractors shall use LMHA facilities or equipment.

C. Upon completion of the contract work, or when directed by LMHA, the Contractor shall remove all such temporary structures and facilities from the project site and leave the premises in condition equal to, or better than, its condition at the time of contract award. The Contractor shall provide before and after photographs to substantiate its compliance with this requirement.

9. COOPERATION WITH THE LMHA AND LMHA RESIDENTS

A. Should any worker on this project become abusive or offensive to LMHA, LMHA employees, LMHA Residents, or the general public, the Contractor shall immediately remove the worker from the project.

B. Should any LMHA resident become a nuisance, by complaining about or interfering with the work, or by other acts, the Contractor shall immediately notify the LMHA so that steps may be taken to alleviate the problem. In the event the safety of the Contractor's personnel is imminently jeopardized by the action of a resident, or other person, the Contractor should first notify the appropriate authorities (i.e., Police, Fire Dept., etc.) and notify LMHA thereafter.

C. LMHA must notify residents 48 hours prior to performing any work that requires displacement of vehicles, closure of streets, disruption of public services, or interruption of heat, hot water, electricity, etc.

LMHA will provide personnel to deliver such notices and to accompany the Contractor's or subcontractors' personnel to occupied units where residents cannot be present during the work. The Contractor shall, to the maximum extent feasible, notify LMHA's Program Manager at least 96 hours in advance of each such activity so that LMHA may prepare and distribute notices.

10. MATERIALS STORAGE

A. Materials may be stored off-site in certain instances, provided LMHA and HUD requirements are satisfied, and the Contractor enters into an " Agreement to Store Materials Off-Site" (utilizing the LMHA Form 7002).

13. PROGRESS MEETINGS

A. With the express purpose of expediting the work and providing opportunities for cooperation of affected parties, representatives of the LMHA, the Contractor, and such others as LMHA may deem necessary shall attend progress meetings.

B. Others, including the Contractor, may suggest or request meetings, but LMHA, alone, shall determine whether, when, and where meetings are appropriate.

14. TEMPORARY UTILITIES

A. Utilities are not available. Contractor shall be responsible for utilities.

15. SANITARY FACILITIES

A. The Contractor shall furnish, install, and maintain ample sanitary facilities for workers employed on this project.

B. The Contractor shall furnish drinking water from an approved safe source, piped or transported so as to remain clean and fresh and served from single service containers or satisfactory types of sanitary drinking stands or fountains.

C. The Contractor shall maintain all sanitary facilities in strict accordance with all state and local health regulations and shall remove them from the project site upon completion or at LMHA's direction.

16. PROTECTION OF GROUNDS

A. As described elsewhere in the Contract Documents.

17. EXPLOSIVES

A. No explosives shall be used on this project.

18. PARKING

A. LMHA may designate some parking space for the Contractor's use. Designated parking, if any, may not be adequate for all project vehicles and is not guaranteed under the Contract. The Contractor must submit written requests for designated parking.

B. Whether or not LMHA provides designated parking space for the Contractor's use, the Contractor shall ensure that no vehicle owned by the Contractor, any subcontractor, any employee of the Contractor or

subcontractor(s), or any other party in the service of any of the above-named parties, is permitted to park in LMHA parking areas or on other portions of LMHA property without LMHA's written consent.

19. TEMPORARY PROTECTION

A. The Contractor shall at all times protect all work, equipment, and materials and shall comply with all applicable OSHA and General Contractors Association of America safety rules.

B. The Contractor shall observe all ordinances and police regulations concerning the occupation of, and work in, public spaces and shall save and hold harmless LMHA and LMHA employees from and against all claims, damages, losses, and expenses, including attorneys' fees, arising from or related to accidents to persons or property which may occur in connection with the Contractor's operations.

C. The Contractor shall furnish, install, and maintain such temporary work as may be required for the protection of its work, the public, and employees in or about the work site, including, but not necessarily limited to, guardrails, fences, and barricades.

D. As conditions require it, the Contractor shall provide personnel to guard the work after hours, and at other times as necessary, to prevent vandalism, personal injury, damage, etc. Anything that is damaged or defaced because of the Contractor's negligence shall be repaired or replaced by the Contractor at no additional expense to the LMHA.

20. SUPERVISION AND WORKMANSHIP

A. Throughout the progress of the work the Contractor shall keep on the job a competent superintendent, satisfactory to LMHA. The Contractor shall not change the superintendent without LMHA's consent, unless the Contractor terminates the superintendent's employment. The superintendent shall have authority to act on behalf of the Contractor and instruction, direction, and notices given to or by the superintendent shall be binding upon the Contractor.

B. The Contractor shall supervise and consult with each subcontractor during the work. The Contractor shall cause each subcontractor to lay-out and execute its work so as not to interfere with, delay, or damage, the work of other individuals or entities working at the project site.

C. The Contractor shall promptly remove from the premises all work rejected by the LMHA for failure to comply with the Contract Documents, whether incorporated in the construction or not, and the Contractor shall promptly replace and re-execute the Work in accordance with the Contract Documents and without expense to LMHA and shall bear the expense of making good all Work of other Contractors destroyed or damaged by such removal or replacement.

22. CUTTING AND PATCHING

A. Execute all cutting and patching in a neat and workmanlike manner using individuals skilled in the appropriate trades. Patch to match adjacent finishes. Where patching is required, refinish the entire surface of the component being patched.

23. PERMITS AND REGULATORY INSPECTIONS

A. The Contractor shall pay for and obtain from legally authorized agencies all permits and inspections necessary for the completion of work under this contract.

B. All work shall be performed by licensed persons and in accordance with all applicable codes and regulations including, but not necessarily limited to:

1. City and State Building Inspector;
2. National Fire Protection Agency;
3. Kentucky Standards of Safety;
4. Local Insuring Agency;
5. State and Local Plumbing Code;
6. Board of Health; KY Cabinet of Health Services
7. Kentucky State Fire Marshall;
8. National Sanitation Foundation;
9. National and Local Electrical Code;

10. Louisville Metro Air Pollution Control District; and
11. others, as required
12. Metropolitan Sewer District
13. Inspections, Permits, and License

C. This is notice to the Contractor that this project may be subject to Phase I or Phase II, or both, EPA Storm Water Control regulations pursuant to the Clean Water Act (33 U.S. Code 1358) as amended (40 CFR 122.26(b)(14)(x), 33 U.S. Code 1342 (p)(1988), and the Water Resources Development Act of 1992, P.L. 102-580 paragraph 364, 106 Stat. 4797).

D. This is notice to the Contractor that the EPA Storm Water Hotline / Region 4 [(404) 562-9303] is available to assist with questions regarding these requirements. Any and all permits, inspections, fees, etc. required in connection with these requirements shall be the responsibility of the Contractor and shall be acquired at no additional cost to LMHA.

E. The Contractor shall furnish LMHA and consultant with one (1) copy of each required permit.

24. POSTING REQUIREMENTS

A. The Contractor shall maintain a job bulletin board in a location where all project workers will see required postings daily.

B. LMHA will provide the following required postings to the Contractor:

1) Davis-Bacon General Wage Decision;
2) State and Federal notices to employees;
3) EEO notice;
4) Workers' Compensation notice;
5) State and Federal Safety and Health Protection notices; and
6) Contractor's Affirmative Action policy.

25. DRAWINGS AND SPECIFICATIONS

A. The Contract Documents are intended to address all work enumerated under the respective headings. The Contractor shall not take advantage of conflict between, or error in, the Contract Documents. Should any conflict or error be discovered, the Contractor shall immediately request clarification.

B. The Contractor shall not, under any circumstances, scale schematics for the location of equipment or work.

26. COORDINATION OF WORK

A. Owing to the nature of the work, and to prevent confusion and discrepancies, approximate or general dimensions may be indicated in some instances. It is intended that, in some instances, a reasonable limit of variation may be allowed to expedite the making and completion of the work and to serve the best interests of the project as a whole.

B. Other provisions of the Contract further address the Contractor's high duty to coordinate the work to minimize inconvenience to LMHA residents.

28. APPROVALS

A. Final payment shall be released only after LMHA's (and, where necessary, HUD's) written acceptance of all work.

B. The Contractor shall, at no additional cost to LMHA, furnish LMHA with certificates of inspection and approval from the appropriate inspecting agencies. Final payment shall be contingent upon LMHA's receipt of such certifications.

30. INSPECTIONS

A. Except as the Contract otherwise provides, no work of any kind shall be covered-up prior to testing, examination, and approval.

B. All installations shall be inspected by the proper authority to insure compliance with all requirements of this Contract.

C. Where formal inspections (such as punch list or final inspections) by LMHA are required, the Contractor shall provide written notice that such an inspection is needed no less than seven (7) days prior to the date on which such inspection is desired. If HUD inspection is required, the Contractor shall notify LMHA in writing no less than fourteen (14) days in advance.

31. GUARANTEE

A. Except where the contract documents require a greater guarantee period, the Contractor shall guarantee all work to be free from any defects in material and workmanship for a period of at least one (1) year from the date of acceptance.

B. The date of acceptance shall be stated in writing by LMHA when it is satisfied that all punch list and final inspection deficiencies have been corrected.

C. LMHA reserves the right to occupy individual areas at the conclusion of demolition for construction of new facilities.

D. In the event of the failure of any component or material during the period of this guarantee, the Contractor shall promptly restore such components or materials to the standards set forth by this contract at no additional expense to LMHA within a time frame established by LMHA.

32. SECURITY

A. The Contractor shall, at all times, protect and secure all work, equipment, and material.

B. All open conduits and pipes shall be tightly covered and protected against dirt, water, and other injury for the duration of the Contract.

C. It is solely the Contractor's responsibility to maintain the security of the work.

D. The Contractor shall, at no additional cost to LMHA, repair or replace – at LMHA's option – damaged, defective, or defaced work, whether or not such condition may impair the structural integrity or utility of the work.

33. ENERGY STANDARDS

A. The Contractor shall comply with all mandatory standards and policies relating to energy efficiency, which are contained in the state energy plan, issued in compliance with the Energy Policy and Conservation Act (Public Law 94-163).

34. ENVIRONMENTAL PROTECTION

A. The Contractor shall comply with all applicable standards, orders, or requirements issued under Section 3-6 of the Clean Air Act (42 U.S. Code 1857(h)), Section 508 of the Clean Water Act (33 U.S. Code 1358), Executive Order 11738, and Environmental Protection Agency regulations (40 CFR Part 15). This provision applies to contracts and subcontracts in excess of $100,000. Refer to paragraph 22.C, above, for additional information regarding the Clean Water Act.

B. The Contractor shall comply with the standards of OSHA's Health and Safety Partnership Program (HSPP) and shall ensure the application of any and all engineering controls, personal protective equipment, and safety measures necessary to protect the health of employees, LMHA personnel, the general public, and the environment during the removal, installation, or disturbance of any and all mineral fiber and respirable synthetic vitreous fiber (SVF) materials containing fibers characteristically 5 microns, or more, in length with a length to width ratio greater than or equal to 3:1, whether or not such materials, or activities affecting such materials, are regulated by any federal, state, or local agency.

35. SUBMITTALS

A. The Contractor shall submit all required LMHA and HUD forms, certificates, and documentation as directed at the pre-construction conference and as otherwise required under the Contract.

B. The Contractor shall submit additional information, as required by the LMHA, throughout the course of this project.

C. The Contractor shall submit cut-sheets, shop drawings, product data sheets, and other relevant information to the LMHA for review prior to purchase, installation, or use, as may be required by LMHA. No material, equipment, or installation shall be purchased, installed, or used without the prior written approval of the LMHA.

END OF SECTION L

SECTION M

(v.5370)

MBE, WBE & DBE, and SECTION 3 PROGRAMS CONTRACTUAL REQUIREMENTS, FORMS AND DOCUMENTS

LMHA Minority Business Enterprise (MBE), Women Business Enterprise (WBE), Disabled Business Enterprise (DBE) and Section 3 Programs

All bidders must comply with the requirements of LMHA's MBE, WBE and DBE, and Section 3 Programs to be considered responsive.

THE PARTICIPATION PERCENTAGE GOALS FOR THIS PROJECT ARE:
MBE - TWENTY-FIVE PERCENT (25%)
WBE - TEN PERCENT (10%)
DBE - ONE HALF OF ONE PERCENT (.5%)

SECTION 3 REGULATORY REQUIREMENTS:

- TWENTY-FIVE (25) PERCENT OR MORE OF THE TOTAL NUMBER OF LABOR HOURS WORKED BY ALL WORKERS EMPLOYED FOR THIS PROJECT WILL BE PERFORMED BY SECTION 3 WORKERS, AND
- FIVE (5) PERCENT OR MORE OF THE TOTAL NUMBER OF LABOR HOURS WORKED BY ALL WORKERS EMPLOYED FOR THIS PROJECT WILL BE PERFORMED BY TARGETED SECTION 3 WORKERS.

I. LMHA Minority Business Enterprise (MBE), Women Business Enterprise (WBE), and Disabled Business Enterprise (DBE) Programs

A. Generally

This contract includes provisions regarding MINORITY BUSINESS ENTERPRISE (MBE), WOMEN BUSINESS ENTERPRISE (WBE), and DISABLED BUSINESS ENTERPRISE (DBE) solicitation and employment for firms wishing to participate in LMHA federally funded procurement activities that have potential for MBE, WBE, or DBE involvement in accordance with Executive Order 11625.

FAILURE TO MEET THE MBE, WBE and DBE GOALS MAY HAVE A SERIOUS IMPACT ON THE EVALUATION OF A BIDDER'S RESPONSIVENESS!

B. Definitions

The following definitions are used throughout the bid documents and Contract Documents:

1. MBE - Means Minority Business Enterprise. That is, a business which is fifty-one percent (51%), or more, owned by one or more persons who are members of a racial minority ("Racial Minority" is defined below), and in which such persons share economic interests and have proportionate control over management, interest in capital, and interest in earnings (minority/non-minority joint ventures are addressed elsewhere in these documents).

2. WBE - Means Women Business Enterprise. That is, a business which is at least fifty-one percent (51%) owned by one or more Women, or in the case of a publicly owned business, at least 51% of the stock is owned by one or more Women; is managed by, and the daily business operations are controlled by one or more Women; and is a domestic corporation with its home office located in the United States, which is not a branch or subsidiary of a foreign corporation, firm or other business.

3. DBE - Means Disabled Business Enterprise. That is, a business which is fifty-one percent (51%), or more, owned by one or more disabled individuals, or in the case of a publicly owned business, at least 51% of the stock is owned by one or more disabled individuals; is managed by, and the daily business operations are controlled by one or more disabled individual; and is a domestic corporation with its home office located in the United States, which is not a branch or subsidiary of a foreign corporation, firm or other business.

4. MBE Certification -- All MBE, WBE, and DBE firms must be certified through either the Tri-State Minority Supplier Development Council, the Louisville and Jefferson County Human Relations Commission, or must provide evidence satisfactory to LMHA of minority ownership.

5. Racial Minority - Also called "Minority," means any United States Citizen who is:

   a) African American (racial classification 2) - All persons of origins in any black African racial group not of Hispanic origin; or,

   b) Hispanic American (racial classification 3) - All persons of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish descended culture or origin, regardless of race; or,

   c) Asian American (racial classification 4) - All persons having origins in any of the Pre-Magellanic peoples of the Far East, Southeast Asia, the Indian Sub-Continent, or the Pacific Islands; or,

   d) American Indian or Native Alaskan (racial classification 5) - All persons having origins in any of the Pre-Colombian peoples of North

America, including Alaska, who maintain identifiable tribal affiliations, through membership and participation or community-identification; or,

e) Hasidic Jew (racial classification 6) - All persons having origins in the Hasidic Jewish culture, who maintain identifiable cultural affiliations, through membership and participation or community-identification.

6. Disabled Person - Means any person who has a physical or mental impairment which substantially limits one or more of such person's major life activities, or has a record of such an impairment, or is regarded as having such an impairment.

7. Woman - Means a person born with the physical and genetic characteristics commonly associated with the Women gender as currently defined by the professional medical community.

Women and disabled persons are not "Minority" persons, for the purposes of this project, unless they also meet one of the above-indicated definitions of a "Racial Minority."

C. MBE, WBE, and DBE Certification

All MBE, WBE, and DBE firms must be certified through the Tri-State Minority Supplier Development Council, 600 W. Main Street, Louisville, Kentucky 40202, (502) 625-0159, or the Louisville and Jefferson County Human Relations Commission, 410 West Chestnut Street, Louisville, Kentucky 40202, (502) 574-3631. Certifications from other agencies will be reviewed on a case by case basis. A copy of the certification must be submitted upon request.

Questions concerning MBE participation may be directed to the Louisville Metro Housing Authority's MBE/Section 3 Coordinator, Phil Reidinger, at (502) 569-4922 or reidinger@LMHA1.org.

1. Certification through one or more of the listed agencies indicates that a firm meets or exceeds the certifying agency's requirements for MBE, WBE, or DBE certification, however, it should not be construed as implying LMHA approval of such MBE, WBE, or DBE. MBE, WBE, or DBE certification is not indicative of any qualification to perform the work for which the Bidder has proposed the MBE firm. It is the Bidder's inherent responsibility to ensure, prior to submitting a bid, that ALL proposed subcontractors are qualified.

D. MBE, WBE, and DBE Participation in LMHA Contracts

This policy applies to LMHA projects for construction, demolition, renovation, abatement, and similar activities. HUD mandates that the primary procurement responsibility of PHAs is to secure the best goods or services at the best price. However, MBE, WBE, and DBE participation is an integral and highly important

part of LMHA's contracting activities. A minimum MBE, WBE, and DBE participation percentage goal has been established for this project and set forth above. The potential for achieving the MBE, WBE, and DBE participation percentage goal may depend upon the relative availability of MBE, WBE, and DBE firms in the categories of work anticipated. The Contract will be awarded to the responsible and responsive bidder who submits the lowest price, provided award serves LMHA's best interests.

1. IN ORDER TO BE CONSIDERED RESPONSIVE, a bidder must either meet the goals or provide evidence conclusively demonstrating that it made a strenuous, albeit unsuccessful, good faith effort to meet the goals. Failure to aggressively respond to these requirements is grounds for rejection of bid as non-responsive.

2. Law prohibits public housing agencies, including LMHA, from mandating MBE, WBE, or DBE participation. Bidders on LMHA projects are not obligated to use MBE, WBE, or DBE goods or services simply to meet the MBE, WBE, or DBE participation goal if the goods or services are available from non-MBE, non-WBE, or non-DBE sources at lower cost or using the MBE, WBE, or DBE would increase the cost of performance. Likewise, this policy shall not be construed as endorsing the representation of MBE, WBE, or DBE participation, when in fact a substantial portion of the participation proposed to be performed by an MBE, WBE, or DBE will be performed by the Contractor or by a third tier, non-MBE, non-WBE, or non-DBE subcontractor. For example:

   If, on the List of Proposed Subcontractors, the bidder indicates that an MBE, WBE, or DBE will provide case work and trim carpentry services; and, the MBE, WBE, or DBE intends to, or commonly does, subcontract a substantial portion of its work to third tier non-MBE, non-WBE, or non-DBE subcontractors; such conditions would conflict with the intent of LMHA's MBE, WBE, and DBE Policy and the bidder's MBE, WBE, or DBE participation percentage would be reduced commensurately and its responsiveness reevaluated accordingly. The foregoing statements should not be construed as diminishing LMHA's commitment to MBE, WBE, or DBE participation. LMHA is committed to MBE, WBE, and DBE participation and expects contractors to employ MBE, WBE, and DBE firms to the fullest extent feasible.

E. Calculating MBE Participation

1. General -- An MBE's, WBE's, and DBE's participation in the Contract may count toward the goal to the extent that the MBE, WBE, or DBE performs Contract work with its own forces or through an MBE, WBE, or DBE subcontractor that uses its own forces. Work that an MBE, WBE, or DBE subcontracts to a non-MBE, non-WBE, or non-DBE subcontractor does not count toward the goal. Any contractor, subcontractor, or joint venture, that

claims MBE, WBE, or DBE participation may be required, at any time, to produce evidence that the portion of the total contract price claimed was actually awarded to, performed, or supplied by MBE, WBE, or DBE firms.

2. MBE, WBE, and DBE Qualifications -- For their participation to count toward the goal, MBE, WBE, and DBE firms must be currently certified as MBE, WBE, or DBE firms at the time of the bid opening. MBE, WBE, and DBE firms, to participate in the Contract, must meet all the responsiveness and responsibility requirements imposed on other contractors and subcontractors under the Contract.

3. Commercial Utility -- The participation of an MBE, WBE, or DBE may count toward the goal only if the MBE, WBE, or DBE performs a commercially useful function in executing the Contract work.

   a) An MBE, WBE, or DBE firm's function may be commercially useful if it includes direct, day-to-day responsibility for significant work of the Contract and the MBE, WBE, or DBE actually fulfills its responsibilities by performing, managing, and supervising that work.

   b) Responsibility for negotiating prices, determining quality and quantities, ordering, installing, and paying for materials and supplies involved in the MBE's, WBE's, or DBE's portion of the Contract work may, also, indicate commercial utility.

   c) An MBE's, WBE's, or DBE's function is not commercially useful if the firm's actual role is limited to that of an extra participant in a transaction, contract, or project through which funds are passed in order to present the appearance of MBE, WBE, or DBE participation. In determining whether a firm is an extra participant, LMHA may examine similar transactions, contracts, or projects, particularly those in which MBE, WBE, or DBE firms do not participate.

   d) An MBE, WBE, or DBE that does not perform, or bear and exercise responsibility for, at least 12 percent of the total cost of its Contract work with its own forces, or that subcontracts a greater portion of its Contract work than would be expected under normal industry practice for the type of work involved, is preemptively not performing a commercially useful function. An MBE, WBE, or DBE may challenge the presumption that it is not performing a commercially useful function. Because no privity can exist between LMHA and a subcontractor, MBE, WBE, and DBE subcontractors must assert such challenges through the prime contractor.

   e) LMHA may evaluate industry practices, the amount and type of work awarded to the MBE, WBE, or DBE, and any other factors LMHA deems appropriate, to determine whether a function is commercially useful.

4. MBE, WBE, or DBE Prime Contractors -- MBE, WBE, or DBE firms are under the same obligations as any other prime contractor with respect to LMHA's MBE, WBE, or DBE goals. To receive MBE, WBE, or DBE participation credit, an MBE, WBE, or DBE prime contractor must perform at least 12% of the Contract work with its own forces. MBE, WBE, or DBE prime contractors may be credited with MBE, WBE, or DBE participation to the extent that they perform the Contract work with their own forces and employ MBE, WBE, or DBE subcontractors pursuant to the provisions of this policy. For example:

   If an MBE, WBE, or DBE prime contractor will perform $12,000-worth of work with its own forces, and the total contract price is $100,000, MBE, WBE, or DBE participation would be 12%. Thus, if the MBE, WBE, or DBE participation goal was 20%, the MBE, WBE, or DBE prime contractor would be short of the goal and required to either obtain another 8% participation or demonstrate fruitless good faith efforts to obtain another 8% and request a waiver of that portion of the goal.

5. Non-MBE, WBE, or DBE Prime Contractors - may be credited with MBE, WBE, or DBE participation based on the dollar value of that portion of the total contract work subcontracted to MBE, WBE, or DBE firms and performed by such MBE, WBE, or DBE firms using their own forces or through third tier MBE, WBE, or DBE subcontractors that use their own forces. For example:

   If a non-MBE, WBE, or DBE prime contractor subcontracts $15,000-worth of the total contract work to one or more MBE, WBE, or DBE subcontractors, and the total contract price is $75,000, MBE, WBE, or DBE participation would be 20% ($15,000/$75,000).

6. MBE, WBE, or DBE Subcontractors -- To receive MBE, WBE, or DBE participation credit, an MBE, WBE, or DBE subcontractor must perform at least 12% of its portion of the Contract work with its own forces. An MBE, WBE, or DBE subcontractor's participation in the Contract counts toward the goal to the extent that the MBE, WBE, or DBE performs Contract work with its own forces and through third-tier MBE, WBE, or DBE subcontractors that use their own forces. Work that an MBE, WBE, or DBE subcontractor subcontracts to a non-MBE, WBE, or DBE subcontractor does not count toward the goal. For example:

   If an MBE, WBE, or DBE firm is subcontracted to fabricate and supply equipment for this project, at least 12% of the fabrication must be performed by the MBE, WBE, or DBE firms' own forces, in its own facility.

   a) A prime contractor shall receive no credit for the participation of an MBE, WBE, or DBE subcontractor unless the prime contractor, before the start of work, delivers to LMHA a fully executed original counterpart of the agreement between the prime contractor and the MBE, WBE, or DBE subcontractor.

b) Such agreement must bear the prime contractor's and MBE, WBE, or DBE subcontractor's notarized signatures, must state the price the MBE, WBE, or DBE will receive for its work, and must include a reasonably detailed description of the work the subcontractor will perform.

7. Joint Ventures - Joint ventures between an MBE, WBE, or DBE and a non-MBE, WBE, or DBE, bidding and performing as a joint venture prime contractor or sub-contractor, may count toward the goal to the extent of the dollar value of the Contract work performed with the MBE, WBE, or DBE party's forces. For example:

If the joint venture will perform $35,000-worth of the total contract work with its joint forces, and the MBE, WBE, or DBE party's forces will perform $15,000-worth of that work, and the total contract price is $100,000, MBE, WBE, or DBE participation would be 15% ($15,000/$100,000).

If, in the preceding example, the joint venture was the prime contractor and employed MBE, WBE, or DBE, WBE, or DBE subcontractors to perform $10,000-worth of the remaining total contract work, MBE, WBE, or DBE participation would be 25% (($15,000 + $10,000)/$100,000).

a) A joint venture shall receive no MBE, WBE, or DBE participation credit unless, before the start of work, it delivers to LMHA a fully executed original counterpart of the joint venture agreement.

b) Such agreement must bear the notarized signatures of all parties to the agreement, must state the sum each party will receive for its work, and must include a reasonably detailed description of the work each party will perform.

c) To be counted at all, the MBE, WBE, or DBE party's portion of the dollar value of the work must be distinct and clearly defined.

8. Materials and Supplies - Any contractor or subcontractor may, under certain conditions, claim MBE, WBE, or DBE participation credit for MBE, WBE, or DBE suppliers who provide materials for the Contract work. MBE, WBE, or DBE supplier participation is based, generally, on the dollar value of the goods purchased from the MBE, WBE, or DBE supplier. For example:

Subject to the conditions following this example, if a non-minority prime contractor purchases $20,000-worth of supplies from an MBE, WBE, or DBE supplier, and the total contract price is $100,000, MBE, WBE, or DBE participation would be 20% ($20,000/$100,000).Materials and supplies purchased from MBE, WBE, or DBE firms for use in the Contract may count toward the goal as follows:

a) If the materials or supplies are purchased from an MBE, WBE, or DBE manufacturer, 100 percent of the cost of the materials or supplies may count toward the goal.

(1) For the purposes of these provisions, a "manufacturer" is a business entity that operates or maintains a factory or production facility that routinely produces, on its premises and in the normal course of its business, materials, supplies, articles or equipment required under the Contract.

b) Materials and supplies purchased from MBE, WBE, or DBE firms who are regular retail or wholesale dealers will only be counted toward the goal at 60 percent of their cost.

(1) For the purposes of these provisions, a "regular retail or wholesale dealer" is a business entity that:

(a) owns, operates, or maintains a store, warehouse, or other establishment in which materials, supplies, articles or equipment required under the Contract are bought, kept in stock, and regularly sold or leased to the public in the normal course of business; and

(b) is an established, regular business that engages, as its principal business and under its own name, in the purchase and sale or lease of the items required under the Contract.

(2) A person may be a regular retail or wholesale dealer in such bulk items as petroleum products, steel, cement, gravel, stone, or asphalt without owning, operating, or maintaining a place of business as described above, if the person owns and operates distribution equipment for distribution of such products.

(3) Long-term lease agreements by which a regular retail or wholesale dealer supplements its own distribution equipment may be acceptable as to the goal, but ad hoc or contract-by-contract agreements for that purpose are not.

(4) Packagers, brokers, manufacturers' representatives, and other persons who arrange or expedite transactions are not regular retail or wholesale dealers within the meaning of these provisions. Such persons' or entities' participation shall not count toward the MBE, WBE, or DBE or DBE goal.

9. Fees or commissions -- charged by an MBE, WBE, or DBE that is neither a manufacturer nor a regular retail or wholesale dealer, for assistance in procuring materials or supplies, or for fee or transportation charges for delivering materials or supplies required under the Contract, may count toward the goal, provided LMHA finds such fees or commissions are reasonable and not excessive in comparison to fees customarily allowed for similar services. No portion of the cost of the materials and supplies

themselves shall count toward the goal under these circumstances, unless they qualify under one of the other provisions of this subsection.

10. Professional Services -- Fees or commissions charged by an MBE, WBE, or DBE for providing a bona fide service, such as professional, technical, consultant, or managerial services, or for providing bonds or insurance specifically required for the performance of the Contract, may count toward the goal, if LMHA finds them reasonable and not excessive in comparison to fees customarily allowed for similar services.

11. Any contractor, subcontractor, or joint venture that claims MBE, WBE, or DBE participation may, at any time, be required to produce evidence that the portion of the total contract price claimed was actually awarded to, and performed or supplied, by MBE, WBE, or DBE firms.

F. Required Forms

Bidders must submit the following two (2) forms, among others, as a part of the bid proposal, regarding proposed employment of MBE, WBE, or DBE firms on this project:

1. SCHEDULE OF MBE, WBE, AND DBE PARTICIPATION

   a) The Bidder shall list, on this form, all MBE, WBE, or DBE firms proposed to perform as prime contractors or subcontractors for this project; the type of work to be performed; the anticipated start and completion dates for the work to be performed; and the agreed upon price for the work.

   b) The Bidder, by completing this form, represents that, if awarded this contract, it will enter into formal contracts (provided each MBE, WBE, or DBE is accepted, in writing, by LMHA), in the amounts indicated, with the MBE, WBE, or DBE firms listed on this form.

2. MBE, WBE AND DBE WAIVER REQUEST INFORMATION SHEET

   a) In the event the Bidder is unable to achieve the MBE, WBE, or DBE participation percentage goal, the Bidder shall list on this form all MBE, WBE, or DBE firms contacted and/or considered, but not proposed to participate in this project, and the reasons they are not proposed to participate.

FAILURE TO SATISFY THE MBE, WBE, or DBE PARTICIPATION PERCENTAGE GOALS MAY HAVE A SIGNIFICANT ADVERSE IMPACT ON A BIDDER'S RESPONSIVENESS!

G. Evidence of Responsiveness

As evidence that the Bidder has made a significant good faith effort to involve MBE, WBE, or DBE firms in this project, the Contractor, upon request, shall make available to the Louisville Metro Housing Authority such documentation as is described below.

Bidders that fail to meet MBE, WBE, or DBE goals and fail to demonstrate sufficient good faith efforts to merit a waiver, may be required to forfeit their bid guaranty as agreed liquidated damages.

H. Waiver of MBE, WBE, or DBE Goals

Minority Business Enterprise participation is a priority objective of this agency and LMHA's MBE, WBE, and DBE policy applies to all construction and abatement contracts. If, because of extreme circumstances, a bidder cannot meet the MBE, WBE, or DBE participation percentage goal, LMHA may grant a full or partial waiver of the goal. LMHA will, however, grant a waiver of the MBE, WBE, or DBE participation percentage goal only upon receipt of persuasive evidence that a bidder has made diligent, albeit ultimately unsuccessful, efforts to meet the MBE, WBE, or DBE participation percentage goal (as further explained below).

1. Bidders must make <u>every</u> reasonable effort to meet the MBE, WBE, or DBE goals.

   Limited or merely formalistic efforts are not considered "good faith" efforts. The bidder must demonstrate that, given all relevant circumstances, it actively and aggressively endeavored to meet the MBE, WBE, or DBE goals.

2. In the event a bidder finds that it cannot fully satisfy the MBE, WBE, or DBE goals of this solicitation, the bidder must submit a written request for a full or partial waiver of the goals and receive approval prior to submission of bid. <u>All request for waivers for MBE, WBE, and DBE must be submitted with the "2nd Day Submission" documents after the bid opening.</u>

   The "MBE, WBE and DBE Waiver Request Information Sheet" can be found on Page 16 of this Section.

IF THE BIDDER WILL NOT USE <u>ANY</u> SUBCONTRACTORS OR HAS MET THE <u>FULL</u> MBE, WBE, AND DBE GOALS, IT IS NOT NECESSARY TO REQUEST A WAIVER.

   a) The written request for a waiver must explain how the bidder views and evaluates the subcontractable components of a project and why the bidder was unable to attain the MBE, WBE, or DBE participation percentage goal. The request must also include detailed narrative statements describing the bidder's "good faith" efforts to secure MBE, WBE, and DBE participation. If bidder has requested such waiver from LMHA within the last five (5) years, submit copies of all waiver requests.

3. Examples of "good faith efforts" to attain the MBE, WBE, or DBE goal include, but are not necessarily limited to:

   a) Attending scheduled meetings, regarding the project.

b) Providing written notice, (preferably certified mail) to a reasonable number of MBE, WBE, and DBE firms requesting bids. A reasonable number means *at least* as many MBE, WBE, or DBE firms as non-MBE, WBE, or DBE firms, in each trade category, must be contacted. Copies of certified letters sent to MBE, WBE, or DBE firms requesting bids, and original, signed, receipts, or copies of telegrams soliciting bids from MBE, WBE, or DBE firms, indicating the date of delivery, would be considered evidence of such efforts.

c) Allowing sufficient time (five working days, or more, as time permits) for MBE, WBE, and DBE firms to respond to a written notice. Sufficient time means initiating contact with MBE, WBE, or DBE firms at least as far in advance of the bid date as contact is initiated with non-MBE, WBE, or DBE firms. Original responses from MBE, WBE, or DBE firms indicating the reasons why they do not wish to participate in this project and bids received from MBE, WBE, or DBE firms on those firm's letterhead or standard bid forms would be considered evidence of such efforts.

d) Following up written notification by telephone or other means. Date-stamped copies of telephone conversation records and faxed letters would be considered evidence of such efforts.

e) Contacting MBE, WBE, and DBE assistance agencies and organizations (see Section J of Official Bid Package for lists) and the LMHA's MBE/Section 3 Coordinator at (502) 569-4922, for assistance in locating qualified MBE, WBE, or DBE firms. Date-stamped copies of telephone conversation records and faxed or mailed letters would be considered evidence of such efforts.

f) Selecting portions of the work to be performed by MBE, WBE, and DBE firms in order to increase the likelihood of meeting the MBE, WBE, or DBE goals. Documentation demonstrating that extra effort was made to solicit MBE, WBE, or DBE bids for categories of work in which MBE, WBE, or DBE firms are particularly well represented in the geographical area of the project would be considered evidence of such efforts.

g) Providing MBE, WBE, and DBE firms with adequate information about the project when requesting quotations (i.e., identifying potential subtrades involved in the project and identifying a potential dollar range for those subtrades). Copies of certified letters sent to MBE, WBE, and DBE firms, and original, signed, receipts, date-stamped copies of telephone records and faxed or mailed follow-up letters, or copies of telegrams sent to MBE, WBE, and DBE firms, would be considered evidence of such efforts.

h) Advertising in general circulation media (e.g., Courier-Journal), and media aimed at minorities (e.g., Louisville Defender), at least

20 days before bids are due. Or, if 20 days are not available, publication for a shorter, but maximum available, period is acceptable. Copies of legal advertisements published as an attempt to obtain MBE, WBE, and DBE involvement would be considered evidence of such efforts.

i) Making efforts to assist MBE, WBE, or DBE firms in obtaining bonding, credit, or insurance. Date-stamped copies of telephone conversation records and faxed or mailed letters to MBE, WBE, or DBE firms and/or bondsmen, creditors, or insurers would be considered evidence of such efforts.

j) Making efforts to meet and negotiate with potential MBE, WBE, and DBE Bidders prior to the bid opening. Copies of certified letters sent to MBE, WBE, and DBE firms and original, signed, receipts, date-stamped copies of telephone records and faxed or mailed follow-up letters, or copies of telegrams sent to MBE, WBE, and DBE firms, would be considered evidence of such efforts.

k) Efforts made by the Bidder to expand its search for MBE, WBE, and DBE firms, beyond the usual geographic boundaries. Documentation demonstrating that such efforts were made would be considered evidence of such efforts.

4. LMHA reserves the right to examine the Bidder's bid preparation materials, including all requests for bids the Bidder issued to potential subcontractors, the Bidder's bid calculation work sheets, and the Bidder's telephone records, notes, and any other information LMHA believes may be helpful in verifying the Bidder's assertions.

5. LMHA's "MBE, WBE and DBE Waiver Request" review protocol includes the following steps:

a) The contractor's "MBE, WBE AND DBE WAIVER REQUEST INFORMATION SHEET" and supporting documentation will be reviewed by the MBE, WBE, DBE and Section 3 Coordinator and the appropriate LMHA Directors overseeing the solicitation. The Waiver Request Reviewers Team will collectively make a determination for the appropriate wavier action.

b) The MBE, WBE, DBE and Section 3 Coordinator will send the written recommendation from the Waiver Request Reviewers Team to the Deputy Executive Director. If necessary, the Deputy Executive Director will schedule a meeting with the Waiver Request Reviewers Team for additional dialogue regarding the suggested waiver action.

c) The Deputy Executive Director will forward its and the Waiver Request Reviewers Team's recommendations to the Executive Director for final review and approval. This recommendation will include "MBE, WBE AND DBE WAIVER REQUEST INFORMATION

SHEET" and supporting documentation, and a transmittal signature sheet.

d) The MBE, WBE, DBE and Section 3 Coordinator will send a written notification regarding the "MBE, WBE AND DBE WAIVER REQUEST INFORMATION SHEET" decision to the contractor or offeror.

6. The bidder's delivery of a request for waiver does not, in and of itself, ensure that such a request will be granted.

a) A full or partial waiver may be granted only after the Louisville Metro Housing Authority has thoroughly reviewed the project's MBE, WBE, or DBE participation potential. Documentation supporting a request for waiver, if such evidence exists, may be presented to the Louisville Metro Housing Authority's Executive Director for a final decision.

b) If a waiver is granted, and there are no other impediments to the award of the contract, the contract award process may proceed.

c) If a waiver is not granted, or if no request for waiver is received, and the bid is otherwise acceptable, the Louisville Metro Housing Authority may require the Bidder to satisfy the total MBE, WBE, and DBE goals at no additional cost to the Louisville Metro Housing Authority or may deem the Bidder non-responsive.

I. Replacing MBE, WBE, or DBE Subcontractors

1. Any contractor who proposes to replace a proposed or accepted MBE, WBE, or DBE subcontractor must maintain the MBE, WBE, or DBE participation percentage that existed prior to the replacement of that subcontractor, or, if possible, achieve an even greater MBE, WBE, or DBE participation percentage. If the contractor finds it cannot satisfy these requirements, it must submit a request for waiver of the MBE, WBE, or DBE participation percentage goal, as prescribed above.

2. LMHA reserves the right to conduct compliance reviews on minority and non-minority contractors that utilize MBE, WBE, or DBE subcontractors, or perform as joint ventures. Contractors shall maintain records of all MBE, WBE, or DBE participation for three (3) years following completion of the project. Failure on the part of the contractor to comply with these requirements could result in the withholding of payment, termination of the Contractor's right to proceed with the work, legal fines, imprisonment, or all the above.

J. Assistance to MBE, WBE, and DBE firms

The Louisville Metro Housing Authority actively works to assist minority vendors and contractors/subcontractors. LMHA is committed to providing equal opportunities for Minority Business Enterprises (MBE, WBE, and DBE firms).

Such opportunities are advertised through newsletters and newspapers, including minority newspapers, minority purchasing councils, and the Department of Housing and Urban Development.

When requested, LMHA will provide special assistance, to the fullest extent possible, to MBE, WBE, and DBE firms, by providing instruction on the preparation of bids, MBE, WBE, and DBE policy, and any other requirements related to LMHA's MBE, WBE, and DBE program, in connection with activities including but not necessarily limited to:

1. Architectural, Engineering, and similar Professional Services contracts;
2. Construction and Maintenance contracts;
3. Purchase Contracts; and,
4. Bank Deposits.

MBE, WBE, or DBE firms, and others, seeking assistance in these areas should first contact:

1. Tri-State Minority Supplier Development Council, 600 West Main Street, Louisville, KY 40202.
   Contact: (502) 625-0159

2. Kentucky Cabinet for Economic Development, Department of Existing Business & Industry, Minority Business Division, 2201 Capital Plaza Tower, Frankfort, KY 40601.
   Contact: (502) 564-2064

3. Louisville and Jefferson County Human Relations Commission, 410 West Chestnut Street, Suite 300A, Louisville, KY 40202.
   Contact: (502) 574-3631

NOTE: The following forms on pages 15-23 shall be completely filled out and submitted with the bid.

SCHEDULE OF MBE, WBE, AND DBE PARTICIPATION

_____
(Name of Bidder)

For each MBE, WBE, or DBE firm proposed to participate in this project, list the firm's name, business address, category of work, percentage of total bid to be performed by the firm, and the firm's Federal Tax ID number in the space provided below. Use additional sheets if necessary.

_____

_____

_____

_____

_____

_____

_____

_____

The combined total of MBE participation proposed is _____ % of the total bid amount.
The combined total of WBE participation proposed is _____ % of the total bid amount.
The combined total of DBE participation proposed is _____ % of the total bid amount.

In addition to completion of this form, a Bidder who has met the MBE, WBE, and DBE goals must submit a copy of the signed sub-bid from each MBE, WBE, and DBE subcontractor listed with its bid.

The bidder, if successful, agrees to enter into a formal contract with each of the above referenced firms, in the amounts indicated, provided those firms are acceptable to the Louisville Metro Housing Authority.

NOTE: With respect to all MBD, WBE and DBE firms, whether proposed or otherwise, Bidder [or Contractor] hereby certifies that it and its fiduciaries and affiliates (i) have engaged in a fair and impartial manner with all such firms; (ii) have not utilized any such firms to obtain any unfair advantage; (iii) have made no negligent or fraudulent representations or misrepresentations to or about such firms; (iv) and there exist no side deals or undisclosed contracts or agreements that would otherwise frustrate the purpose of contracting with any MBD, WBE or DBE firms.

Signature/Title: _____ Date: _____

NOTE: Failure to complete and submit THIS form or comply with directions therein is ground for bid rejection.

MBE, WBE AND DBE WAIVER REQUEST INFORMATION SHEET

Contractor's Name: _____
Business Address, City, State and Zip Code:

_____
_____
_____
Telephone Number: _____
Contract Person: _____

Project Name and Proposal Number:

_____
WAVIER REQUESTED FOR: (fill in as needed for any that apply)

MBE: _____ WBE: _____ DBE: _____
% Requested: _____ % Requested: _____ % Requested: _____

NOTE: The "MBE, WBE and/or DBE waiver percentages" requested, when added with the "MBE, WBE and/ or DBE percentages" proposed on Page 15, must add up to the percentage needed for each category (MBE is 25%; WBE is 10%; and DBE is 0.5%).

STEPS TAKEN TO MEET GOALS: (must choose one for respond for each "step":
PROVIDE EVIDENCE FOR EACH STEP TAKEN.

		YES	NO
1	Provide written notice to potential bidders		
2	Allowed sufficient time to respond		
3	Follow-up written notification to potential bidders		
4	Contacting MBE, WBE, and DBE Agencies		
5	Selecting portions of work to be performed by MBE, WBE and DBE		
6	Advertising in general circulation media		
7	Making efforts to meet and negotiate with potential MBE, WBE and DBE bidders		

PROVIDE A WRITTEN NARRATIVE OF THE "GOOD FAITH EFFORTS" TAKEN AND RESULTS: (Use Additional Sheets if Necessary):

_____
_____
_____

NOTE: With respect to all MBE, WBE and DBE firms, whether proposed or otherwise, Bidder [or Contractor] hereby certifies that it and its fiduciaries and affiliates (i) have engaged in a fair and impartial manner with all such firms; (ii) have not utilized any such firms to obtain any unfair advantage; (iii) have made no negligent or fraudulent representations or misrepresentations to or about such firms; (iv) and there exist no side deals or undisclosed contracts or agreements that would otherwise frustrate the purpose of contracting with any MBE, WBE or DBE firms.

Signature/ Title: _____ Date: _____

SUMMARY LIST OF PROPOSED SUBCONTRACTORS

The following list of proposed subcontractors is required to be submitted with each bidder's proposal, in accordance with the requirements of Section C of this solicitation. All subcontractors are subject to the approval of LMHA. PROPOSED SUBCONTRACTORS AND SUBCONTRACT AMOUNTS SHALL NOT BE CHANGED, NOR SHALL ANY ADDITIONAL SUBCONTRACTORS BE EMPLOYED, WITHOUT THE EXPRESS WRITTEN CONSENT OF THE LOUISVILLE METRO HOUSING AUTHORITY.

NAME OF SUBCONTRACTOR	CATEGORY OF WORK	$ Amount
1.		
2.		
3.		
4.		
5.		
6.		

(Employer ID numbers must be provided upon request)
Use Additional Sheets If Necessary

THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

NOTE: WITHIN TWO WEEKS OF CONTRACT EXECUTION, THE GENERAL CONTRACTOR SHALL SUBMIT, FOR THIS CONTRACT, COPIES OF ALL SUBCONTRACTOR CONTRACTS OR WRITTEN AGREEMENTS TO THE LOUISVILLE METRO HOUSING AUTHORITY

NOTE: If third tier subcontracts are intended, the information on the following page must be provided for each proposed subcontractor.

NOTE: With respect to all MBE, WBE and DBE firms, whether proposed or otherwise, Bidder [or Contractor] hereby certifies that it and its fiduciaries and affiliates (i) have engaged in a fair and impartial manner with all such firms; (ii) have not utilized any such firms to obtain any unfair advantage; (iii) have made no negligent or fraudulent representations or misrepresentations to or about such firms; (iv) and there exist no side deals or undisclosed contracts or agreements that would otherwise frustrate the purpose of contracting with any MBE, WBE or DBE firms.

Signature/Title: _____ Date: _____

NON-MBE, WBE, DBE SUBCONTRACTOR/SUPPLIER FORM

ONE FORM FOR EVERY PROPOSED NON-MBE, WBE, AND DBE SUBCONTRACTOR/SUPPLIER MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

In addition to conforming to all other requirements of the Invitation to Bid, to be considered responsive, a Bidder must submit this form, fully completed, for every non-minority business enterprise subcontractor/supplier proposed.

Company Name, Address, Telephone Number, and Point of Contact:

_____

_____

_____

_____

_____

Dollar Value of Proposed Subcontract/Purchase Order:

$ _____

Description of Proposed Services and/or Materials:

_____

_____

_____

_____

_____

_____

The penalty for making false statements in offers (10 year imprisonment and/or S10,000 fine) is prescribed in 18 U.S.C. 1001.

NOTE: Failure to complete and submit THIS form or comply with directions therein is ground for bid rejection.

EMPLOYMENT DEMOGRAPHICS

This form to be completed and submitted by the prime contractor and every proposed subcontractor. Failure to complete and submit this form is grounds for rejection.

Company Name: _____ ☐Contractor ☐Subcontractor

1 Last Name	2 First Name	3 Job Title	4 Date Hired	5 Description of Work	6 Race	7 Sec 3

Certified By: _____ Date: _____
(Authorized Officer's Signature)

In witness whereof, I hereunto set my hand and official seal:

_____
(Notary's Signature)

_____
(Notary's Printed Name)

AFFIX
NOTARY'S
SEAL

My commission expires _____.

See the following page for instructions for completing this form.

The penalty for making false statements in offers (10 years imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

Instructions for Completing EMPLOYMENT DEMOGRAPHICS Form

1. Duty to Submit Form -- Every bidder shall complete the Employment Demographics form (hereafter, the Form). Every bidder shall ensure that each of its sub-bidders also completes the Form. The Bidder shall submit fully executed Forms for itself and each sub-bidder, with its bid, in the package labeled "Supplemental Bid Information."

2. Space Constraints/Additional Forms -- If the space provided on a single Form is insufficient to list every employee (see definition below)of the bidder or sub-bidder completing the Form (hereafter, the Entity), such Entity shall use additional Forms. Said Entity shall, however, ensure that each separate Form is dated, signed, and notarized. Each Official Bid Package contains one (1) blank copy of the Form. From that, the Bidder shall make as many copies as needed to ensure compliance with the preceding requirements.

3. Completing the Form -- The Form is divided into seven numbered columns. Write the appropriate name and check the appropriate box at the top of the Form, then complete each column as follows:

Columns 1 and 2 -- Identify, by name, each and every employee, officer, principal, and agent of the Entity. Identify every such person (hereafter, the employee), whether or not intended to perform work under or related to this Contract. Be careful to list each employee by last name first. List only proper, legal names, do not list nicknames. Do not list names of persons the Entity employs as independent contractors. If the employee routinely works less than 37 and 1/2 hours per week, write the letter "P" in the left margin adjacent to the employee's name.

Column 3 -- State the employee's job title (e.g., secretary, laborer, carpenter, CEO). Use the job titles the Entity actually, routinely uses to describe the employee.

Column 4 -- State the date upon which the Entity hired the employee. If the employee has left the Entity's employ in the past and returned to work for the Entity again, state the most recent date of hire.

Column 5 -- Describe the nature of the work the employee routinely performs for the Entity. For example, if the employee's job title is "Laborer," the employee's work may be described as "performs unskilled physical labor." Or, a "Secretary" might be described as doing "filing, typing, etc." Use additional lines if necessary, to provide a clear description of an employee's duties.

Column 6 -- State the employee's race. Use the racial classifications provided in page 2, Section M. Use the number 1 for Caucasian. If you write "other" or a similar classification in Column 6, attach a signed statement explaining in detail exactly what is meant by such description. Attach a separate signed statement for each employee so described, tailoring each such statement to the employee to whom it refers.

Column 7 -- State if the employee is certified as a Section 3 Workers (as per II, A. 1.(g)) with "S" or Targeted Section 3 Workers (as per II, A, 1.(j)) with "T" or leave blank if there is no Section 3 certification. Documentation of Section 3 status must be provided upon request.

4. Each Form shall be signed and dated by an authorized officer of the Entity and shall be notarized.

AGREEMENT TO NOTIFY LMHA OF JOB OPENINGS

(This form to be completed and submitted by prime contractor and all subcontractors.)

By my signature below, _____ (hereafter "the Company"), agrees to the
(Company's Name)
following conditions:

1. The Company shall, if awarded the contract for which this Bid is offered, give LMHA notice of any and all job openings that may arise at the Company during the course of that contract.

2. Such notice shall be in writing and mailed, first class, to LMHA via the U.S. Postal Service within two business days after such opening arises. The notice shall describe the minimum qualifications and requirements of the job, the nature of the work, the expected pay rate or range, the place and manner of submitting applications, the name, address and telephone number of the person to contact to obtain an application or additional information, and the date by which applications must be submitted.

3. LMHA will notify its residents of such job openings and encourage qualified residents to submit applications for employment.

4. The Company will, if it receives an application from a qualified LMHA resident, give that application and applicant the same opportunity and consideration for the job as would be given any other, similarly qualified applicant and, if such applicant is the most qualified applicant and there is no bar to employing the applicant, the Company will hire the applicant for the job if it hires anyone for the job.

Date: _____ By: _____
(Authorized Officer's Signature)

In witness whereof, I hereunto set my hand and official seal:

_____ _____
(Notary's Signature) (Notary's printed name)

My commission expires _____. AFFIX NOTARY'S SEAL

STATEMENT OF INTENT TO PERFORM AS A MINORITY BUSINESS ENTERPRISE CONTRACTOR/SUBCONTRACTOR

(Separate form required for each MBE, WBE, and DBE prime or sub-bidder)

Name of Prime Bidder: _____

Name of MBE firm completing this form: _____

The undersigned wishes to perform work in connection with the above referenced project as:

☐ Individual ☐ Corporation ☐ Partnership ☐ Joint Venture

The undersigned hereby confirms its status as a Minority Business Enterprise as defined by LMHA and that a copy of the certification from the agency specified in Section C of this solicitation, or other evidence, is attached hereto.

The undersigned intends to perform the following work in connection with this project (specify, in detail, the work to be performed):

_____

_____

_____

Bid amount to be entered by sub-contractor $ _____

The undersigned MBE projects its start and completion dates for the work as follows:

Project Start: _____ Project Completion: _____

BY: _____ _____
(Signature of MBE's Principal) (Name and Title)

THIS FORM MUST BE COMPLETED, and included in this Supplemental Bid Information package, by each and every MBE contractor or subcontractor proposed to participate in this project.

The penalty for making false statements in offers (10 years imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

AFFIDAVIT OF MINORITY BUSINESS ENTERPRISE

(Separate form required for each MBE, WBE, and DBE proposed)

State of _____ County of _____

I hereby declare and affirm that _____ is a Minority
(Bidder's printed company name)

Business Enterprise (MBE), as defined by LMHA in the bid solicitation and that I am an officer of the above referenced MBE firm, and that I am authorized to provide information required by LMHA to support that firm's representation that it is a Minority Business Enterprise.

I do solemnly declare and affirm, under the penalties of perjury, that the foregoing is true and correct, and that I am authorized, on behalf of the above-named firm, to make this affidavit.

_____ _____
(Signature of Affiant) (Printed name and title of Affiant)

STATE OF KENTUCKY, COUNTY OF JEFFERSON, CITY OF LOUISVILLE

On this _____ day of _____, 20_____,

_____, the undersigned officer, personally appeared before me,
(Printed name of Affiant)

known to me to be the person described in the foregoing Affidavit, and acknowledged that he/she executed the same in the capacity therein stated and for the purposes therein contained.

In witness whereof, I hereunto set my hand and official seal:

_____ _____
(Notary's Signature) (Notary's printed name)

My commission expires _____. AFFIX NOTARY'S SEAL

THIS FORM MUST BE COMPLETED, and included in this Supplemental Bid Information package, by each and every minority contractor or subcontractor proposed to participate in this project.

The penalty for making false statements in offers (10 years imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

LEGITIMACY OF JOINT VENTURE

(Separate form required for each joint venture)

Majority Party's Name, Address, Phone, and Principal's Name:

_____
_____
_____

Minority Party's Name, Address, Phone, and Principal's Name:

_____
_____
_____

Portion of work to be performed by Majority Party: _____% $_____
Portion of work to be performed by Minority Party: _____% $_____

(Provide additional details on following page if applicable.)

"The undersigned do hereby declare and affirm, under the penalties of perjury, that the foregoing statements are true and correct and that all material information necessary to identify and explain the terms and operation of the joint venture, and the intended participation by each joint venture, in this undertaking, is attached hereto. Further, the undersigned agree to provide LMHA current, complete, and accurate information regarding the actual joint venture work, payments and any proposed changes in the above-stated arrangements, and to permit audits and/or examinations of books, records, and files of the joint ventures by authorized representatives of LMHA. The undersigned recognize and acknowledge that the statements herein are given under oath and any material misrepresentation will be grounds for terminating any contract that may be awarded the undersigned for this project."

BY: _____ Date: _____
(Signature of Majority Party's Principal)

BY: _____ Date: _____
(Signature of Minority Party's Principal)

Which, if any, of the parties to this venture are MBE firms? _____

_____

THIS FORM MUST BE COMPLETED, and included in this *Supplemental Bid Information* package, by every joint venture proposed to participate in this project (ATTACH the Joint Venture Agreement and Letters of Incorporation).

The penalty for making false statements in offers (10 years imprisonment and/or $10,000 fine) is prescribed in 18 U.S.C. 1001.

DETAILS OF JOINT VENTURE AGREEMENT

(Separate form required for each joint venture)

The Majority Party normally employs _____ tradespersons and performs work in the following trades:

_____.

The Minority Party normally employs _____ tradepersons and performs work in the following trades:

_____.

Indicate all work to be performed under this contract by the parties to this joint venture and the dollar value of each item (on a per-party basis):

Description of Work Item	Party Performed By	$ Value

Total Dollar Value: $_____

(Attach additional pages if needed.)

IF THE BID INVOLVES A JOINT VENTURE OR JOINT VENTURES, THIS FORM MUST BE COMPLETED AND SUBMITTED WITH THE OFFICIAL BID PACKAGE.

II. SECTION 3 PROGRAM REGULATORY REQUIREMENTS (In accordance with 24 CFR 75)

This Contract is subject to the following conditions under Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701u (Section 3).

A. The purpose of Section 3 of the Housing and Urban Development Act of 1968 (12 U.S.C. 1701u - Section 3) is to ensure that employment and other economic opportunities shall be, to the greatest extent feasible, directed to low and very low income persons, particularly those who are recipients of government assistance for housing, and to business concerns which provide economic opportunities to low and very low income persons.

1. Definitions of specific terms are as follows:

a) 1937 Act means the United States Housing Act of 1937, 42 U.S.C. 1437 et seq.

b) Contractor means any entity entering into a contract with:

- A recipient to perform work in connection with the expenditure of public housing financial assistance or for work in connection with a Section 3 project; or
- A subrecipient for work in connection with a Section 3 project.

c) Labor hours means the number of paid hours worked by persons on a Section 3 project or by persons employed with funds that include public housing financial assistance.

d) Low-income person means a person as defined in Section 3(b)(2) of the 1937 Act, which is a person who's annualized income is at or below $43,050 as determined per HUD FY 2021 Income Limits Documentation for Louisville Metro Area.

e) Professional services mean non-construction services that require an advanced degree or professional licensing, including, but not limited to, contracts for legal services, financial consulting, accounting services, environmental assessment, architectural services, and civil engineering services

f) Section 3 Business Concern means:

(1) A business concern meeting at least one of the following criteria, documented within the last six-month period:

(i) It is at least 51 percent owned and controlled by low- or very low-income persons; or

(ii) Over 75 percent of the labor hours performed for the business over the prior three-month period are performed by Section 3 Workers; or

(iii) It is a business at least 51 percent owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.

(2) The status of a Section 3 business concern shall not be negatively affected by a prior arrest or conviction of its owner(s) or employees.

(3) Nothing in this part shall be construed to require the contracting or subcontracting of a Section 3 business concern. Section 3 business concerns are not exempt from meeting the specifications of the contract.

g) Section 3 Worker means:

(1) Any worker who currently fits or when hired within the past five years fit at least one of the following categories, as documented:

(i) The worker's income for the previous or annualized calendar year is below the income limit established by HUD.

(ii) The worker is employed by a Section 3 business concern.

(iii) The worker is a YouthBuild participant.

(2) The status of a Section 3 worker shall not be negatively affected by a prior arrest or conviction.

(3) Nothing in this part shall be construed to require the employment of someone who meets this definition of a Section 3 worker. Section 3 workers are not exempt from meeting the qualifications of the position to be filled.

h) Section 8-assisted housing refers to housing receiving project-based rental assistance or tenant-based assistance under Section 8 of the 1937 Act.

i) Subcontractor: Any entity (other than a person who is an employee of the Contractor) that has a contract with the Contractor to undertake a portion of the Contractor's obligation for the performance of work.

j) Targeted Section 3 Worker means a Section 3 Worker who is:

(1) A worker employed by a Section 3 Business Concern; or

(2) A worker who currently fits or when hired fit at least one of the following categories, as documented within the past five years:

(i) A resident of Louisville Metro Housing Authority or Section 8-assisted housing;

(ii) A resident of other public housing projects or Section 8-assisted housing managed by the PHA that is providing the assistance; or

(iii) A YouthBuild participant.

k) YouthBuild refers to programs receiving assistance under the Workforce Innovation and Opportunity Act (29 U.S.C. 3226).

2. Requirements for Contractors and Subcontractors are as follows:

a) Employment and training.

(1) Consistent with existing Federal, state, and local laws and regulations, contractors, and subcontractors, must make their best efforts to provide employment and training opportunities generated by this project to Section 3 Workers.

(2) Contractors and subcontractors, must make their best efforts described in paragraph (a)(1) of this section in the following order of priority:

(i) To residents of the public housing projects for which the public housing financial assistance is expended;

(ii) To residents of other public housing projects managed by the PHA that is providing the assistance or for residents of Section 8-assisted housing managed by the PHA;

(iii) To participants in YouthBuild programs; and

(iv) To low- and very low-income persons residing within the Louisville Metropolitan Area.

b) Contracting.

(1) Consistent with existing Federal, state, and local laws and regulations, Contractors, and subcontractors, must make their

best efforts to award contracts and subcontracts to business concerns that provide economic opportunities to Section 3 workers.

(2) Contractors and subcontractors, must make their best efforts described in paragraph (b)(1) of this section in the following order of priority:

(i) To Section 3 Business Concerns that provide economic opportunities for residents of the public housing projects for which the assistance is provided;

(ii) To Section 3 Business Concerns that provide economic opportunities for residents of other public housing projects or Section-8 assisted housing managed by the PHA that is providing the assistance;

(iii) To YouthBuild programs; and

(iv) To Section 3 Business Concerns that provide economic opportunities to Section 3 Workers residing within the Louisville Metropolitan Area.

3. Contractor's Safe Harbor:

a) General. LMHA and other recipients will be considered to have complied with requirements in this part, in the absence of evidence to the contrary, if they:

(1) Certify that they have followed the prioritization of effort listed in Section 2 a (2) and 2 b (2); and

(2) Meet or exceed the Section 3 benchmarks as described in paragraph (b) of this section.

b) Benchmarks for the project are as follows:

(1) Twenty-five (25) percent of the labor hours performed on this project shall be by Section 3 Workers as defined in Section 1 (g). The ratio to determine Section 3 Worker labor hours is the number of labor hours worked by Section 3 Workers divided by the total number of labor hours worked by all workers on the project.

$$\frac{\text{Section 3 Labor Hours}}{\text{Total Labor Hours}} = 25\%$$

(2) Five (5) percent of the labor hours performed on this project shall be by Targeted Section 3 Workers as defined in Section 1 (j). The ratio to determine Targeted Section 3 Worker labor hours is the number of labor hours worked by Targeted Section 3 Workers divided by the total number of labor hours worked by all workers on the project.

$$\frac{\text{Targeted Section 3 Labor Hours}}{\text{Total Labor Hours}} = 5\%$$

(3) The Contractor and subcontractors will exclude Professional Services as defined in Section 1 (e), from the total number of labor hours performed on the project.

(4) Contractors and subcontractors may report on the labor hours based on the employer's good faith assessment of the labor hours of a full-time or part-time employee informed by the employer's existing salary or time and attendance-based payroll systems.

c) Reporting of Labor Hours:

(1) Contractors and subcontractors must report to Louisville Metro Housing Authority:

(i) The total number of labor hours worked;

(ii) The total number of labor hours worked by Section 3 Workers; and

(iii) The total number of labor hours worked by Targeted Section 3 Workers.

(2) It is the Bidder's inherent responsibility to determine employees are Section 3 Workers (as per II A 1 (g)) and Targeted Section 3 Workers (as per II A 1 (j)) and must provide documentation upon request.

(3) Section 3 workers' and Targeted Section 3 Workers' labor hours may be counted for five years from when their status as a Section 3 Worker or Targeted Section 3 Worker is established.

(4) Contractors and subcontractors shall submit Labor Hours weekly. Labor Hours may be submitted via certified payroll forms so long as Employees are clearly designated as Non-Section 3 Worker, Section 3 Worker or Targeted Section 3 Worker

B. Employment Demographics Reporting Requirements -- The Contractor and each subcontractor shall complete and submit "Employment Demographics" forms once every month, or more frequently if LMHA so chooses, during the course of the contract.

In completing the forms, the Contractor and each subcontractor shall clearly identify persons newly employed since the last form was submitted (hereafter "New Hires"). The Contractor or subcontractor shall provide the address and telephone number of each New Hire, and shall state whether each New Hire is a Section 3 Worker or Targeted Section Worker. The Contractor shall collect the forms and deliver them to LMHA by the seventh calendar day of each such month. LMHA will provide the Contractor with proper, blank forms at the pre-construction conference, from which the Contractor shall make and distribute copies for its own use and its subcontractors' use. The Contractor's failure to submit a monthly Employment Demographics form, or that of any subcontractor, is ground for termination, for default, of the Contractor's right to proceed with the work.

C. Notice of Job Openings -- The Contractor shall notify LMHA of any and all job openings that arise in the Contractor's company during the course of the Contract. Such notice shall be in writing and mailed, first class, to LMHA via the U.S. Postal Service within two business days after such opening arises. The notice shall describe the minimum qualifications and requirements of the job, the nature of the work, the expected pay rate or range, the place and manner of submitting applications, the name, address and telephone number of the person to contact to obtain an application or additional information, and the date by which applications must be submitted. LMHA will notify its residents of such job openings and encourage qualified residents to submit applications for employment. The Contractor shall, if it receives an application from a qualified LMHA resident, give that application and applicant the same opportunity and consideration for the job as would be given any other, similarly qualified applicant and, if such applicant is the most qualified applicant and there is no bar to employing the applicant, the Contractor shall hire the applicant for the job if it hires anyone for the job. The Contractor's right to proceed with the work may be terminated, for default, upon failure to perform this obligation.

Section 3 Clause

A. Authority. 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) and 24 CFR Part 75. 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. Contracting, Contract Certification and Compliance. 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. Specifically, contracts must be:

(1) Consistent with existing Federal, state, and local laws and regulations, Louisville Metro Housing Authority (LMHA) and other recipients of public housing financial assistance, and their contractors and subcontractors, must make their best efforts to award contracts and subcontracts to business concerns that provide economic opportunities to Section 3 Workers.

(2) LMHA and other recipients, and their contractors and subcontractors, must make their best efforts in the following order of priority:

(a) To Section 3 Business Concerns that provide economic opportunities for residents of the LMHA housing development for which the assistance is provided;

(b) To Section 3 Business Concerns that provide economic opportunities for residents of other LMHA housing developments or Section-8 assisted housing managed by LMHA;

(c) To YouthBuild programs; and

(d) To Section 3 Business Concerns that provide economic opportunities to Section 3 Workers residing within the Louisville Metropolitan area.

C. Notice. 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 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. Subcontracts. 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 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. Employment and Training Opportunities. The contractor will certify that any vacant employment positions, including training positions, that are filled: after the contractor is selected but before the contract is executed, and with persons other than those to whom the regulations of 24 CFR Part 75 require employment opportunities to be directed, were not filled to circumvent the contractor's obligations under 24 CFR Part 75. Specifically, the contract shall be consistent with existing Federal, State, and local laws and regulations. LMHA or other recipients receiving public housing financial assistance, as well as their contractors and subcontractors, must make their best efforts to provide employment and training opportunities generated by the public housing financial assistance to Section 3 Workers. These best efforts must apply to the Section 3 Workers in the following order of priority:

(1) To residents of LMHA housing development for which the public housing financial assistance is expended;

(2) To residents of other LMHA housing developments or for residents of Section 8-assisted housing managed by LMHA;

(3) To participants in YouthBuild programs; and

(4) To low- and very low-income persons residing within the Louisville Metropolitan Area.

F. 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.

END OF SECTION M

SECTION 012000 - PROJECT MEETINGS

PRE-CONSTRUCTION CONFERENCE

Contractor shall be present and accompanied by his project coordinator, job superintendent and all major subcontractors including testing agencies.

PROGRESS MEETINGS

Contractor, subcontractors, material men and vendors whose presence is necessary or requested must attend meetings when called by the Owner or his representatives for purpose of discussing execution of work.

Meetings will be held at a time and place designated by the Owner or his representative.

Decisions, instructions and interpretations given by the Owner or his representative at these meetings, shall be binding and conclusive on the Contractor.

Proceedings of these meetings will be recorded, and Contractor will be furnished one copy for his use. Contractor shall distribute copies to the various subcontractors, material men and vendors involved.

PRE-INSTALLATION MEETINGS

Contractor, subcontractors, material men and vendors whose presence is necessary or requested must attend the meetings for the purpose of discussing execution of work.

Decisions, instructions and interpretations given by the Owner or his representative at these meetings, shall be binding and conclusive on the Contractor.

Proceedings of these meetings will be recorded and Contractor will be furnished one copy for his use. Contractor shall distribute copies to the various subcontractors, material men and vendors involved.

The following pre-installation meetings shall be held prior to start of work, whether noted in the individual specification sections, or not.

1. Demolition/ Abatement
2. Site Work
3. Masonry Tuckpointing
4. Framing
5. Flooring
6. Insulation
7. Drywall
8. Flashing
9. Siding
10. Roofing
11. Miscellaneous blocking
12. Plumbing
13. Electric
14. HVAC

CONTRACT PROGRESS SCHEDULE

Contractor shall be required to complete and submit to the Owner a Contract Progress Schedule within 10 days after Notice to Proceed. This schedule will be required to be reviewed and approved prior to submission of first application for payment.

END OF SECTION

SECTION 013300 – SUBMITTAL PROCEDURES

CONSTRUCTION SCHEDULES

See General Conditions.

PROGRESS REPORTS

Keep progress reports on a daily basis to cover each facet of work. Keep these reports on file at field office and make available for review upon request.

SCHEDULE OF VALUES

Submit schedule of values as required by General Conditions.

PROJECT RECORD DOCUMENTS

Submit project record documents as required by Project Closeout Section.

As-Built drawings are due to PHA within fifteen (15) working days of the completion of construction.

REQUEST FOR INFORMATION (RFI) also referred to as Request for Interpretation (RFI)

A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.

    1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
    2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.

B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:

    1. Project name.
    2. Project number.
    3. Date.
    4. Name of Contractor.
    5. Name of Architect.
    6. RFI number, numbered sequentially.
    7. RFI subject.
    8. Specification Section number and title and related paragraphs, as appropriate.
    9. Drawing number and detail references, as appropriate.
    10. Field dimensions and conditions, as appropriate.
    11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
    12. Contractor's signature.

        a. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other

information necessary to fully describe items Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.

C. Architect's Action: Architect will review each RFI, determine action required, and respond. Allow ten (10) working days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.

1. The following Contractor-generated RFIs will be returned without action:

a. Requests for approval of submittals.
b. Requests for approval of substitutions.
c. Requests for approval of Contractor's means and methods.
d. Requests for coordination information already indicated in the Contract Documents.
e. Requests for adjustments in the Contract Time or the Contract Sum.
f. Requests for interpretation of Architect's actions on submittals.
g. Incomplete RFIs or inaccurately prepared RFIs.

2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.

D. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number. Submit log at each progress meeting.

1. Project name.
2. Name and address of Contractor.
3. Name and address of Architect.
4. RFI number including RFIs that were returned without action or withdrawn.
5. RFI description.
6. Date the RFI was submitted.
7. Date Architect's response was received.
8. Identification of related Minor Change in the Work, Construction Change Directive, and Proposal Request, as appropriate.
9. Identification of related Field Order, Work Change Directive, and Proposal Request, as appropriate.

E. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within five days if Contractor disagrees with response.

OTHER SUBMITTALS

Submit all other information required by Contract Documents.

SUBMITTAL PROCEDURES

A. Coordination: Coordinate preparation and processing of submittals with performance of construction activities. Transmit each submittal sufficiently in advance of performance of related construction activities to avoid delay.

1. Submit shop drawings and samples for all items called for in the specifications.

    a. Submit electronic (email) copy of shop drawing to Architect.
    b. Submit (3) hard copies of each color sample, unless otherwise specified.
    c. Electronic (email) copy of the shop drawing and brochure bearing “final action” stamp of the Architect will be returned to the Contractor.
    d. One printed hardcopy of each drawing and one sample bearing "final action" stamp of the Architect shall be kept at project office and shall be maintained in good condition.
    e. No shop drawing or sample shall be submitted directly to the Architect from a manufacturer, jobber or subcontractor.

2. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.

3. Coordinate transmittal of different types of submittals for related elements of the Work so processing will not be delayed by the need to review submittals concurrently for coordination.

    a. The Architect reserves the right to withhold action on a submittal requiring coordination with other submittals until all related submittals are received.

4. Processing: To avoid the need to delay installation as a result of the time required to process submittals, allow sufficient time for submittal review, including time for resubmittals. Advise the Architect on each submittal, as to whether processing time is critical to the progress of the Work, and if the Work would be expedited if processing time could be reduced.

    a. Allow fourteen (14) working days for initial review. Submittals received by Architect after 1:00 p.m. will be considered as received the following working day. Allow additional time if the Architect must delay processing to permit coordination with subsequent submittals. The Architect will advise the Contractor promptly when it is determined that a submittal being process must be delayed for coordination.
    b. Allow fourteen (14) working days for color selections to be made. Color selections will only be made after ALL materials have been “reviewed” with “no exceptions”.
    c. If an intermediate submittal is necessary, process the same as the initial submittal.
    d. Allow fourteen (14) working days for reprocessing each submittal.
    e. No extension of Contract Time will be authorized because of failure to transmit submittals to the Architect sufficiently in advance of the Work to permit processing.
    f. The Contractor shall pay the Architect a review fee of $300.00 per shop drawing sheet and a review fee of $30.00 per page (letter and legal size) for third and subsequent resubmittals of shop drawings, product data and samples when due to Contractor’s failure to correct previous comments.

        1. Both parties mutually agree that the Owner will have no party to the enforcement or collection of these monetary penalties, and enforcement or collection of these penalties will not cause any delay in the project.

g. Copies of the Contract Documents SHALL NOT be used for submittals.

5. **Color Samples:** Submit physical samples for all items requiring color selections. **Printed and/or paper samples will not be permitted.**

6. Warranties: Where warranties are required for a product and/or trade, a sample warranty (showing compliance with these documents) shall be submitted as part of the shop drawing/ submittal.

7. Qualifications: Where qualifications are required for a trade, qualifications shall be submitted as part of the shop drawing/ submittal.

B. Submittal Preparation: Place a permanent label or title block on each submittal for identification. Indicate the name of the entity that prepared each submittal on the label or title block.

1. Provide a space approximately 4 by 5 inches on the label or beside the title block on Shop Drawings to record the Contractor's review and approval markings and the action taken.

2. Include the following information on the label for processing and recording action taken.

a. Project name.
b. Data.
c. Name and address of the Consultant.
d. Name and address of the Contractor.
e. Name and address of the subcontractor.
f. Name and address of the supplier.
g. Name of the manufacturer.
h. Number and title of appropriate Specification Section.
i. Drawing number and detail references, as appropriate.

3. Provide a space on the label for the Contractor review and approval markings, and a space for the Architect's "Action" marking.

C. Submittal Transmittal: Package each submittal appropriately for transmittal and handling. Transmit each submittal from the Contractor to the Consultant using a transmittal form. The Consultant will not accept submittals received from sources other than the Contractor and will be returned to sender "without action".

1. On the transmittal, record relevant information and requests for data. On the form, or separate sheet, record deviations from Contract Document requirements, including variations and limitations. Include Contractor's certification that information complies with Contract Document requirements.

D. In checking shop drawings and samples, the Architect shall not be required to check dimensions, quantities, electrical characteristics, specific capacities or coordination with other trades, these being Contractor's responsibility.

1. Contractor shall attest, either in writing or by stamp or signature that all shop

drawings and samples submitted for approval have been checked for compliance with Contract Documents prior to submission to the Architect; otherwise, they will be returned **REJECTED.**

2. If sample warranties of items requiring warranties are not included in submittals they will be returned **REJECTED.**

3. Incomplete submittals will be returned **REJECTED.**

E. Stamp on returned shop drawing and samples shall be interpreted as follows:

No Exceptions Taken: No corrections, proceed with work.

Revise and Resubmit: Items unacceptable as submitted, make corrections and resubmit.

Note Markings: Items marked up shall not be fabricated or furnished without incorporation of marks and notes.

Rejected: Item is rejected as not in accordance with contract requirements, or for other justified cause. Submission shall be revised and resubmitted. No item shall be fabricated or furnished under this stamp.

Comments attached: As noted.

CONTRACTOR'S CONSTRUCTION SCHEDULE

A. Bar-Chart Schedule: Prepare a fully developed, horizontal bar-chart-type, contractor's construction schedule. Submit within fifteen (15) working days after the date established for "Commencement of the Work".

1. Provide a separate time bar for each significant abatement, demolition or construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the Work as indicated in the "Schedule of Values".
2. Within each time bar, indicate estimated completion percentage in 10 percent increments. As Work progresses, place a contrasting mark in each bar to indicate Actual Completion.
3. Prepare the schedule on a sheet, or series of sheets, of stable transparency, or other reproducible media, of sufficient width to show data for the entire construction period.
4. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
5. Coordinate the Contractor's Construction Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
6. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for

the Consultant's procedures necessary for certification of Substantial Completion.

B. Work Stages: Indicate important stages of construction for each major portion of the Work, including submittal review, testing, and installation.

C. Area Separations: Provide a separate time bar to identify each major construction area involved in the work. Indicate where each element in an area must be sequenced or integrated with other activities.

D. Cost Correlation: At the head of the schedule, provide a cost correlation line, indicating planned and actual costs. On the line, show dollar volume of work performed as of the dates used for preparation of payment requests.

E. Distribution: Following response to the initial submittal, print and distribute copies to the Consultant, PHA, subcontractors, and other parties required to comply with scheduled dates. Post copies in the Project meeting room and temporary field office.

1. When revisions are made, distribute to the same parties and post in the same location. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in construction activities.

F. Schedule Updating: Revise the schedule after each meeting, event, or activity where revisions have been recognized or made. Issue the updated schedule concurrently with the report of each meeting.

SUBMITTAL SCHEDULE

A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within ten (10) working days of the date required for submittal of the Contractor's Construction Schedule.

1. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's Construction Schedule.
2. Prepare the schedule in chronological order. Provide the following information:

a. Scheduled date for the first submittal.
b. Related Section number.
c. Submittal category (Shop Drawings, Product Data, or Samples).
d. Name of the subcontractor.

END OF SECTION

SECTION 014000 - QUALITY REQUIREMENTS

CODES, STANDARDS AND INDUSTRY SPECIFICATIONS

Material or operations specified by reference to published specifications of a manufacturer, testing agency, society, association or other published standards shall comply with requirements in latest revisions thereof and amendments or supplements thereto in effect on date of Contract Award.

Discrepancies between referenced codes, standards, specifications and Contract Documents shall be brought to the attention of the Architect for interpretation.

Material or work specified by reference to conform to a standard, code, law or regulation shall be governed by Contract Documents when they exceed requirements of such references; referenced standards shall govern when they exceed Contract Documents.

Proof of Compliance

Whenever Contract Documents require that a product be in accordance with Federal Specification, ASTM designation, ANSI specification or other association standard, at the Architect’s request, Contractor shall present an affidavit from manufacturer certifying that product complies therewith. Where requested or specified, submit supporting test data to substantiate. Provide documentation that products comply with the Buy American requirements of the American Reinvestment and Recovery Act.

MANUFACTURER'S DIRECTIONS

Utilize manufactured articles, materials and equipment as directed by manufacturers unless herein specified to contrary. Discrepancy between an installation required by Contract Documents, and manufacturer's instructions and recommendations shall be resolved by the Architect before work may proceed.

LINES AND MEASUREMENTS

Be responsible for properly laying out work and for lines and measurements for the work executed under Contract Documents. Verify figures indicated on Drawings before laying out work and report errors or inaccuracies in writing to the Architect before commencing work. The Architect or their representative will in no case assume responsibility for laying out work.

END OF SECTION

SECTION 015000 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.

1.3 USE CHARGES

A. General: Installation and removal of and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner's construction forces, Architect, occupants of Project**,** testing agencies, and authorities having jurisdiction.

B. Water and Sewer Service from Existing System: Water from Owner's existing water system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

C. Electric Power Service from Existing System: Electric power from Owner's existing system is available for use without metering and without payment of use charges. Provide connections and extensions of services as required for construction operations.

1.4 INFORMATIONAL SUBMITTALS

A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.

1.5 QUALITY ASSURANCE

A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.

B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

PART 2 - PRODUCTS

2.1 TEMPORARY FACILITIES

A. Field Offices, General: Not required.

2.2 EQUIPMENT

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

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

A. General: Install temporary service or connect to existing service.

1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.

B. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.

1. Toilets: Use of Owner's existing toilet facilities **WILL NOT** be permitted.

C. Electric Power Service: Connect to Owner's existing electric power service. Maintain equipment in a condition acceptable to Owner.

D. Parking: parking areas for construction personnel are limited.

E. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.

3.3 SECURITY AND PROTECTION FACILITIES INSTALLATION

A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.

B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

C. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.

D. Temporary Egress: Maintain temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction.

E. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.

1. Prohibit smoking in construction areas.
2. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.4 OPERATION, TERMINATION, AND REMOVAL

A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.

B. Maintenance: Maintain facilities in good operating condition until removal.

END OF SECTION

SECTION 016000 – PRODUCT REQUIREMENTS

RELATED DOCUMENTS

General provisions of Contract, General and Supplementary Conditions and General Requirements apply to this Section.

TRANSPORTATION

Materials, products and equipment shall be properly containerized, packaged, boxed and protected to prevent damage during transportation and handling. More detailed requirements for transportation and handling are specified under technical sections.

STORAGE AND PROTECTION

Store and protect materials delivered at site from damage. Do not use damaged material on work.

IDENTIFYING MARKINGS

All fire rating labels and product certifications are to remain intact on the material.

MEASUREMENTS

All Contractors furnishing materials and equipment for this contract shall obtain exact dimensions at site.

Scale and figure dimensions on Drawings indicate correct size under ideal conditions and shall not under any circumstances be so construed as to relieve Contractor from responsibility of taking measurements at site and furnishing materials and equipment of correct size.

PRODUCT APPROVAL STANDARDS

Term "product" shall include material, equipment, assembly methods, manufacturer, brand, trade name or other description.

Manufacturers

Wherever manufacturers and products are listed in Contract Documents they shall establish required quality. Products, which are equal in quality, suited to same use and are capable of performing same function, as those names will be acceptable. Burden of proof of equal quality or service shall be on Contractor.

Proof of inequality is not implied by Specifications and is not a burden of the Owner. His duty shall be to properly weigh proven facts of equality in fairness to all parties involved.

Inclusion of a certain make or type of material or equipment in Contractor's bid or estimate shall not obligate Owner to accept such material or equipment if it does not meet requirements of Contract Documents. The Owner will advise Contractor of acceptance and approval thereof, and of action to be taken.

If an item of material or equipment, or manufacturer, is specifically specified to have no approved equal, it shall be provided and no substitution will be entertained or allowed unless otherwise determined by the Owner.

SUBSTITUTIONS

Inclusion in Specifications of Non-specified Products Prior to Bid Date:

For inclusion of products other than those specified, does not require prior approval. Manufacturers listed in the specifications are used to establish a level of quality. Other manufacturers may be acceptable provided the product complies with the Construction Documents. Burden of proof shall be the bidder's responsibility.

Substitutions After Award of Contract

Substitution of products will be considered only under one of the following conditions:

When specified product is not available, a proposed substitution will not be considered unless proof is submitted within forty-five (45) days after contract is signed that firm orders were placed within ten (10) days after contract signing or unavailability is due to a strike, lockout, bankruptcy, discontinuance of manufacturer of a product or natural disasters.

When a guarantee of performance is required, and in judgment of Contractor, specified product or process will not produce desired results.

Make request for such substitutions in writing to within ten days of date that Contractor ascertains he cannot obtain product specified or that performance cannot be guaranteed.

Procedure Respecting Substitutions Prior to or After Bid Date

Should Contractor wish to substitute some product other than one previously approved, he shall request permission, in writing, from the Architect, giving the following information in his letter of request:

Name and manufacturer of product specified.

Name and manufacturer of product he wishes to substitute.

Complete descriptive and specification data and illustrations and samples of product he wishes to substitute and reasons for substitutions.

In consideration of proposed substitutions, Contractor shall supply the Architect with all information, which may be requested.

The Architect will approve or disapprove proposed substitution in writing and his decision will be final if within provisions of contract documents.

END OF SECTION

SECTION 016110 - VOLATILE ORGANIC COMPOUND (VOC) CONTENT RESTRICTIONS

PART 1 – GENERAL

1.1 SECTION INCLUDES

A. VOC restrictions for product categories listed below under "DEFINITIONS."

B. All products of each category that are installed in the project must comply; Owner's project goals do not allow for partial compliance.

1.2 DEFINITIONS

A. VOC-Restricted Products: All products of each of the following categories when installed or applied on-site in the building interior:

1. Adhesives, sealants, and sealer coatings.
2. Carpet.
3. Paints and coatings.
4. Composite wood and agrifiber products used either alone or as part of another product.
5. Other products when specifically stated in the specifications.

B. Interior of Building: Anywhere inside the exterior weather barrier.

C. Adhesives: All gunnable, trowelable, liquid-applied, and aerosol adhesives, whether specified or not; including flooring adhesives, resilient base adhesives, and pipe jointing adhesives.

D. Sealants: All gunnable, trowelable, and liquid-applied joint sealants and sealant primers, whether specified or not; including firestopping sealants and duct joint sealers.

1.4 REFERENCE STANDARDS

A. CAL (CHPS LEM) - Low-Emitting Materials Product List; California Collaborative for High Performance Schools (CHPS); current edition at www.chps.net/.

B. CAL (VOC) - Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers (including Addendum 2004-01); State of California Department of Health Services; 2004.

C. CRI (GLCC) - Green Label Testing Program - Approved Product Categories for Carpet Cushion; Carpet and Rug Institute; Current Edition.

D. CRI (GLP) - Green Label Plus Carpet Testing Program - Approved Products; Carpet and Rug Institute; Current Edition.

F. GreenSeal GS-36 - Commercial Adhesives; Green Seal, Inc.; 2000.

G. GreenSeal GS-11 – Paints and Coatings; Green Seal, Inc.; 2000

H. GreenSeal GC-03 - Anti Corrosive and anti rust paints; Green Seal, Inc.; 2000.

I. SCAQMD 1113 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

J. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168; current edition; www.aqmd.gov.

H. SCS (CPD) - SCS Certified Products; Scientific Certification Systems; current listings at www.scscertified.com.

1.5 SUBMITTALS

A. Evidence of Compliance: Submit for each different product in each applicable category.

B. Product Data: For each VOC-restricted product used in the project, submit product data showing compliance, except when another type of evidence of compliance is required. Submittals should include:

a. Manufacturer's Product Data- including name and model

b. VOC content in g/L (or % for aerosol adhesives)

c. Source of VOC data

d. Which standard is met, and allowable VOC content, if applicable.

e. Confirmation that the product contains no added urea-formaldehyde

1.6 QUALITY ASSURANCE

A. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 – PRODUCTS

2.1 MATERIALS

A. All VOC-Restricted Products: Provide products having VOC content of types and volume not greater than those specified in State of California Department of Health Services Standard Practice for the Testing of Volatile Organic Emissions From Various Sources Using Small-Scale Environmental Chambers.

1. Evidence of Compliance: Acceptable types of evidence are:

a. Current Green Seal Standard, www.greenseal.org
b. Current Carpet and Rug Institute Green Label and Green Label Plus certification; www.carpet-rug.org.
c. Current SCS Floorscore certification; www.scscertified.com.
d. Current SCS Indoor Advantage Gold certification; www.scscertified.com.
e. Current SCAQMD Rule 1113 compliance.

2. Do not use composite wood or agrifiber products or adhesives that contain urea-formaldehyde resin.

PART 3 – EXECUTION

3.1 FIELD QUALITY CONTROL

A. Owner reserves the right to reject non-compliant products, whether installed or not, and require their removal and replacement with compliant products at no extra cost to Owner.

B. All additional costs to restore indoor air quality due to installation of non-compliant products will be borne by Contractor.

3.2 SCHEDULE

A. All interior paints and primers must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by South Coast Air Quality Management District (SCAQMD) Rule 1113. Projects must follow the most recent revision available at time of product specification. For the latest rules: www.aqmd.gov/home/regulations/rules.

PAINT TYPE	**MAXIMUM VOC LIMIT**
Primers and sealers	100 g/L
Coatings, flats and non-flats	50 g/L
Opaque floor coatings	50 g/L
Rust preventative coatings	100 g/L
Clear wood finishes	275 g/L

B. All adhesives and sealants (including caulks) must have volatile organic compound (VOC) levels, in grams per liter, less than or equal to the thresholds established by the South Coast Air Quality Management District (SCAQMD) Rule 1168. Projects must follow the most recent revision available at time of product specification. For the latest rules: www.aqmd.gov/home/regulations/rules

VOC LIMIT PRODUCT TYPE	(G / L)
Indoor carpet adhesives	50
Carpet pad adhesives	50
Outdoor carpet adhesives	150
Wood flooring adhesives	100
Rubber floor adhesives	60
Subfloor adhesives	50
Ceramic tile adhesives	65
VCT and asphalt tile adhesives	50
Drywall and panel adhesives	50
Cove base adhesives	50
Multipurpose construction adhesives	70
Structural glazing adhesives	100
Single-ply roof membrane adhesives	250
Structural wood member adhesive	140
Architectural sealants, including caulk	250

END OF SECTION

SECTION 017300 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:

1. Installation of the Work.
2. Cutting and patching.
3. Progress cleaning.
4. Starting and adjusting.
5. Protection of installed construction.

1.3 DEFINITIONS

A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.

B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 PREINSTALLATION MEETINGS

A. Cutting and Patching Conference: Conduct conference at Project site.

1. Prior commencing work requiring cutting and patching, review extent of cutting and patching anticipated and examine procedures for ensuring satisfactory result from cutting and patching work. Require representatives of each entity directly concerned with cutting and patching to attend, including the following:

a. Contractor's superintendent.
b. Trade supervisor responsible for cutting operations.
c. Trade supervisor(s) responsible for patching of each type of substrate.
d. Subcontractors' supervisors, to the extent each trade is affecting by cutting and patching operations.

2. Review areas of potential interference and conflict. Coordinate procedures and resolve potential conflicts before proceeding.

1.5 INFORMATIONAL SUBMITTALS

A. Cutting and Patching Plan: Submit plan describing procedures at least [**10**] days prior to the time cutting and patching will be performed. Include the following information:

1. Extent: Describe reason for and extent of each occurrence of cutting and patching.
2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building appearance and other significant visual elements.
3. Products: List products to be used for patching and firms or entities that will perform patching work.
4. Dates: Indicate when cutting and patching will be performed.
5. Utilities and Mechanical and Electrical Systems: List services and systems that cutting and patching procedures will disturb or affect. List services and systems that will be relocated and those that will be temporarily out of service. Indicate length of time permanent services and systems will be disrupted.

1.6 QUALITY ASSURANCE

A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. Structural Elements: When cutting and patching structural elements, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:

    a. Primary operational systems and equipment.
    b. Fire separation assemblies.
    c. Air or smoke barriers.
    d. Fire-suppression systems.
    e. Plumbing piping systems.
    f. Mechanical systems piping and ducts.
    g. Control systems.
    h. Communication systems.
    i. Fire-detection and -alarm systems.
    j. Conveying systems.
    k. Electrical wiring systems.
    l. Operating systems of special construction.

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in

increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:

a. Water, moisture, or vapor barriers.
b. Membranes and flashings.
c. Exterior curtain-wall construction.
d. Sprayed fire-resistive material.
e. Equipment supports.
f. Piping, ductwork, vessels, and equipment.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

B. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

A. General: Comply with requirements specified in other Sections.

1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with sustainable design requirements.

B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.

1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Existing Conditions: The existence and location of construction indicated as existing is not guaranteed. Before beginning, investigate and verify the existence and location of construction affecting the Work.

B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator

present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.

1. Examine roughing-in for systems to verify actual locations of connections before equipment and fixture installation.
2. Examine walls, floors, etc., for suitable conditions where products and systems are to be installed.
3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.

C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

A. 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.

B. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

C. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents caused by differing field conditions outside the control of Contractor, submit a request for information to Architect.

3.3 INSTALLATION

A. General: 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 wiring in finished areas unless otherwise indicated.

B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.

C. 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.

3.4 CUTTING AND PATCHING

A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.

1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

C. Temporary Support: Provide temporary support of work to be cut.

D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

E. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
3. Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
4. Proceed with patching after construction operations requiring cutting are complete.

F. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.

1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing.
3. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.

4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.

G. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.5 PROGRESS CLEANING

A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

B. Site: Maintain Project site free of waste materials and debris.

C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1. Remove liquid spills promptly.
2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.

D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 017419 "Construction Waste Management and Disposal."

H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.6 STARTING AND ADJUSTING

A. Coordinate startup and adjusting of equipment and operating components with Owner and Architect.

B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.

C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.

D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.7 PROTECTION OF INSTALLED CONSTRUCTION

A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Final Completion.

B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

C. Comply with manufacturer's written instructions for temperature and relative humidity.

END OF SECTION

SECTION 017419 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for the following:

1. Recycling nonhazardous demolition waste.
2. Disposing of nonhazardous demolition waste.

1.3 DEFINITIONS

A. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.

B. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.

C. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.

D. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.

1.4 PERFORMANCE REQUIREMENTS

A. General: Practice efficient waste management in the use of materials in the course of the Work. Use all reasonable means to divert construction and demolition waste from landfills and incinerators. Facilitate recycling and materials, including the following:

1. Demolition Waste: (As Applicable)

a. Asphaltic concrete paving.
b. Concrete.
c. Concrete reinforcing steel.
d. Brick.
e. Concrete masonry units.

f. Wood studs.
g. Wood joists.
h. Plywood and similar wood sheathing.
i. Wood trim.
j. Structural and miscellaneous steel.
k. Rough hardware.
l. Roofing.
m. Insulation.
n. Doors and frames.
o. Door hardware.
p. Gypsum board.
q. Carpet and pad.
r. Equipment.
s. Cabinets.
t. Plumbing fixtures.
u. Piping.
v. Supports and hangers.
w. Mechanical equipment.
x. Electrical conduit.
y. Copper wiring.
z. Lighting fixtures.
aa. Lamps.
bb. Ballasts.
cc. Electrical devices.
dd. Switchgear and panelboards.

2. Construction Waste:

a. Packaging: Regardless of recycle goal indicated in paragraph above, recycle 100 percent of the following uncontaminated packaging materials:

1) Paper.
2) Cardboard.
3) Boxes.
4) Plastic sheet and film.
5) Polystyrene packaging.
6) Wood crates.
7) Plastic pails.

1.5 ACTION SUBMITTALS

A. Waste Management Plan: Submit plan within 15 days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

A. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

B. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.

1.7 QUALITY ASSURANCE

A. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Waste Management Conference: Conduct conference to review methods and procedures related to waste management including, but not limited to, the following:

1. Review and discuss waste management plan.
2. Review requirements for documenting quantities of each type of waste and its disposition.
3. Review and finalize procedures for materials separation and verify availability of containers and bins needed to avoid delays.
4. Review procedures for periodic waste collection and transportation to recycling and disposal facilities.
5. Review waste management requirements for each trade.

1.8 WASTE MANAGEMENT PLAN

A. General: Develop a waste management plan. Plan shall consist of waste identification, waste reduction work plan. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.

B. Waste Identification: Indicate anticipated types and quantities of waste generated by the Work. Include estimated quantities and assumptions for estimates.

C. Waste Reduction Work Plan: List each type of waste and whether it will be recycled, or disposed of in landfill or incinerator

1. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
2. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.

B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work occurring at Project site.

1. Distribute waste management plan to everyone concerned within three days of submittal return.
2. Review plan procedures and locations established for recycling, and disposal.

C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.

3.2 RECYCLING WASTE, GENERAL

A. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Contractor.

B. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.

C. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan.

1. Provide appropriately marked containers or bins for controlling recyclable waste until they are removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.

a. Inspect containers and bins for contamination and remove contaminated materials if found.

2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.

3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
4. Store components off the ground and protect from the weather.
5. Remove ALL waste off Owner's property and transport to recycling receiver or processor.

3.3 DISPOSAL OF WASTE

A. General: Except for items or materials to be recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Transport waste materials off Owner's property and legally dispose of them.

END OF SECTION

SECTION 017700 – CLOSEOUT PROCEDURES

RELATED DOCUMENTS

General provisions of the Contract, and General and Supplementary Conditions and General Requirements apply to this Section.

This Section shall be governed by alternates insofar as they affect this work.

CLEANING UP

Keep site free of combustible materials.

Do not dump debris, waste and excess earth on other property without prior permission of property owner.

Burning of waste materials on site will not be permitted.

Upon completion of work, remove temporary buildings and structures, fences, scaffolding, surplus materials, equipment and rubbish of every kind from site of work.

DOCUMENTS REQUIRED PRIOR TO FINAL PAYMENT

Prior to final payment and before issuance of a final certificate of payment in accordance with provisions of General Conditions, file the following papers with the Owner.

Warranties:

Three (3) copies of warranty required by General Conditions and other extended warranties stated in technical specification sections shall be bound and submitted in a 3-ring binder.

Release of Waiver of Liens:

Provide Release of Waiver of Liens for each subcontractor, trade and vendor.

Project Record Documents:

As work progresses, keep a complete and accurate record of all changes or deviations from Contract Documents including all addenda items. Changes shall be neatly and correctly indicated on respective portion of affected document, using blackline or blueline prints of Drawings affected or Project Manual with appropriate supplementary notes. This record set Drawings and Project Manual shall be kept at job site for inspection by Architect, Owner or their representatives.

The record drawings shall not be used as a construction set.

All Addenda, Architect's Supplemental Instructions, Field Orders and Change Orders issued for this project shall be included in the Record Drawings.

Records above shall be arranged in order in accordance with various sections of

specifications and properly indexed. At completion of work, certify by endorsement thereof that each of revised prints of Drawings and Project Manual is complete and accurate. Prior to application for final payment, and as a condition to its approval by Owner, deliver Record Documents, arranged in proper order, indexed and endorsed as herein before specified. Provide suitable transfer cases and deliver records therein, indexed and marked for each division of work for the following:

A full set of shop drawings bearing the Architect's stamp

Contract Drawings

Project Manual (specifications) - Highlight or otherwise note each specific product used in this project, for each section of project manual.

Change Order drawings and field changes – place on back of previous drawing sheet in record drawings.

No review or receipt of such records by Owner shall be a waiver of any deviation from Contract Documents or shop drawings or in any way relieve Contractor from his responsibility to perform work in accordance with Contract Documents and shop drawings to extent they are in accordance with Contract Documents.

Certificate of Final Completion

Provide Release of Surety, as required by General Conditions

Operating and maintenance manuals to include the following information:

1. Each Contractor shall compile product data related to the maintenance and operation of products and equipment provided under the Contract. Provide O & M information for products specified in schedules and specific work sections of the Project Manual.

   Prepare a typewritten table of contents for each volume, arranged in project manual order. Include for each product, the name, address and telephone number of subcontractor, maintenance contractor and parts vendor.

   Supplement product data with drawings to clearly illustrate the relationship of component parts and control and flow diagrams.

   Include a copy of each warranty, bond and service agreement.

2. Submit 3 copies of each manual.

3. For Materials and Finishes: Provide full information on products, including catalog number, size, composition, color and texture designations and information for reordering special-manufactured products.

   Provide manufacturer's recommendations for cleaning agents/methods and recommended cleaning and maintenance schedules.

4. For Equipment and Systems: Provide operating characteristics and limiting conditions,

performance curves, engineering data and tests.

Include operating procedures, start-up, break-in, routine and normal operating instructions; regulation, control, stopping, shutdown and emergency instructions; summer and winter operating instructions, maintenance procedures; servicing and lubrication schedules.

Provide manufacturer's operating and maintenance instructions; sequence of operation by control manufacturer, manufacturer's parts list, illustrations, assembly drawings and diagrams for maintenance, predicted life expectancy of parts subject to wear, recommended spare parts.

END OF SECTION

ASBESTOS CONTAINING MATERIALS INSPECTION & HAZARDOUS MATERIALS INSPECTION

2700 – 2714 Holly Park Drive
Louisville, Kentucky 40214

Prepared for:

Sherman, Carter, Barnhart PSC
2405 Harrodsburg Road
Lexington, Kentucky 40504

&

Louisville Metro Housing Authority
420 South Eighth Street
Louisville, Kentucky 40203

Prepared by:

TriEco, LLC
7710 Springvale Drive, Suite 201
Louisville, Kentucky 40241-2745
TriEco Project No. 210325-G

Report Date: May 21, 2021

Table of Contents

1.0 ASBESTOS INSPECTION

1.1 INTRODUCTION

TriEco, LLC (TriEco) was authorized on behalf of the Sherman Carter Barnhart, PSC (Sherman, Carter, Barnhart), in a work order authorized by Mr. Tom Smith on April 15, 2021 to perform an asbestos containing materials (ACM) inspection, as part of the environmental screening inspection, to assess potential environmental concerns associated with asbestos at the apartment complex at 2700-2714 Holly Park Drive Louisville, Jefferson County, Kentucky. TriEco has prepared this report for use by Sherman, Carter, Barnhart, and their client the Louisville Metro Housing Authority (LMHA), to outline identified environmental concerns associated with asbestos at this property prior to renovation activities.

The subject site includes forty-four two-bedroom apartments and a maintenance office within eight multi-unit structures located at 2700, 2702, 2704, 2706, 2708, 2710, 2712, and 2714 Holly Park Drive in Louisville, Kentucky. The subject site is situated south of the Stephan Road and North of Terudon Drive between Manslick Road to the east and Vista John Drive to the west. The site consists of approximately 8-acres in Louisville, Jefferson County, Kentucky. The subject site is located approximately 7 miles south of downtown Louisville. This inspection report provides background information, scope-of-work performed, limitations and exceptions, assessment results, findings and conclusions, and recommendations. Selected site photographs are included within Appendix A.

The objective of this project was to collect material that would assist in the identification of ACM which may be disturbed during renovation activities. All inspection and sampling activities were conducted in accordance with the National Emissions Standard for Hazardous Air Pollutants (NESHAP) General Inspection Procedures found within 40 CFR 61, Subpart M. Historic record reviews and owner/operator questionnaires were not part of this assessment. All on-site assessment activities were conducted on May 7, 2021. A comprehensive list of all samples taken from the subject property can be found in Appendix B.

1.2 BACKGROUND AND SITE SUMMARY

Sherman, Carter, Barnhart has requested this asbestos inspection, as part of the environmental screening inspection, to be included as a component of the preparatory activities prior to the renovation of the subject building. The property located at 2700-2714 Holly Park Drive. The property is located south of downtown Louisville, KY in a developed residential and commercial area. The assessed structures are two-story, multi-family residences of wood frame construction, consisting of a combination of brick and vinyl siding veneer, asphalt shingled, gabled roofing systems, and crawl spaces areas. Sample location diagrams are included within Appendix C.

Asbestos is a general term for a group of fibrous minerals (primarily chrysotile, amosite, and crocidolite) that have long been used as a fireproof insulation and as a strengthener in pipe insulation, roofing tiles, floor tiles, mastic, wall coverings, and other materials. Undisturbed ACMs are not dangerous. However, when ACMs are broken or torn (such as during remodeling or demolition) the fibers can be spread into the air, especially if the material is friable. A material is considered an ACM if it is found to contain greater than 1% of asbestos. Studies have shown

that inhaling high concentrations of these fibers over time can cause diseases such as asbestosis, lung cancer, and mesothelioma.

1.3 LIMITATIONS AND EXCEPTIONS

This assessment pertains directly to those areas observed and sampled within the subject property and is not intended to provide indoor air quality data or information for the entirety of the structure.

None of the work performed hereunder shall constitute or be represented as a legal opinion of any kind or nature, but shall be a representation of findings from the site visits. There are no warranties or guarantees, expressed or implied, included or intended by the report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by professional consultants or firms performing the same or similar service.

Changes in the condition of the building may occur with time due to either natural processes or human activities. The findings presented in this report are based on site conditions existing at the time of the investigations. The potential exists for ACM to be present in areas that may not be revealed until renovation activities begin. During renovation activities, if potential ACM materials are discovered that are not identified within this report, those materials should be sampled by a licensed inspector, analyzed by an accredited laboratory, and removed accordingly.

This report was compiled for the sole use of Sherman, Carter Barnhart and their client the LMHA. This report is not intended to be distributed or relied upon by third parties without the written permission of TriEco. The Louisville Metro Air Pollution Control District requires all asbestos containing materials be removed prior to demolition or renovation regardless of friability or quantity. Therefore, any exemptions for abatement based on friability or reportable quantities are not applicable to demolition in the Louisville Metropolitan Area.

1.4 SCOPE OF WORK

TriEco performed the following scope-of-work, which was based, in part, upon information provided by persons deemed knowledgeable of the property and our experience with similar projects.

All on-site assessment activities were conducted on May 7, 2021. The survey was performed to assess potential ACM associated with building's interior, exterior, and roofing system. Christopher Stovall and Gregory Bailey, Kentucky accredited asbestos inspectors, conducted the survey activities. A copy of TriEco's Kentucky credentials are included in Appendix D.

Samples of potential ACM were collected from homogeneous areas, which consisted of materials that were similar in color, texture, and size. The suspect ACM samples were delivered to San Air Laboratory, Inc (San Air) of Powhatan, Virginia for Polarized Light Microscopy (PLM) analysis under chain of custody protocols. The National Voluntary Laboratory Accreditation Program (NVLAP) accredits San Air for Asbestos Fiber Analysis.

1.5 RESULTS

None of the sampled materials yielded a positive result for the presence of asbestos. A comprehensive list of all samples taken from the subject property can be found in Appendix B. Asbestos sample location diagrams are included as Appendix C. A copy of the SanAir analytical results for the ACM assessment is included in Appendix E.

1.6 FINDINGS AND CONCLUSIONS

TriEco has performed this assessment for ACM in accordance with the scope of services as defined in this report. Our assessment has revealed the following:

- ACM was not indicated within any of the materials sampled.

1.7 RECOMMENDATIONS

Based upon the results of this focused assessment, TriEco recommends the following:

- Should potential ACMs be discovered during renovation activities that have not previously been sampled, all renovation activities which disturb the potential ACM should cease until the material(s) have been sampled. If asbestos is discovered during renovation activities, appropriate asbestos abatement should occur in accordance with federal, state, and local regulations.

2.0 HAZARDOUS MATERIALS INSPECTION

2.1 BACKGROUND AND SITE SUMMARY

TriEco, LLC (TriEco) was authorized on behalf of the Sherman Carter Barnhart, PSC (Sherman, Carter, Barnhart), in a work order authorized by Mr. Tom Smith on April 15, 2021 to perform a hazardous materials inspection, as part of the environmental screening inspection, to assess potential environmental concerns 2700-2714 Holly Park Drive Louisville, Jefferson County, Kentucky. TriEco has prepared this report for use by Sherman, Carter, Barnhart, and their client the Louisville Metro Housing Authority (LMHA), to outline identified environmental concerns at this property prior to renovation activities.

The objective of this project was to identify regulated materials that may have an environmental impact to the property during and following the renovation. This assessment included an inspection for previously unidentified environmental concerns that may be disturbed during the renovation activities. Any environmental concerns identified within this report are based on visual observations present at the time of this assessment.

2.2 LIMITATIONS AND EXCEPTIONS

This inspection pertains directly to those areas observed within the subject property and conclusions and recommendations of this report are based solely upon the conditions present at the facility during the sampling period. Only those areas accessible during the site visits, including living areas considered 'typical' of those conditions and materials found throughout the property structure were observed. Testing for polychlorinated biphenyls (PCBs) within caulking testing was not performed as part of this inspection. No recommendations regarding the potential for PCBs in caulk will be included.

None of the work performed hereunder shall constitute or be represented as a legal opinion of any kind or nature, but shall be a representation of findings from the site visits. There are no warranties or guarantees, expressed or implied, included or intended by this report, except that it has been prepared in accordance with the current generally accepted practices and standards consistent with the level of care and skill exercised under similar circumstances by professional consultants or firms performing the same or similar services.

Changes in the condition of building may occur with time, due to either natural processes or human activities. The findings presented in this report are based on site conditions existing at the time of the investigations.

This report was compiled for the sole use of Sherman Carter Barnhart and their client the LMHA. This report in not intended to be distributed or relied upon by third parties without the written permission of TriEco.

2.3 SCOPE OF WORK

This hazardous materials inspection was conducted by TriEco personnel at 2700-2714 Holly Park Drive in Louisville, Jefferson County, Kentucky which is scheduled for major renovation. The purpose of the site investigation was to visually inspect areas of the subject buildings for any regulated potential environmental concerns in addition to asbestos containing materials. Additional testing may be deemed necessary if waste characterization is required. Accessible areas were inspected by TriEco personnel for the presence of the following hazardous materials:

- Materials and equipment potentially containing polychlorinated biphenyls (PCBs) including transformers, capacitors, oil containing circuit breakers, and light ballasts (this does not include sealants or caulks);

- Materials and equipment potentially containing mercury including thermostats, thermometers, switches, relays, and high intensity lights;

- Equipment potentially containing radioactive materials including exit signs, smoke detectors, and controls;

- Materials and equipment potentially containing used oils including HVAC systems and elevators;

- Equipment potentially containing Chlorofluorocarbons (CFCs) and Hydrochlorofluorocarbons (HCFCs) including components associated with the HVAC system and other cooling equipment; and

- Other potentially hazardous materials including: spent cleaning solvents, paints, and batteries.

2.4 RESULTS

The investigation yielded the following results:

- Multiple small containers, including quart and gallon paint containers were found within the maintenance of the subject property;

- Smoke detectors were found within the subject building that may contain a small amount of radioactive material;

- HVAC systems were found throughout the property that contain various refrigerants (Chlorofluorocarbon; **(CFCs)**) and/or other harmful chemicals;

- Compact fluorescent (CFL) light bulbs were found within each subject unit, (5-10 per unit), that contain a small amount of Mercury Vapor;

- Refrigerators were found within each unit that contain various refrigerants (Chlorofluorocarbon; **(CFCs)**) and/or other harmful chemicals

2.5 CONCLUSIONS AND RECOMMENDATIONS

- Since the subject building is slated to be renovated; the segregation, characterization, removal and proper disposal of the aforementioned items must occur in accordance with all applicable local, state, and federal regulations. The selected contractor must be trained to segregate, characterize, handle, transport, and dispose of the materials.

- If any additional materials are found during renovation activities that are thought to possibly be hazardous, asbestos containing, or otherwise indefinable, all work should cease until all materials are sampled and properly disposed of if necessary.

- All contractors and employees should be alerted to the presence and location of the identified and presumed hazards, in accordance with applicable Occupational and Safety Health Administration (OSHA) regulations.

- If applicable, various regulatory agencies (state and local) must be notified of any work prior to conducting said work. The licensed contractor typically submits these notifications.

- Employees who work with hazardous materials should be provided with proper personal protective equipment, as well as the appropriate removal equipment, training and licensure as applicable.

- All hazardous materials must be disposed of in accordance with the Federal, State and Local regulations.

- Removal of hazardous materials should be monitored to ensure that no hazardous material is released into the environment.

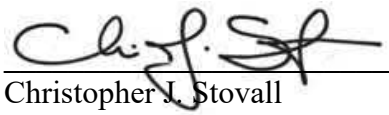
- A standardized specification for hazardous materials removal should be established for the removal of hazardous materials identified at the referenced property. It is recommend that the specification address important issues including an accurate scope of work, regulatory requirements, insurance requirements, notification procedures, air sampling requirements and other pertinent information.

- If renovations to any areas outside of Sherman, Carter, Barnhart's or the LMHA's project scope is planned, it will be necessary to further investigate the areas in order to confirm the presence or absence of hazardous materials.

Implementation of these recommendations will help ensure compliance with regulatory requirements.

3.0 SIGNATURES AND QUALIFICATIONS OF ENVIRONMENTAL PROFESSIONALS

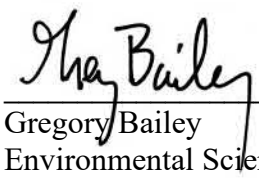
Prepared by:



5/21/2021

Christopher J. Stovall — Date
Environmental Scientist

Qualifications: Mr. Stovall is an Environmental Site Supervisor for TriEco and has more than eleven years of environmental consulting and remediation experience. Mr. Stovall holds a bachelor's degree in Environmental Health Science from Eastern Kentucky University. Mr. Stovall's experience includes the characterization, profiling, coordination, and disposal of hazardous and nonhazardous waste. Mr. Stovall serves as one of TriEco's main site supervisors for oversight related to various local and governmental consulting contracts, and has experience managing soil, water, asbestos, and mold remediation projects



5/21/2021

Gregory Bailey — Date
Environmental Scientist

Mr. Bailey is an Environmental Site Supervisor for TriEco and has more than eleven years of environmental management, industrial hygiene and remediation experience. Mr. Bailey holds a Bachelor's degree in Environmental Science and Industrial Hygiene from Western Kentucky University. Mr. Bailey is a Kentucky Accredited Asbestos Inspector and Lead Hazard Risk Assessor with additional experience including characterization, profiling, coordination, and disposal of hazardous and nonhazardous waste. Mr. Bailey has experience performing Phase I and Phase II Environmental Site Assessments as well as managing soil, lead, asbestos, mold and infectious microbial remediation projects.

5.0 REFERENCES

Asbestos Hazard Emergency Response Act (AHERA). 40 CFR, Part 763.

Louisville Metro Air Pollution Contract District (LMAPCD). Regulation 5.04, Adoption of Federal Emission Standard for Asbestos. Regulation 5.13 Additional Control Standards for Asbestos Removal.

LMAPCD. Regulation 2.03, Permit Requirement for Non-Title V Construction and Operating Permits and Demolition/Renovation Permits.

National Emission Standards for Hazardous Air Pollutants: Asbestos (NESHAP). 40 CFR Part 61.

Occupational Safety and Health Administration (OSHA). Occupations Exposure to Asbestos: Final Rule, 29 CFR Parts 1910 and 1926.

USEPA Asbestos NESHAP Clarification Regarding Analysis of Multi-Layered Systems.

OSHA. 29 CFR Parts 1910.1025.

5.0 APPENDICES

5.1 Appendix A: Site Location Figure & Selected Site Photographs
5.2 Appendix B: Asbestos Field Sample Logs
5.3 Appendix C: Asbestos Sample Location Diagrams
5.4 Appendix D: Asbestos License and Certifications
5.5 Appendix E: Asbestos Laboratory Analytical Results

APPENDIX A

SITE LOCATION FIGURE AND SELECTED SITE PHOTOGRAPHS

N	Figure 1	**Site Location Figure** 2700-2714 Holly Park Drive
		May 2021

1	DESCRIPTION	View of side A of 2704. 2706 & 2708 Holly Park Drive looking southwest.
	DATE	May 7, 2021

2	DESCRIPTION	View of side A of 2710 Holly Park Drive looking northwest.
	DATE	May 7, 2021

3	DESCRIPTION	View of side C of 2711 Holly Park Drive looking west .
	DATE	May 7, 2021

4	DESCRIPTION	View of side C of 2704 Holly Park Drive looking north.
	DATE	May 7, 2021

5	DESCRIPTION	Exterior view of the maintenance office at 2714 Holly Park Drive looking southwest.
	DATE	May 7, 2021

6	DESCRIPTION	View of the flashing on the roof of 2714 Holly Park Drive..
	DATE	May 7, 2021

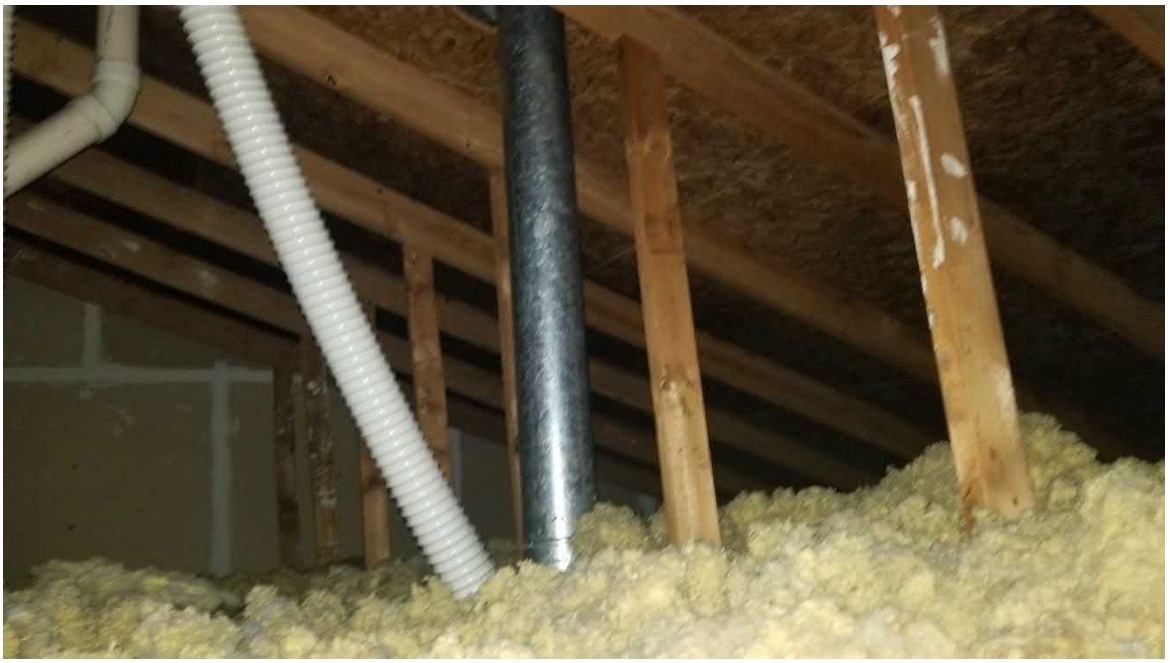
7	DESCRIPTION	View of a vent penetration on the roof of 2712 Holly Park Drive.
	DATE	May 7, 2021

8	DESCRIPTION	View of a vent penetration on the roof of 2712 Holly Park Drive.
	DATE	May 7, 2021

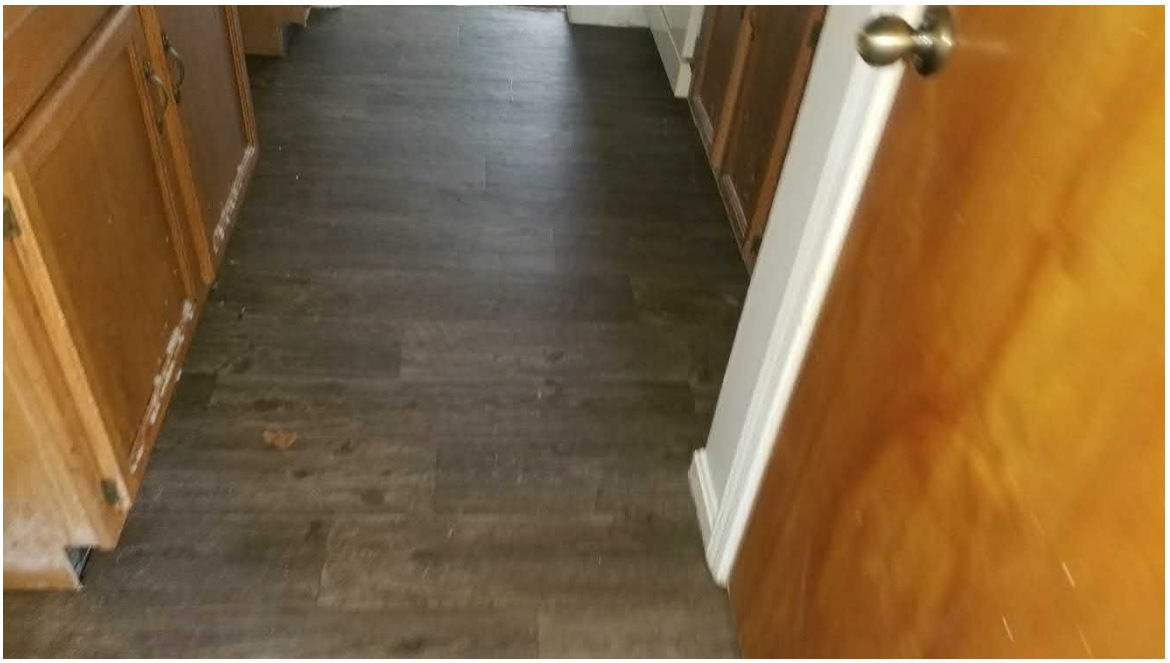
9	DESCRIPTION	View of a vent penetration on the roof of 2712 Holly Park Drive.
	DATE	May 7, 2021

10	DESCRIPTION	View of a vent penetration on the roof of 2714 Holly Park Drive.
	DATE	May 7, 2021

11	DESCRIPTION	View of the gutter system on 2712 Holly Park Drive.
	DATE	May 7, 2021



12	DESCRIPTION	View of the attic space in 2702 Holly Park Drive.
	DATE	May 7, 2021



13	DESCRIPTION	View of the kitchen in 2710 Holly Park Drive Apartment #4.
	DATE	May 7, 2021

14	DESCRIPTION	View of the entry door system and living room floor in 2702 Holly Park Drive Apartment #2.
	DATE	May 7, 2021

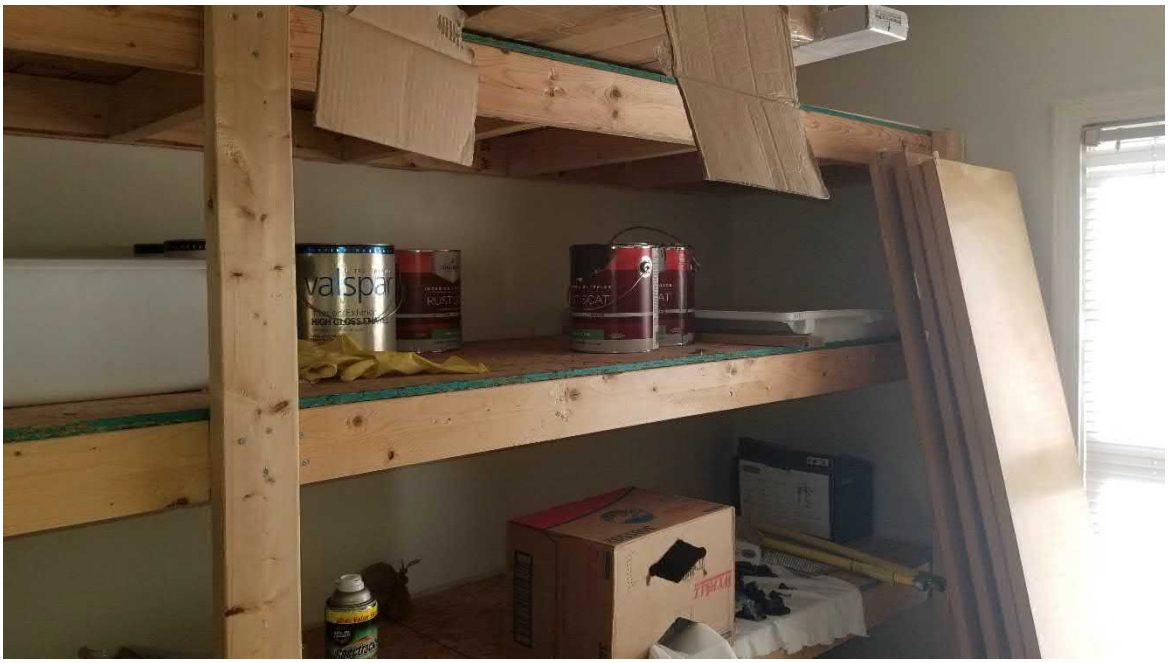
15	DESCRIPTION	View of a digital thermostat in the maintenance office.
	DATE	May 7, 2021

16	DESCRIPTION	View of a compact fluorescent light bulb in a front porch lantern.
	DATE	May 7, 2021

17	DESCRIPTION	View of a fertilizer, herbicide and pesticide stored in the maintenance office.
	DATE	May 7, 2021

18	DESCRIPTION	View of a lubricant store in the maintenance office.
	DATE	May 7, 2021

19	DESCRIPTION	View of four foot T-12 fluorescent light tubes stored in the maintenance office.
	DATE	May 7, 2021



20	DESCRIPTION	View of latex based paint stored in the maintenance office.
	DATE	May 7, 2021

APPENDIX B

ASBESTOS FIELD SAMPLE LOGS

ACM BUILDING SURVEY SAMPLE LOG – EXTERIOR

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: EXTERIOR
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
E-01A	RED BRICK & GRAY MORTAR	2700 – SIDE A
E-01B	RED BRICK & GRAY MORTAR	2706 – SIDE D
E-01C	RED BRICK & GRAY MORTAR	2708 – SIDE B
E-01D	RED BRICK & GRAY MORTAR	2710 – SIDE D
E-01E	RED BRICK & GRAY MORTAR	2714 – SIDE A
E-02A	WHITE DOOR FRAME CAULK	2700, UNIT 3
E-02B	WHITE DOOR FRAME CAULK	2710, UNIT 1
E-02C	WHITE DOOR FRAME CAULK	2714, UNIT 3
E-03A	GRAY CONCRETE FOUNDATION & MORTAR	2700 – SIDE C/D
E-03B	GRAY CONCRETE FOUNDATION & MORTAR	2710 – SIDE C/D
E-03C	GRAY CONCRETE FOUNDATION & MORTAR	2714 – SIDE B/C
E-04A	GRAY CONCRETE PORCH SLAB	2700, UNIT 2
E-04B	GRAY CONCRETE PORCH SLAB	2702, UNIT 2
E-04C	GRAY CONCRETE PORCH SLAB	2714, UNIT 4
E-05A	GRAY CONCRETE HVAC PAD	2714 – SIDE C
E-05B	GRAY CONCRETE HVAC PAD	2710 – SIDE C
E-05C	GRAY CONCRETE HVAC PAD	2700 – SIDE C
E-06A	WHITE WINDOW FRAME CAULK	2700, UNIT 5 – 2ND FLOOR
E-06B	WHITE WINDOW FRAME CAULK	2710, UNIT 1 – 1ST FLOOR
E-06C	WHITE WINDOW FRAME CAULK	2714, UNIT 3 – 1ST FLOOR
E-07A	WHITE FACIA CORNER CAULK	2700, UNIT 3 - PORCH
E-07B	WHITE FACIA CORNER CAULK	2714 – PORCH

ACM BUILDING SURVEY SAMPLE LOG – ROOF

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: ROOF
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
R-01A	BROWN ASPHALT SHINGLE & BLACK FELT	2714 - ROOF
R-01B	BROWN ASPHALT SHINGLE & BLACK FELT	2712 – ROOF
R-01C	BROWN ASPHALT SHINGLE & BLACK FELT	2700 - ROOF
R-02A	WHITE METAL FLASHING CAULK (TOP)	2714 - ROOF
R-02B	WHITE METAL FLASHING CAULK @ FIREWALL	2700 - ROOF
R-03A	BLACK PLUMBING VENT FLASHING CAULK	2714 - ROOF
R-03B	BLACK METAL FLASHING CAULK (BOTTOM)	2714 - ROOF
E-04A	WHITE CAULK @ GUTTER & WOOD FACIA	2712 – ROOF
E-04B	WHITE CAULK @ WOOD SOFFIT & FACIA	2700 - ROOF

ACM BUILDING SURVEY SAMPLE LOG – INTERIOR

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-01A	TAN 12X12'' VCT	2714 – MAINT. OFFICE
I-01B	TAN 12X12'' VCT	2700, UNIT 2 – KITCHEN
I-02A	TAN 12X12'' SELF ADHESIVE VCT	2714 – MAINT. OFFICE
I-02B	TAN 12X12'' SELF ADHESIVE VCT	2714 – MAINT. OFFICE
I-03A	WHITE CERAMIC TILE / GROUT / MORTAR	2714 – 1ST FL. BATH
I-03B	WHITE CERAMIC TILE / GROUT / MORTAR	2700 – 1ST FL. BATH
I-03C	WHITE CERAMIC TILE / GROUT / MORTAR	2702 – 1ST FL. BATH
I-04A	WHITE GYPSUM BOARD	2702, UNIT 2 – PANTRY
I-04B	WHITE GYPSUM BOARD	2704, UNIT 6 – DINING ROOM
I-04C	WHITE GYPSUM BOARD	2710, UNIT 1 – HVAC CLOSET
I-04D	WHITE GYPSUM BOARD	2710, UNIT 4 – HVAC CLOSET
I-04E	WHITE GYPSUM BOARD	2714, UNIT 3 - PANTRY
I-05A	TAN GYPSUM BOARD MUD	2714, UNIT 3 - PANTRY
I-05B	TAN GYPSUM BOARD MUD	2714 – MAINT. OFFICE
I-05C	TAN GYPSUM BOARD MUD	2702, UNIT 2 – PANTRY
I-05D	TAN GYPSUM BOARD MUD & YELLOW TAPE	2712, UNIT 4 – LIVING ROOM
I-05E	TAN GYPSUM BOARD MUD & TAM TAPE	2704, UNIT 6 – DINING ROOM
I-06A	WHITE GYPSUM BOARD FIRE WALL	2400 – ATTIC
I-06B	WHITE GYPSUM BOARD FIRE WALL	2402 – ATTIC
I-06C	WHITE GYPSUM BOARD FIRE WALL	2410 - ATTIC
I-07A	TAN KITCHEN COUNTERTOP CAULK	2700, UNIT 2 – KITCHEN
I-07B	TAN KITCHEN COUNTERTOP CAULK	2702, UNIT 2 – KITCHEN
I-08A	WHITE BATHROOM SINK CAULK	2710, UNIT 4 – BATHROOM
I-08B	WHITE BATHROOM SINK CAULK	2712, UNIT 4 - BATHROOM
I-09A	WHITE INTERIOR DOOR FRAME CAULK	2710, UNIT 4
I-09B	WHITE INTERIOR WINDOW FRAME CAULK	2702, UNIT 2 – LIVING ROOM
I-09C	WHITE INTERIOR WINDOW FRAME CAULK	2714 – MAINT. OFFICE
I-10A	BLACK COVEBASE & MASTIC	2700, UNIT 2 – 1ST FLOOR BATH
I-10B	BLACK COVEBASE & MASTIC	2700, UNIT 2 – 1ST FLOOR BATH
I-11A	TAN TEXTURED CEILING MUD	2714, UNIT 3 – KITCHEN
I-11B	TAN TEXTURED CEILING MUD	2712, UNIT 4 – KITCHEN
I-11C	TAN TEXTURED CEILING MUD	2700, UNIT 2 – KITCHEN
I-11D	TAN TEXTURED CEILING MUD	2710, UNIT 4 – KITCHEN
I-11E	TAN TEXTURED CEILING MUD	2704, UNIT 6 – DINING ROOM

ACM BUILDING SURVEY SAMPLE LOG – INTERIOR (CONT.)

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR (CONT.)
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-12A	HVAC DUCT TAPE	2714, UNIT 3 – HVAC CLOSET
I-12B	HVAC DUCT TAPE	2712, UNIT 4 – HVAC CLOSET
I-13A	TAN FORMICA COUTERTOP	2700, UNIT 2 – KITCHEN
I-13B	TAN FORMICA COUTERTOP	2702, UNIT 2 – KITCHEN
I-13C	TAN FORMICA COUTERTOP	2712, UNIT 4 – KITCHEN
I-14A	TAN LINOLEUM W/ PINK DESIGN	2704, UNIT 6
I-14B	TAN LINOLEUM W/ PINK DESIGN	2710, UNIT 4
I-15A	LIGHT GRAY LINOLEUM W/ GRAY TRIANGLE	2704, UNIT 6
I-15B	LIGHT GRAY LINOLEUM W/ GRAY TRIANGLE	2704, UNIT 6
I-16A	TAN LINOLEUM W/ RECTANGLE PATTERN	2714 – MAINT. OFFICE
I-16B	TAN LINOLEUM W/ RECTANGLE PATTERN	2714 – MAINT. OFFICE
I-17A	DARK TAN LINOLEUM	2714, UNIT 3 - ENTRANCE
I-17B	DARK TAN LINOLEUM	2714, UNIT 3 - ENTRANCE
I-18A	WHITE LINOLEUM	2714, UNIT 3 - PANTRY
I-18B	WHITE LINOLEUM	2714, UNIT 3 - PANTRY
I-19A	DARK GRAY WOOD PATTERN LINOLEUM	2710, UNIT 4 – KITCHEN
I-19B	DARK GRAY WOOD PATTERN LINOLEUM	2710, UNIT 4 – KITCHEN
I-20A	BROWN WOOD PATTERN LINOLEUM	2700, UNIT 2 – HVAC CLOSET
I-20B	BROWN WOOD PATTERN LINOLEUM	2700, UNIT 2 – HVAC CLOSET
I-21A	LIGHT BROWN WOOD PATTERN LINOLEUM	2712, UNIT 4 – LAUNDRY RM.
I-21B	LIGHT BROWN WOOD PATTERN LINOLEUM	2712, UNIT 4 – LAUNDRY RM.
I-22A	TAN LINOLEUM	2700, UNIT 2 – ENTRANCE
I-22B	TAN LINOLEUM	2702, UNIT 2 – ENTRANCE

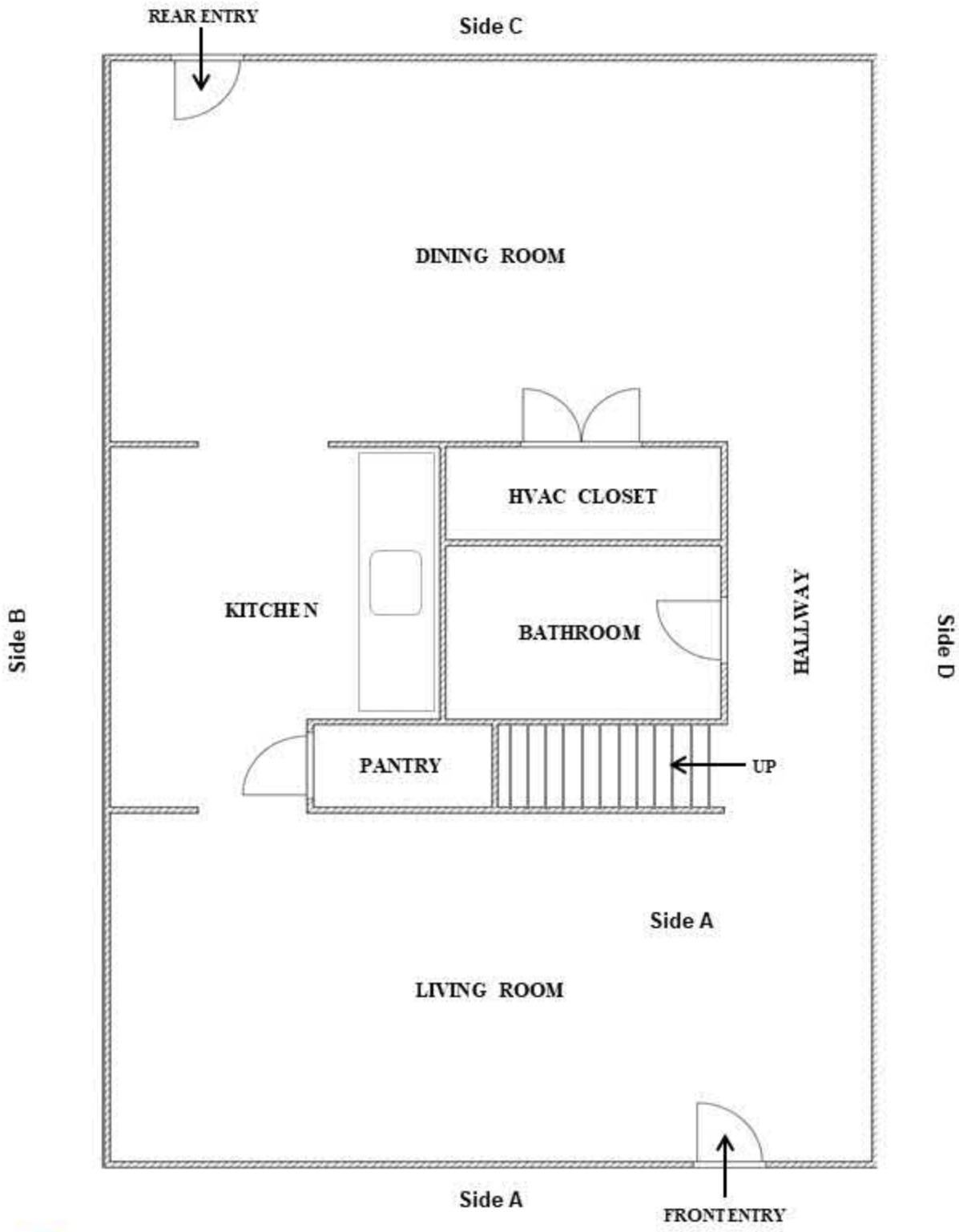
ACM BUILDING SURVEY SAMPLE LOG – INTERIOR (CONT.)

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR (CONT.)
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-23A	BEIGE LINOLEUM	2712, UNIT 4 – HVAC CLOSET
I-23B	BEIGE LINOLEUM	2712, UNIT 4 – HVAC CLOSET
I-24A	LIGHT BROWN LINOLEUM	2700, UNIT 2 – LAUNDRY RM.
I-24B	LIGHT BROWN LINOLEUM	2700, UNIT 2 – LAUNDRY RM.
I-25A	LIGHT TAN LINOLEUM	2710, UNIT 4 – ENTRANCE
I-25B	LIGHT TAN LINOLEUM	2710, UNIT 4 – ENTRANCE

APPENDIX C

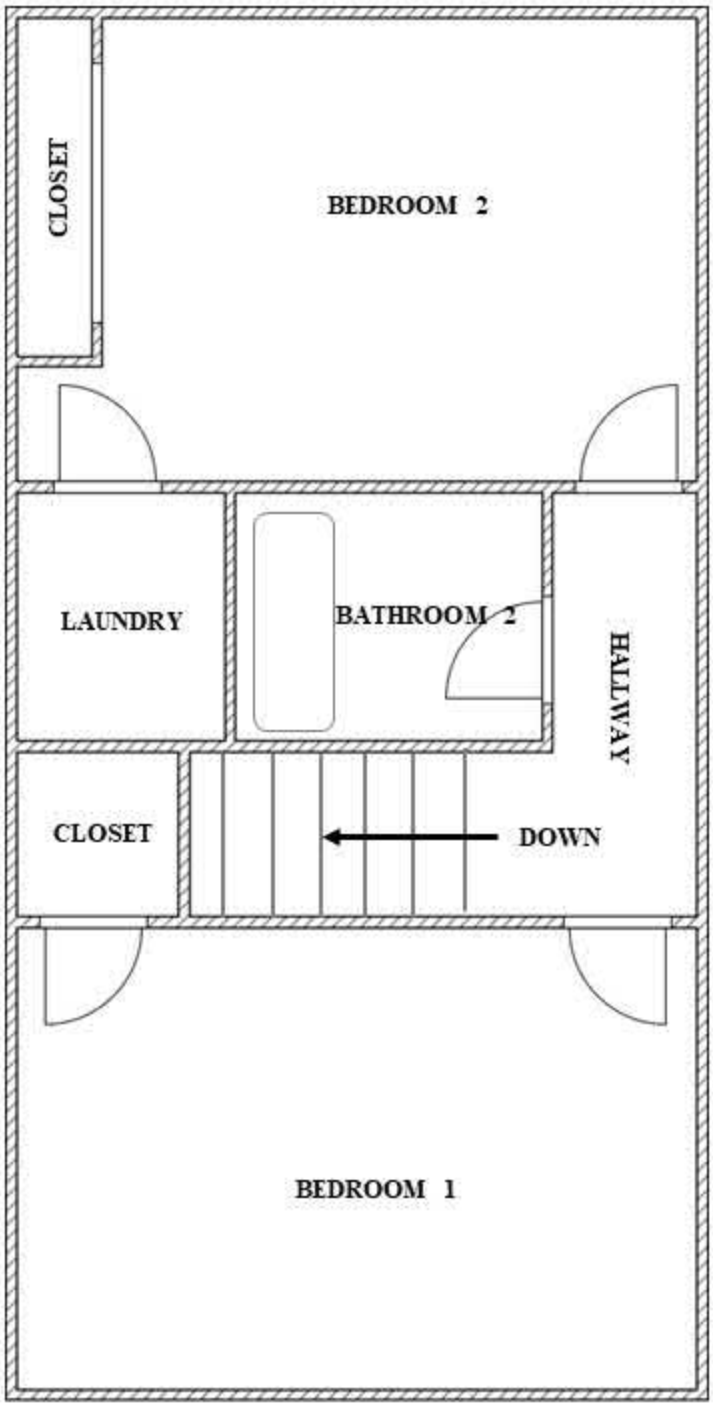
ASBESTOS SAMPLE LOCATION DIAGRAMS



NO POSITIVE ASBESTOS SAMPLES

	Figure 2	**Sample Location Diagram – 1st Floor – Kitchen on Left** Holly Park Drive– Louisville, Kentucky
	NTS	May 7, 2021

Side C



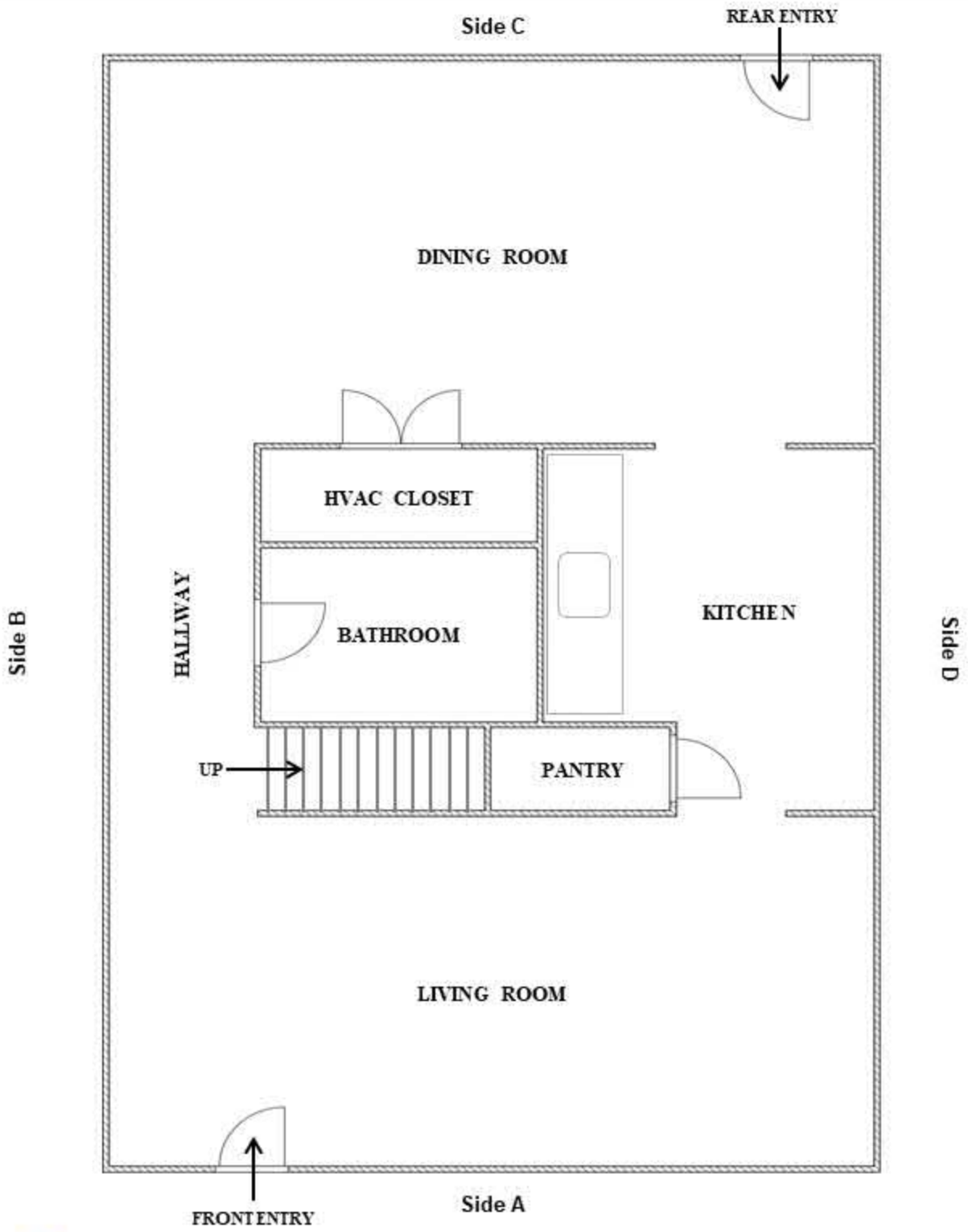
Side B

Side D

Side A

NO POSITIVE ASBESTOS SAMPLES

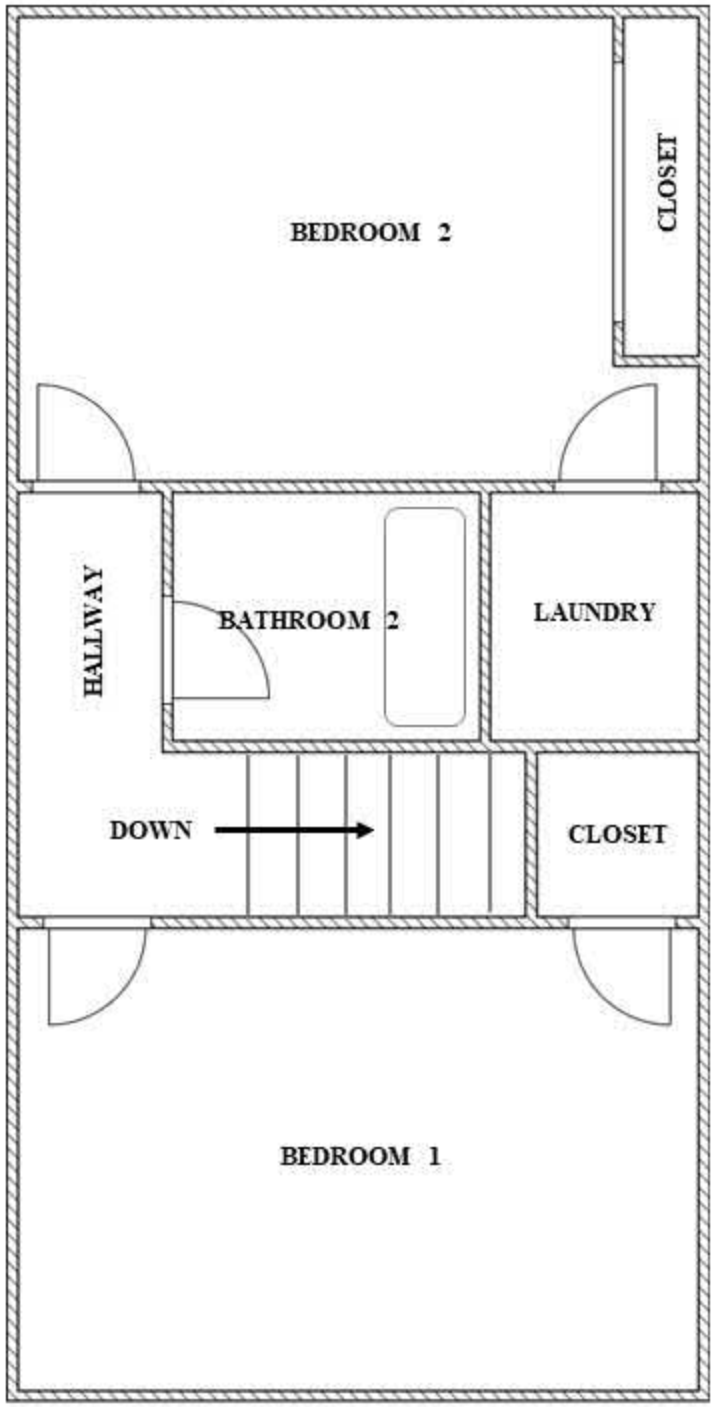
	Figure 3	**Sample Location Diagram – 2nd Floor – Kitchen on Left** Holly Park Drive– Louisville, Kentucky
	NTS	May 2021



NO POSITIVE ASBESTOS SAMPLES

	Figure 4	**Sample Location Diagram – 1st Floor – Kitchen on Right** Holly Park Drive– Louisville, Kentucky
	NTS	May 7, 2021

Side C



Side B

Side D

Side A

NO POSITIVE ASBESTOS SAMPLES

	Figure 5	**Sample Location Diagram – 2nd Floor – Kitchen on Right** Holly Park Drive– Louisville, Kentucky
	NTS	May 2021

ADDPENDIX D

ASBESTOS LICENSES AND CERTIFICATIONS

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

ANTHONY R. HATTON
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

August 28, 2020

Christopher J Stovall
12537 Cropper Rd
Pleasureville (Henry), Kentucky 40057

Asbestos Inspector
AI Number: 154554
License Number: 61781
Expires: August 19, 2021

Dear Christopher J Stovall:

This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is $100.00 per person per discipline, except for abatement worker ($20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a $10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

Commonwealth of Kentucky
Department for Environmental Protection
Division for Air Quality

Christopher J Stovall

Has met the requirements of 401 KAR 58:005 and is accredited as an:

Asbestos Inspector

Agency Interest Id:	**154554**
License Number:	**61781**
Issue Date:	**08/25/2020**
Expiration Date:	**08/19/2021**

Sincerely,

Emma Moreo

Emma Moreo
Field Support Section
Field Operations Branch

ANDY BESHEAR
GOVERNOR

REBECCA W. GOODMAN
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION

ANTHONY R. HATTON
COMMISSIONER

300 SOWER BOULEVARD
FRANKFORT, KENTUCKY 40601

September 18, 2020

Gregory Bailey
3759 Stanton Blvd
Louisville, Kentucky 40220

Asbestos Inspector
AI Number: 157056
License Number: 61783
Expires: August 31, 2021

Dear Gregory Bailey:

This is to acknowledge receipt of your application for accreditation as an asbestos abatement professional. Your application has been approved and the above-referenced card is enclosed.

Initial accreditation fee is $100.00 per person per discipline, except for abatement worker ($20.00). Renewal fees for accreditations within one year of the expiration date are one-half of the initial fees. Renewals for accreditations expired over one year require the initial fee. There is a $10.00 duplication charge to replace a lost card. Please also note that the expiration date on your license is determined by the expiration date on the training certificate submitted with your application.

When submitting application packets, please note the following:

- do not staple any of the application materials;
- make sure to fill out the application completely, including your signature; and
- include current proof of training for the discipline(s) for which you are applying

If you have any questions regarding this matter, please call our office at (502) 782-6717.

Sincerely,

Emma Moreo

Emma Moreo
Field Support Section
Field Operations Branch

Commonwealth of Kentucky
Department for Environmental Protection
Division for Air Quality

Gregory Bailey

Has met the requirements of 401 KAR 58:005 and is accredited as an:

Asbestos Inspector

Agency Interest Id: **157056**
License Number: **61783**
Issue Date: **09/15/2020**
Expiration Date: **08/31/2021**

APPENDIX E

ASBESTOS LABORATORY ANALYTICAL RESULTS

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for TriEco, LLC

Report Date: 5/17/2021

Project Name: Holly Park Drive - Exterior

Project #: 210325-G

SanAir ID#: 21023501

NVLAP TESTING

NVLAP LAB CODE 200870-0

1551 Oakbridge Dr. Suite B | Powhatan, Virginia 23139-8061
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

SanAir ID Number
21023501
FINAL REPORT
5/17/2021 12:57:37 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: EXTERIOR
Project Name: Holly Park Drive - Exterior
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Dear Chris Stovall,

We at SanAir would like to thank you for the work you recently submitted. The 22 sample(s) were received on Friday, May 14, 2021 via FedEx. The final report(s) is enclosed for the following sample(s): E-01A, E-01B, E-01C, E-01D, E-01E, E-02A, E-02B, E-02C, E-03A, E-03B, E-03C, E-04A, E-04B, E-04C, E-05A, E-05B, E-05C, E-06A, E-06B, E-06C, E-07A, E-07B.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 22 samples in Good condition.

SanAir Technologies Laboratory

SanAir ID Number
21023501
FINAL REPORT
5/17/2021 12:57:37 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: EXTERIOR
Project Name: Holly Park Drive - Exterior
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Analyst: Childress, Susan

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
E-01A / 21023501-001 Brick & Mortar 2700 - Side A, Brick	Red Non-Fibrous Homogeneous		100% Other	None Detected
E-01A / 21023501-001 Brick & Mortar 2700 - Side A, Mortar	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-01B / 21023501-002 Brick & Mortar 2706 - Side D, Brick	Red Non-Fibrous Homogeneous		100% Other	None Detected
E-01B / 21023501-002 Brick & Mortar 2706 - Side D, Mortar	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-01C / 21023501-003 Brick & Mortar 2708 - Side B, Brick	Red Non-Fibrous Homogeneous		100% Other	None Detected
E-01C / 21023501-003 Brick & Mortar 2708 - Side B, Mortar	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-01D / 21023501-004 Brick & Mortar 2710 - Side D, Brick	Red Non-Fibrous Homogeneous		100% Other	None Detected
E-01D / 21023501-004 Brick & Mortar 2710 - Side D, Mortar	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-01E / 21023501-005 Brick & Mortar 2714 - Side A, Brick	Red Non-Fibrous Homogeneous		100% Other	None Detected
E-01E / 21023501-005 Brick & Mortar 2714 - Side A, Mortar	Gray Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Susan L. Childress Approved Signatory: Johnathan Wilson

Analysis Date: 5/17/2021 Date: 5/17/2021

SanAir Technologies Laboratory

SanAir ID Number
21023501
FINAL REPORT
5/17/2021 12:57:37 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: EXTERIOR
Project Name: Holly Park Drive - Exterior
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Analyst: Childress, Susan

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
E-02A / 21023501-006 Door Frame Caulk 2700, Unit 3	White Non-Fibrous Homogeneous		100% Other	None Detected
E-02B / 21023501-007 Door Frame Caulk 2710, Unit 1	White Non-Fibrous Homogeneous		100% Other	None Detected
E-02C / 21023501-008 Door Frame Caulk 2714, Unit 3	White Non-Fibrous Homogeneous		100% Other	None Detected
E-03A / 21023501-009 Concrete Foundation & Mortar 2700 - Side C/D	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-03B / 21023501-010 Concrete Foundation & Mortar 2710 - Side C/D	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-03C / 21023501-011 Concrete Foundation & Mortar 2714 - Side B/C	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-04A / 21023501-012 Concrete Porch Slab 2700, Unit 2	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-04B / 21023501-013 Concrete Porch Slab 2702, Unit 2	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-04C / 21023501-014 Concrete Porch Slab 2714, Unit 4	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-05A / 21023501-015 Concrete HVAC Pad 2714 - Side C	Gray Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Susan L. Childress Approved Signatory: Johnathan Wilson

Analysis Date: 5/17/2021 Date: 5/17/2021

SanAir Technologies Laboratory

SanAir ID Number
21023501
FINAL REPORT
5/17/2021 12:57:37 PM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: EXTERIOR
Project Name: Holly Park Drive - Exterior
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Analyst: Childress, Susan

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
E-05B / 21023501-016 Concrete HVAC Pad 2710 - Side C	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-05C / 21023501-017 Concrete HVAC Pad 2700 - Side C	Gray Non-Fibrous Homogeneous		100% Other	None Detected
E-06A / 21023501-018 Window Frame Caulk 2700, Unit 5 -2nd Floor	White Non-Fibrous Homogeneous		100% Other	None Detected
E-06B / 21023501-019 Window Frame Caulk 2710, Unit 1 -1st Floor	White Non-Fibrous Homogeneous		100% Other	None Detected
E-06C / 21023501-020 Window Frame Caulk 2714, Unit 3 -1st Floor	White Non-Fibrous Homogeneous		100% Other	None Detected
E-07A / 21023501-021 Facia Corner Caulk 2700, Unit 3 - Porch	White Non-Fibrous Homogeneous		100% Other	None Detected
E-07B / 21023501-022 Facia Corner Caulk 2714-Porch	White Non-Fibrous Homogeneous		100% Other	None Detected

Analyst: Susan L. Childress Approved Signatory: Johnathan Wilson

Analysis Date: 5/17/2021 Date: 5/17/2021

Disclaimer

This report is the sole property of the client named on the SanAir Technologies Laboratory chain-of-custody (COC). Results in the report are confidential information intended only for the use by the customer listed on the COC. Neither results nor reports will be discussed with or released to any third party without our client's written permission. The final report shall not be reproduced except in full without written approval of the laboratory to assure that parts of the report are not taken out of context. The information provided in this report applies only to the samples submitted and is relevant only for the date, time, and location of sampling. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample(s) in the condition in which they arrived at the laboratory and information provided by the client on the COC, such as: project number, project name, collection dates, po number, special instructions, samples collected by, sample numbers, sample identifications, sample type, selected analysis type, flow rate, total volume or area, and start stop times that may affect the validity of the results in this report. Samples were received in good condition unless otherwise noted on the report. SanAir assumes no responsibility or liability for the manner in which the results are used or interpreted. This report does not constitute and shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any other U.S. governmental agencies and may not be certified by every local, state, and federal regulatory agencies.

Samples are held for a period of 60 days. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations.

For NY state samples, method EPA 600/M4-82-020 is performed.

NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Certifications
NVLAP lab code 200870-0
City of Philadelphia: ALL-460
PA Department of Environmental Protection Number: 68-05397
California License Number: 2915
Colorado License Number: AL-23143
Connecticut License Number: PH-0105
Massachusetts License Number: AA000222
Maine License Number: LB-0075, LA-0084
New York ELAP lab ID: 11983
Rhode Island License Number: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia 3333000323
Washington State License Number: C989
West Virginia License Number: LT000616
Vermont License: AL166318
Louisiana Department of Environmental Quality: 212253, Cert 05088

Revision Date: 8/14/2020

SanAir Technologies Laboratory
1551 Oakbridge Drive Suite B
Powhatan, VA 23139
804-897-1177 / 888-895-1177
Fax 804-897-0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number 21023501

Company: TriEco, LLC	Project #: 210325-G	Collected by: Chris Stovall
Address: 7710 Springvale Drive	Project Name: Holly Park Drive - Exterior	Phone #: 502-553-9336
City, St., Zip: Louisville, KY 40241	Date Collected: 5/7/21	Fax #: 502-657-0241
State of Collection: KY Account#: 1867	P.O. Number: EXTERIOR	Email: cstovall@trieco.net

Bulk

ABB	PLM EPA 600/R-93/116	☑
	Positive Stop ☑	
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB	☐
ABBCH	TEM Chatfield	☐
ABBTM	TEM EPA NOB	☐

Water

ABHE	EPA 100.2	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA*	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐

New York ELAP

PLM NY	PLM EPA 600/M4-82-020	☐
ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Soil/Vermiculite

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

Matrix	Other	
		☐

Turn Around Times				
	3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	24 HR ■
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Special Instructions EXTERIOR

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
	PLEASE SEE ATTACHED SAMPLE LOG					

Relinquished by	Date	Time	Received by	Date	Time
CJS	5/13/21	5:00PM	JAD	5/14/21	9:45am

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time. Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a $10 shipping fee.

TriEco

Z1023501

ACM BUILDING SURVEY SAMPLE LOG – EXTERIOR

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: EXTERIOR
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
E-01A	RED BRICK & GRAY MORTAR	2700 – SIDE A
E-01B	RED BRICK & GRAY MORTAR	2706 – SIDE D
E-01C	RED BRICK & GRAY MORTAR	2708 – SIDE B
E-01D	RED BRICK & GRAY MORTAR	2710 – SIDE D
E-01E	RED BRICK & GRAY MORTAR	2714 – SIDE A
E-02A	WHITE DOOR FRAME CAULK	2700, UNIT 3
E-02B	WHITE DOOR FRAME CAULK	2710, UNIT 1
E-02C	WHITE DOOR FRAME CAULK	2714, UNIT 3
E-03A	GRAY CONCRETE FOUNDATION & MORTAR	2700 – SIDE C/D
E-03B	GRAY CONCRETE FOUNDATION & MORTAR	2710 – SIDE C/D
E-03C	GRAY CONCRETE FOUNDATION & MORTAR	2714 – SIDE B/C
E-04A	GRAY CONCRETE PORCH SLAB	2700, UNIT 2
E-04B	GRAY CONCRETE PORCH SLAB	2702, UNIT 2
E-04C	GRAY CONCRETE PORCH SLAB	2714, UNIT 4
E-05A	GRAY CONCRETE HVAC PAD	2714 – SIDE C
E-05B	GRAY CONCRETE HVAC PAD	2710 – SIDE C
E-05C	GRAY CONCRETE HVAC PAD	2700 – SIDE C
E-06A	WHITE WINDOW FRAME CAULK	2700, UNIT 5 – 2ND FLOOR
E-06B	WHITE WINDOW FRAME CAULK	2710, UNIT 1 – 1ST FLOOR
E-06C	WHITE WINDOW FRAME CAULK	2714, UNIT 3 – 1ST FLOOR
E-07A	WHITE FACIA CORNER CAULK	2700, UNIT 3 - PORCH
E-07B	WHITE FACIA CORNER CAULK	2714 – PORCH

JAD 5/14/21 9.45

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for TriEco, LLC

Report Date: 5/17/2021

Project Name: Holly Park Drive - Roof

Project #: 210325-G

SanAir ID#: 21023507

NVLAP TESTING

NVLAP LAB CODE 200870-0

1551 Oakbridge Dr. Suite B | Powhatan, Virginia 23139-8061
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

SanAir ID Number
21023507
FINAL REPORT
5/17/2021 11:35:26 AM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: ROOF
Project Name: Holly Park Drive - Roof
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Dear Chris Stovall,

We at SanAir would like to thank you for the work you recently submitted. The 9 sample(s) were received on Friday, May 14, 2021 via FedEx. The final report(s) is enclosed for the following sample(s): R-01A, R-01B, R-01C, R-02A, R-02B, R-03A, R-03B, R-04A, R-04B.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 9 samples in Good condition.

SanAir Technologies Laboratory

SanAir ID Number
21023507
FINAL REPORT
5/17/2021 11:35:26 AM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: ROOF
Project Name: Holly Park Drive - Roof
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Analyst: Pisula, Nicholas

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-01A / 21023507-001 Asphalt Shingle & Felt 2714 - Roof, Shingle	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-01A / 21023507-001 Asphalt Shingle & Felt 2714 - Roof, Felt	Black Fibrous Homogeneous	60% Cellulose	40% Other	None Detected
R-01B / 21023507-002 Asphalt Shingle & Felt 2712 - Roof, Shingle	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-01B / 21023507-002 Asphalt Shingle & Felt 2712 - Roof, Felt	Black Fibrous Homogeneous	60% Cellulose	40% Other	None Detected
R-01C / 21023507-003 Asphalt Shingle & Felt 2700 - Roof, Shingle	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
R-01C / 21023507-003 Asphalt Shingle & Felt 2700 - Roof, Felt	Black Fibrous Homogeneous	60% Cellulose	40% Other	None Detected
R-02A / 21023507-004 Metal Flashing Caulk (TOP) 2714 - Roof	White Non-Fibrous Homogeneous		100% Other	None Detected
R-02B / 21023507-005 Metal Flashing Caulk @ Firewall 2700 - Roof	White Non-Fibrous Homogeneous		100% Other	None Detected
R-03A / 21023507-006 Plumbing Vent Flashing Caulk 2714 - Roof	Black Non-Fibrous Homogeneous		100% Other	None Detected
R-03B / 21023507-007 Metal Flashing Caulk (BOTTOM) 2714 - Roof	Black Non-Fibrous Homogeneous		100% Other	None Detected

Analyst:

Analysis Date: 5/17/2021

Approved Signatory:

Date: 5/17/2021

SanAir ID Number
21023507
FINAL REPORT
5/17/2021 11:35:26 AM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: ROOF
Project Name: Holly Park Drive - Roof
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Analyst: Pisula, Nicholas

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
R-04A / 21023507-008 Caulk @ Gutter & Wood Facia 2714 - Roof	White Non-Fibrous Homogeneous		100% Other	None Detected
R-04B / 21023507-009 Caulk @ Woof Soffit & Facia 2700 - Roof	White Non-Fibrous Homogeneous		100% Other	None Detected

Analyst:

Analysis Date: 5/17/2021

Approved Signatory:

Date: 5/17/2021

Disclaimer

This report is the sole property of the client named on the SanAir Technologies Laboratory chain-of-custody (COC). Results in the report are confidential information intended only for the use by the customer listed on the COC. Neither results nor reports will be discussed with or released to any third party without our client's written permission. The final report shall not be reproduced except in full without written approval of the laboratory to assure that parts of the report are not taken out of context. The information provided in this report applies only to the samples submitted and is relevant only for the date, time, and location of sampling. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample(s) in the condition in which they arrived at the laboratory and information provided by the client on the COC, such as: project number, project name, collection dates, po number, special instructions, samples collected by, sample numbers, sample identifications, sample type, selected analysis type, flow rate, total volume or area, and start stop times that may affect the validity of the results in this report. Samples were received in good condition unless otherwise noted on the report. SanAir assumes no responsibility or liability for the manner in which the results are used or interpreted. This report does not constitute and shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any other U.S. governmental agencies and may not be certified by every local, state, and federal regulatory agencies.

Samples are held for a period of 60 days. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations.

For NY state samples, method EPA 600/M4-82-020 is performed.

NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Certifications
NVLAP lab code 200870-0
City of Philadelphia: ALL-460
PA Department of Environmental Protection Number: 68-05397
California License Number: 2915
Colorado License Number: AL-23143
Connecticut License Number: PH-0105
Massachusetts License Number: AA000222
Maine License Number: LB-0075, LA-0084
New York ELAP lab ID: 11983
Rhode Island License Number: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia 3333000323
Washington State License Number: C989
West Virginia License Number: LT000616
Vermont License: AL166318
Louisiana Department of Environmental Quality: 212253, Cert 05088

Revision Date: 8/14/2020

SanAir Technologies Laboratory
1551 Oakbridge Drive Suite B
Powhatan, VA 23139
804-897-1177 / 888-895-1177
Fax 804-897-0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number: 21023507

Company: TriEco, LLC	Project #: 210325-G	Collected by: Chris Stovall
Address: 7710 Springvale Drive	Project Name: Holly Park Drive - Roof	Phone #: 502-553-9336
City, St., Zip: Louisville, KY 40241	Date Collected: 5/7/21	Fax #: 502-657-0241
State of Collection: KY Account#: 1867	P.O. Number: ROOF	Email: cstovall@trieco.net

Bulk

ABB	PLM EPA 600/R-93/116	☑
	Positive Stop ☑	
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB	☐
ABBCH	TEM Chatfield	☐
ABBTM	TEM EPA NOB	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA*	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐

Soil/Vermiculite

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Water

ABHE	EPA 100.2	☐

New York ELAP

PLM NY	PLM EPA 600/M4-82-020	☐
ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

Other

Matrix		
		☐

Turn Around Times				
	3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	24 HR ■
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Special Instructions: ROOF

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
	PLEASE SEE ATTACHED SAMPLE LOG					

Relinquished by	Date	Time	Received by	Date	Time
CJS	5/13/21	5:00PM	JAD	5/14/21	9:45am

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time. Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a $10 shipping fee.

TriEco

210235O7

ACM BUILDING SURVEY SAMPLE LOG – ROOF

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: ROOF
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
R-01A	BROWN ASPHALT SHINGLE & BLACK FELT	2714 - ROOF
R-01B	BROWN ASPHALT SHINGLE & BLACK FELT	2712 – ROOF
R-01C	BROWN ASPHALT SHINGLE & BLACK FELT	2700 - ROOF
R-02A	WHITE METAL FLASHING CAULK (TOP)	2714 - ROOF
R-02B	WHITE METAL FLASHING CAULK @ FIREWALL	2700 - ROOF
R-03A	BLACK PLUMBING VENT FLASHING CAULK	2714 - ROOF
R-03B	BLACK METAL FLASHING CAULK (BOTTOM)	2714 - ROOF
E-04A	WHITE CAULK @ GUTTER & WOOD FACIA	2712 – ROOF
E-04B	WHITE CAULK @ WOOD SOFFIT & FACIA	2700 - ROOF

JAD 5/14/21 9:45am

SanAir Technologies Laboratory

The Identification Specialists

Analysis Report prepared for TriEco, LLC

Report Date: 5/17/2021

Project Name: Holly Park Drive - Interior

Project #: 210325-G

SanAir ID#: 21023489

NVLAP TESTING

NVLAP LAB CODE 200870-0

1551 Oakbridge Dr. Suite B | Powhatan, Virginia 23139-8061
888.895.1177 | 804.897.1177 | fax: 804.897.0070 | IAQ@SanAir.com | SanAir.com

SanAir ID Number
21023489
FINAL REPORT
5/17/2021 11:00:59 AM

Name: TriEco, LLC
Address: 7710 Springvale Drive
Louisville, KY 40241
Phone: 502-657-0240

Project Number: 210325-G
P.O. Number: INTERIOR
Project Name: Holly Park Drive - Interior
Collected Date: 5/7/2021
Received Date: 5/14/2021 9:45:00 AM

Dear Chris Stovall,

We at SanAir would like to thank you for the work you recently submitted. The 63 sample(s) were received on Friday, May 14, 2021 via FedEx. The final report(s) is enclosed for the following sample(s): I-01A, I-01B, I-02A, I-02B, I-03A, I-03B, I-03C, I-04A, I-04B, I-04C, I-04D, I-04E, I-05A, I-05B, I-05C, I-05D, I-05E, I-06A, I-06B, I-06C, I-07A, I-07B, I-08A, I-08B, I-09A, I-09B, I-09C, I-10A, I-10B, I-11A, I-11B, I-11C, I-11D, I-11E, I-12A, I-12B, I-13A, I-13B, I-13C, I-14A, I-14B, I-15A, I-15B, I-16A, I-16B, I-17A, I-17B, I-18A, I-18B, I-19A, I-19B, I-20A, I-20B, I-21A, I-21B, I-22A, I-22B, I-23A, I-23B, I-24A, I-24B, I-25A, I-25B.

These results only pertain to this job and should not be used in the interpretation of any other job. This report is only complete in its entirety. Refer to the listing below of the pages included in a complete final report.

Sincerely,

Sandra Sobrino
Asbestos & Materials Laboratory Manager
SanAir Technologies Laboratory

Final Report Includes:
- Cover Letter
- Analysis Pages
- Disclaimers and Additional Information

Sample conditions:
- 63 samples in Good condition.

SanAir Technologies Laboratory

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Received Date: 5/14/2021 9:45:00 AM

Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-01A / 21023489-001 12x12" VCT 2714 - Main T OFfice, Floor Tile	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-01A / 21023489-001 12x12" VCT 2714 - Main T OFfice, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-01B / 21023489-002 12x12" VCT 2700, Unit 2 - Kitchen, Floor Tile	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-01B / 21023489-002 12x12" VCT 2700, Unit 2 - Kitchen, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-02A / 21023489-003 12x12" Self Adhesive VCT 2714 - Main T Office	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-02B / 21023489-004 12x12" Self Adhesive VCT 2714 - Main T Office	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-03A / 21023489-005 Ceramic Tile / Grout / Mortar 2714 -1st Fl Bath, Ceramic Tile	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-03A / 21023489-005 Ceramic Tile / Grout / Mortar 2714 -1st Fl Bath, Grout	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-03A / 21023489-005 Ceramic Tile / Grout / Mortar 2714 -1st Fl Bath, Mortar	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
I-03B / 21023489-006 Ceramic Tile / Grout / Mortar 2700 - 1st Fl Bath, Ceramic Tile	White Non-Fibrous Heterogeneous		100% Other	None Detected

Analyst: Nathan Vaughn Approved Signatory: Sandra Robins

Analysis Date: 5/15/2021 Date: 5/17/2021

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Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-03B / 21023489-006 Ceramic Tile / Grout / Mortar 2700 - 1st Fl Bath, Grout	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-03B / 21023489-006 Ceramic Tile / Grout / Mortar 2700 - 1st Fl Bath, Mortar	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
I-03C / 21023489-007 Ceramic Tile / Grout / Mortar 2702 - 1st Fl Bath, Ceramic Tile	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-03C / 21023489-007 Ceramic Tile / Grout / Mortar 2702 - 1st Fl Bath, Grout	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-03C / 21023489-007 Ceramic Tile / Grout / Mortar 2702 - 1st Fl Bath, Mortar	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
I-04A / 21023489-008 Gypsum Board 2702, Unit 2 - Pantry	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-04B / 21023489-009 Gypsum Board 2704, Unit 6 - Dining Room	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-04C / 21023489-010 Gypsum Board 2710, Unit 1 - HVAC Closet	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-04D / 21023489-011 Gypsum Board 2710, Unit 2 - HVAC Closet	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-04E / 21023489-012 Gypsum Board 2714, Unit 3 - Pantry	White Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected

Analyst: Nathan Vaughn Approved Signatory: Sandra Robins

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Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-05A / 21023489-013 Gypsum Board Mud 2714, Unit 3 - Pantry	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-05B / 21023489-014 Gypsum Board Mud 2714 - Main T Office	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-05C / 21023489-015 Gypsum Board Mud 2702, Unit 2 - Pantry	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-05D / 21023489-016 Gypsum Board Mud & Tape 2712, Unit 4 - Living Room, Mud	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-05D / 21023489-016 Gypsum Board Mud & Tape 2712, Unit 4 - Living Room, Tape	White Fibrous Heterogeneous	85% Cellulose	15% Other	None Detected
I-05E / 21023489-017 Gypsum Board Mud & Tape 2704, Unit 6 - Dining Room, Mud	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-05E / 21023489-017 Gypsum Board Mud & Tape 2704, Unit 6 - Dining Room, Tape	White Fibrous Heterogeneous	85% Cellulose	15% Other	None Detected
I-06A / 21023489-018 Gypsum Board Fire Wall 2400 - Attic	White Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-06B / 21023489-019 Gypsum Board Fire Wall 2402 - Attic	White Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-06C / 21023489-020 Gypsum Board Fire Wall 2410 - Attic	White Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected

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Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-07A / 21023489-021 Kitchen Countertop Caulk 2700, Unit 2 - Kitchen	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-07B / 21023489-022 Kitchen Countertop Caulk 2702, Unit 2 - Kitchen	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-08A / 21023489-023 Bathroom Sink Caulk 2710, Unit 4 - Bathroom	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-08B / 21023489-024 Bathroom Sink Caulk 2712, Unit 4 - Bathroom	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-09A / 21023489-025 Interior Door Frame Caulk 2710, Unit 4	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-09B / 21023489-026 Interior Window Frame Caulk 2702, Unit 2 - Living Room	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-09C / 21023489-027 Interior Window Frame Caulk 2714 - Main T Office	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-10A / 21023489-028 Covebase & Mastic 2700, Unit 2 - 1st Floor Bath, Cove Base	Black Non-Fibrous Heterogeneous		100% Other	None Detected
I-10A / 21023489-028 Covebase & Mastic 2700, Unit 2 - 1st Floor Bath, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-10B / 21023489-029 Covebase & Mastic 2700, Unit 2 - 1st Floor Bath, Cove Base	Black Non-Fibrous Heterogeneous		100% Other	None Detected

Analyst: Nathan Vaughn Approved Signatory: Sandra Robins

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-10B / 21023489-029 Covebase & Mastic 2700, Unit 2 - 1st Floor Bath, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-11A / 21023489-030 Textured Ceiling Mud 2714, Unit 3 - Kitchen	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-11B / 21023489-031 Textured Ceiling Mud 2712, Unit 4 - Kitchen	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-11C / 21023489-032 Textured Ceiling Mud 2700, Unit 2 - Kitchen	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-11D / 21023489-033 Textured Ceiling Mud 2710, Unit 4 - Kitchen	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-11E / 21023489-034 Textured Ceiling Mud 2704, Unit 6 - Dining Room	White Non-Fibrous Heterogeneous		100% Other	None Detected
I-12A / 21023489-035 HVAC Duct Tape 2714, Unit 3 - HVAC Closet	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
I-12B / 21023489-036 HVAC Duct Tape 2712, Unit 4 - HVAC Closet	Grey Non-Fibrous Heterogeneous		100% Other	None Detected
I-13A / 21023489-037 Formica Countertop 2700, Unit 2 - Kitchen	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-13B / 21023489-038 Formica Countertop 2702, Unit 2 - Kitchen	Tan Non-Fibrous Heterogeneous		100% Other	None Detected

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-13C / 21023489-039 Formica Countertop 2712, Unit 4 - Kitchen	Tan Non-Fibrous Heterogeneous		100% Other	None Detected
I-14A / 21023489-040 Linoleum w/ Design 2704, Unit 6	Tan Non-Fibrous Heterogeneous	40% Cellulose	60% Other	None Detected
I-14B / 21023489-041 Linoleum w/ Design 2710, Unit 4, Linoleum	Tan Non-Fibrous Heterogeneous	40% Cellulose	60% Other	None Detected
I-14B / 21023489-041 Linoleum w/ Design 2710, Unit 4, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-15A / 21023489-042 Linoleum w/ Triangle 2704, Unit 6, Linoleum	Gray Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-15A / 21023489-042 Linoleum w/ Triangle 2704, Unit 6, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-15B / 21023489-043 Linoleum w/ Triangle 2704, Unit 6, Linoleum	Gray Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-15B / 21023489-043 Linoleum w/ Triangle 2704, Unit 6, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-16A / 21023489-044 Linoleum w/ Rectangle 2714 - Main T Office, Linoleum	Tan Non-Fibrous Heterogeneous	40% Cellulose	60% Other	None Detected
I-16A / 21023489-044 Linoleum w/ Rectangle 2714 - Main T Office, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected

Analyst: Nathan Vaughn Approved Signatory: Sandra Robins

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Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-16B / 21023489-045 Linoleum w/ Rectangle 2714 - Main T Office, Linoleum	Tan Non-Fibrous Heterogeneous	40% Cellulose	60% Other	None Detected
I-16B / 21023489-045 Linoleum w/ Rectangle 2714 - Main T Office, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-17A / 21023489-046 Linoleum 2714, Unit 3 - Enterance	Tan Non-Fibrous Heterogeneous	12% Cellulose	88% Other	None Detected
I-17B / 21023489-047 Linoleum 2714, Unit 3 - Enterance	Tan Non-Fibrous Heterogeneous	12% Cellulose	88% Other	None Detected
I-18A / 21023489-048 Linoleum 2714, Unit 3 - Pantry	White Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-18B / 21023489-049 Linoleum 2714, Unit 3 - Pantry	White Non-Fibrous Heterogeneous	20% Cellulose	80% Other	None Detected
I-19A / 21023489-050 Wood Pattern Linoleum 2710 Unit 4 - Kitchen, Linoleum	Gray Non-Fibrous Heterogeneous		100% Other	None Detected
I-19A / 21023489-050 Wood Pattern Linoleum 2710 Unit 4 - Kitchen, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected
I-19B / 21023489-051 Wood Pattern Linoleum 2710 Unit 4 - Kitchen, Linoleum	Gray Non-Fibrous Heterogeneous		100% Other	None Detected
I-19B / 21023489-051 Wood Pattern Linoleum 2710 Unit 4 - Kitchen, Mastic	Yellow Non-Fibrous Heterogeneous		100% Other	None Detected

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Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-20A / 21023489-052 Wood Pattern Linoleum 2700, Unit 2 - HVAC Closet	Brown Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-20B / 21023489-053 Wood Pattern Linoleum 2700, Unit 2 - HVAC Closet	Brown Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-21A / 21023489-054 Wood Pattern Linoleum 2712, Unit 4 - Laundry Rm	Brown Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-21B / 21023489-055 Wood Pattern Linoleum 2712, Unit 4 - Laundry Rm	Brown Non-Fibrous Heterogeneous	10% Cellulose	90% Other	None Detected
I-22A / 21023489-056 Linoluem 2700, Unit 2 - Enterance	Tan Non-Fibrous Heterogeneous	8% Cellulose	92% Other	None Detected
I-22B / 21023489-057 Linoluem 2700, Unit 2 - Enterance	Tan Non-Fibrous Heterogeneous	8% Cellulose	92% Other	None Detected
I-23A / 21023489-058 Linoleum 2712, Unit 4 - HVAC Closet	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
I-23B / 21023489-059 Linoleum 2712, Unit 4 - HVAC Closet	Beige Non-Fibrous Heterogeneous		100% Other	None Detected
I-24A / 21023489-060 Linoleum 2700, Unit 2 - Laundry Rm	Brown Non-Fibrous Heterogeneous		100% Other	None Detected
I-24B / 21023489-061 Linoleum 2700, Unit 2 - Laundry Rm	Brown Non-Fibrous Heterogeneous		100% Other	None Detected

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Analyst: Vaughan, Nathaniel

Asbestos Bulk PLM EPA 600/R-93/116

	Stereoscopic	Components		
SanAir ID / Description	Appearance	% Fibrous	% Non-fibrous	Asbestos Fibers
I-25A / 21023489-062 Linoleum 2710, Unit 4 - Enterance	Tan Non-Fibrous Heterogeneous	8% Cellulose	92% Other	None Detected
I-25B / 21023489-063 Linoleum 2710, Unit 4 - Enterance	Tan Non-Fibrous Heterogeneous	8% Cellulose	92% Other	None Detected

Analyst: Nathaniel Vaughan Approved Signatory: Sandra Robins

Analysis Date: 5/15/2021 Date: 5/17/2021

Disclaimer

This report is the sole property of the client named on the SanAir Technologies Laboratory chain-of-custody (COC). Results in the report are confidential information intended only for the use by the customer listed on the COC. Neither results nor reports will be discussed with or released to any third party without our client's written permission. The final report shall not be reproduced except in full without written approval of the laboratory to assure that parts of the report are not taken out of context. The information provided in this report applies only to the samples submitted and is relevant only for the date, time, and location of sampling. The accuracy of the results is dependent upon the client's sampling procedure and information provided to the laboratory by the client. SanAir assumes no responsibility for the sampling procedure and will provide evaluation reports based solely on the sample(s) in the condition in which they arrived at the laboratory and information provided by the client on the COC, such as: project number, project name, collection dates, po number, special instructions, samples collected by, sample numbers, sample identifications, sample type, selected analysis type, flow rate, total volume or area, and start stop times that may affect the validity of the results in this report. Samples were received in good condition unless otherwise noted on the report. SanAir assumes no responsibility or liability for the manner in which the results are used or interpreted. This report does not constitute and shall not be used to claim product certification, approval, or endorsement by NVLAP, NIST, or any other U.S. governmental agencies and may not be certified by every local, state, and federal regulatory agencies.

Samples are held for a period of 60 days. Fibers smaller than 5 microns cannot be seen with this method due to scope limitations.

For NY state samples, method EPA 600/M4-82-020 is performed.

NYELAP Disclaimer:
Polarized- light microscopy is not consistently reliable in detecting asbestos in floor covering and similar non-friable organically bound materials. Quantitative transmission electron microscopy is currently the only method that can be used to determine if this material can be considered or treated as non-asbestos containing.

Asbestos Certifications
NVLAP lab code 200870-0
City of Philadelphia: ALL-460
PA Department of Environmental Protection Number: 68-05397
California License Number: 2915
Colorado License Number: AL-23143
Connecticut License Number: PH-0105
Massachusetts License Number: AA000222
Maine License Number: LB-0075, LA-0084
New York ELAP lab ID: 11983
Rhode Island License Number: PCM00126, PLM00126, TEM00126
Texas Department of State Health Services License Number: 300440
Commonwealth of Virginia 3333000323
Washington State License Number: C989
West Virginia License Number: LT000616
Vermont License: AL166318
Louisiana Department of Environmental Quality: 212253, Cert 05088

Revision Date: 8/14/2020

SanAir Technologies Laboratory
1551 Oakbridge Drive Suite B
Powhatan, VA 23139
804-897-1177 / 888-895-1177
Fax 804-897-0070
www.sanair.com

Asbestos Chain of Custody

SanAir ID Number 21023489

Company: TriEco, LLC	Project #: 210325-G	Collected by: Chris Stovall
Address: 7710 Springvale Drive	Project Name: Holly Park Drive - Interior	Phone #: 502-553-9336
City, St., Zip: Louisville, KY 40241	Date Collected: 5/7/21	Fax #: 502-657-0241
State of Collection: KY Account#: 1867	P.O. Number: INTERIOR	Email: cstovall@trieco.net

Bulk

ABB	PLM EPA 600/R-93/116	☑
	Positive Stop ☑	
ABEPA	PLM EPA 400 Point Count	☐
ABB1K	PLM EPA 1000 Point Count	☐
ABBEN	PLM EPA NOB	☐
ABBCH	TEM Chatfield	☐
ABBTM	TEM EPA NOB	☐

Air

ABA	PCM NIOSH 7400	☐
ABA-2	OSHA w/ TWA*	☐
ABTEM	TEM AHERA	☐
ABATN	TEM NIOSH 7402	☐
ABT2	TEM Level II	☐

Soil/Vermiculite

ABSE	PLM EPA 600/R-93/116 (Qual.)	☐
ABSP	PLM CARB 435 (LOD <1%)	☐
ABSP1	PLM CARB 435 (LOD 0.25%)	☐
ABSP2	PLM CARB 435 (LOD 0.1%)	☐

Water

ABHE	EPA 100.2	☐

New York ELAP

PLM NY	PLM EPA 600/M4-82-020	☐
ABEPA2	NY ELAP 198.1	☐
ABENY	NY ELAP 198.6 PLM NOB	☐
ABBNY	NY ELAP 198.4 TEM NOB	☐

Dust

ABWA	TEM Wipe ASTM D-6480	☐
ABDMV	TEM Microvac ASTM D-5755	☐

Matrix	Other	
		☐

Turn Around Times				
	3 HR (4 HR TEM) ☐	6 HR (8HR TEM) ☐	12 HR ☐	24 HR ■
	2 Days ☐	3 Days ☐	4 Days ☐	5 Days ☐

Special Instructions INTERIOR

Sample #	Sample Identification/Location	Volume or Area	Sample Type	Flow Rate*	Time* Start – Stop	
	PLEASE SEE ATTACHED SAMPLE LOG					

Relinquished by	Date	Time	Received by	Date	Time
CJS	5/13/21	5:00PM	JAD	5/14/21	9:45 am

Unless scheduled, the turn around time for all samples received after 3 pm EST Friday will begin at 8 am Monday morning. Weekend or Holiday work must be scheduled ahead of time and is charged for rush turn around time. Work with standard turn around time sent Priority Overnight and Billed to Recipient will be charged a $10 shipping fee.

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TriEco

ACM BUILDING SURVEY SAMPLE LOG – INTERIOR

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-01A	TAN 12X12'' VCT	2714 – MAINT. OFFICE
I-01B	TAN 12X12'' VCT	2700, UNIT 2 – KITCHEN
I-02A	TAN 12X12'' SELF ADHESIVE VCT	2714 – MAINT. OFFICE
I-02B	TAN 12X12'' SELF ADHESIVE VCT	2714 – MAINT. OFFICE
I-03A	WHITE CERAMIC TILE / GROUT / MORTAR	2714 – 1ST FL. BATH
I-03B	WHITE CERAMIC TILE / GROUT / MORTAR	2700 – 1ST FL. BATH
I-03C	WHITE CERAMIC TILE / GROUT / MORTAR	2702 – 1ST FL. BATH
I-04A	WHITE GYPSUM BOARD	2702, UNIT 2 – PANTRY
I-04B	WHITE GYPSUM BOARD	2704, UNIT 6 – DINING ROOM
I-04C	WHITE GYPSUM BOARD	2710, UNIT 1 – HVAC CLOSET
I-04D	WHITE GYPSUM BOARD	2710, UNIT 4 – HVAC CLOSET
I-04E	WHITE GYPSUM BOARD	2714, UNIT 3 - PANTRY
I-05A	TAN GYPSUM BOARD MUD	2714, UNIT 3 - PANTRY
I-05B	TAN GYPSUM BOARD MUD	2714 – MAINT. OFFICE
I-05C	TAN GYPSUM BOARD MUD	2702, UNIT 2 – PANTRY
I-05D	TAN GYPSUM BOARD MUD & YELLOW TAPE	2712, UNIT 4 – LIVING ROOM
I-05E	TAN GYPSUM BOARD MUD & TAM TAPE	2704, UNIT 6 – DINING ROOM
I-06A	WHITE GYPSUM BOARD FIRE WALL	2400 – ATTIC
I-06B	WHITE GYPSUM BOARD FIRE WALL	2402 – ATTIC
I-06C	WHITE GYPSUM BOARD FIRE WALL	2410 - ATTIC
I-07A	TAN KITCHEN COUNTERTOP CAULK	2700, UNIT 2 – KITCHEN
I-07B	TAN KITCHEN COUNTERTOP CAULK	2702, UNIT 2 – KITCHEN
I-08A	WHITE BATHROOM SINK CAULK	2710, UNIT 4 – BATHROOM
I-08B	WHITE BATHROOM SINK CAULK	2712, UNIT 4 - BATHROOM
I-09A	WHITE INTERIOR DOOR FRAME CAULK	2710, UNIT 4
I-09B	WHITE INTERIOR WINDOW FRAME CAULK	2702, UNIT 2 – LIVING ROOM
I-09C	WHITE INTERIOR WINDOW FRAME CAULK	2714 – MAINT. OFFICE
I-10A	BLACK COVEBASE & MASTIC	2700, UNIT 2 – 1ST FLOOR BATH
I-10B	BLACK COVEBASE & MASTIC	2700, UNIT 2 – 1ST FLOOR BATH
I-11A	TAN TEXTURED CEILING MUD	2714, UNIT 3 – KITCHEN
I-11B	TAN TEXTURED CEILING MUD	2712, UNIT 4 – KITCHEN
I-11C	TAN TEXTURED CEILING MUD	2700, UNIT 2 – KITCHEN
I-11D	TAN TEXTURED CEILING MUD	2710, UNIT 4 – KITCHEN
I-11E	TAN TEXTURED CEILING MUD	2704, UNIT 6 – DINING ROOM

JAD 5/14/21 9:45am

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ACM BUILDING SURVEY SAMPLE LOG – INTERIOR (CONT.)

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR (CONT.)
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-12A	HVAC DUCT TAPE	2714, UNIT 3 – HVAC CLOSET
I-12B	HVAC DUCT TAPE	2712, UNIT 4 – HVAC CLOSET
I-13A	TAN FORMICA COUTERTOP	2700, UNIT 2 – KITCHEN
I-13B	TAN FORMICA COUTERTOP	2702, UNIT 2 – KITCHEN
I-13C	TAN FORMICA COUTERTOP	2712, UNIT 4 – KITCHEN
I-14A	TAN LINOLEUM W/ PINK DESIGN	2704, UNIT 6
I-14B	TAN LINOLEUM W/ PINK DESIGN	2710, UNIT 4
I-15A	LIGHT GRAY LINOLEUM W/ GRAY TRIANGLE	2704, UNIT 6
I-15B	LIGHT GRAY LINOLEUM W/ GRAY TRIANGLE	2704, UNIT 6
I-16A	TAN LINOLEUM W/ RECTANGLE PATTERN	2714 – MAINT. OFFICE
I-16B	TAN LINOLEUM W/ RECTANGLE PATTERN	2714 – MAINT. OFFICE
I-17A	DARK TAN LINOLEUM	2714, UNIT 3 - ENTRANCE
I-17B	DARK TAN LINOLEUM	2714, UNIT 3 - ENTRANCE
I-18A	WHITE LINOLEUM	2714, UNIT 3 - PANTRY
I-18B	WHITE LINOLEUM	2714, UNIT 3 - PANTRY
I-19A	DARK GRAY WOOD PATTERN LINOLEUM	2710, UNIT 4 – KITCHEN
I-19B	DARK GRAY WOOD PATTERN LINOLEUM	2710, UNIT 4 – KITCHEN
I-20A	BROWN WOOD PATTERN LINOLEUM	2700, UNIT 2 – HVAC CLOSET
I-20B	BROWN WOOD PATTERN LINOLEUM	2700, UNIT 2 – HVAC CLOSET
I-21A	LIGHT BROWN WOOD PATTERN LINOLEUM	2712, UNIT 4 – LAUNDRY RM.
I-21B	LIGHT BROWN WOOD PATTERN LINOLEUM	2712, UNIT 4 – LAUNDRY RM.
I-22A	TAN LINOLEUM	2700, UNIT 2 – ENTRANCE
I-22B	TAN LINOLEUM	2702, UNIT 2 – ENTRANCE

JAD 5/14/21 9:45am

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ACM BUILDING SURVEY SAMPLE LOG – INTERIOR (CONT.)

FACILITY: HOLLY PARK DRIVE
BUILDING # / AREA: INTERIOR (CONT.)
PROJECT #: 210325-G

SAMPLE #	DESCRIPTION	LOCATION
I-23A	BEIGE LINOLEUM	2712, UNIT 4 – HVAC CLOSET
I-23B	BEIGE LINOLEUM	2712, UNIT 4 – HVAC CLOSET
I-24A	LIGHT BROWN LINOLEUM	2700, UNIT 2 – LAUNDRY RM.
I-24B	LIGHT BROWN LINOLEUM	2700, UNIT 2 – LAUNDRY RM.
I-25A	LIGHT TAN LINOLEUM	2710, UNIT 4 – ENTRANCE
I-25B	LIGHT TAN LINOLEUM	2710, UNIT 4 – ENTRANCE

JAD 5/14/21 9:45am

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.

1.2 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

1.3 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1.4 INFORMATIONAL SUBMITTALS

A. Engineering Survey: Submit engineering survey of condition of building.

B. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.

C. Schedule of selective demolition activities with starting and ending dates for each activity.

D. Predemolition photographs or video.

E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician.

1.5 CLOSEOUT SUBMITTALS

A. Inventory of items that have been removed and salvaged.

1.6 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.7 FIELD CONDITIONS

A. Owner will occupy buildings immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is expected that hazardous materials will be encountered in the Work.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

G. Arrange selective demolition schedule so as not to interfere with Owner's operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

3.2 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. Arrange to shut off utilities with utility companies.
3. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3.4 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
2. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
3. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents

of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

4. Maintain fire watch during and for at least (24) hours after flame-cutting operations.
5. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.6 CLEANING

A. Remove demolition waste materials from Project site [and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction. And recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

C. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 061000 - ROUGH CARPENTRY

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. Framing with dimension lumber.
2. Wood blocking and nailers.

1.3 DEFINITIONS

A. Exposed Framing: Framing not concealed by other construction.

B. Dimension Lumber: Lumber of 2 inches nominal or greater but less than 5 inches nominal (114 mm actual) in least dimension.

C. Timber: Lumber of 5 inches nominal or greater in least dimension.

D. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. SPIB: The Southern Pine Inspection Bureau.

1.4 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
2. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
3. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

B. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.

C. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Wood-preservative-treated wood.
2. Power-driven fasteners.
3. Powder-actuated fasteners.
4. Metal framing anchors.

1.5 QUALITY ASSURANCE

A. Source Limitations for Engineered Wood Products: Obtain each type of engineered wood product through one source from a single manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Stack lumber flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

A. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.

1. Factory mark each piece of lumber with grade stamp of grading agency.
2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece.
3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
4. Provide dressed lumber, S4S, unless otherwise indicated.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

A. Preservative Treatment by Pressure Process: AWPA C2, except that lumber that is not in contact with the ground and is continuously protected from liquid water may be treated according to AWPA C31 with inorganic boron (SBX).

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or does not comply with requirements for untreated material.

C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.

D. Application: Treat items indicated on Drawings, and the following:

1. Wood nailers, blocking, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
2. Wood sills, blocking, and similar concealed members in contact with masonry or concrete.
3. Wood floor plates that are installed over concrete slabs-on-grade.

2.3 DIMENSION LUMBER FRAMING

A. Maximum Moisture Content: 19 percent.

B. Framing Members: Construction or No. 2 grade and any of the following species:

1. Mixed southern pine; SPIB.

2.4 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.

B. For items of dimension lumber size, provide Construction or No. 2 grade lumber with 19 percent maximum moisture content of any species.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153 or of Type 304 stainless steel.

B. Nails: ASTM F 1667.

1. Staples are not permitted.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

E. Lag Bolts: ASME B18.2.1.

F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 hex nuts and, where indicated, flat washers.

2.6 METAL FRAMING ANCHORS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

1. Simpson Strong -Tie Co., Inc., or equal.

B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

C. Galvanized Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653, G180 coating designation.

D. Joist Hangers: U-shaped joist hangers with 2-inch- long seat and 1-1/4-inch nailing flanges at least 85 percent of joist depth.

1. Thickness: 0.050 inch.

E. Top Flange Hangers: U-shaped joist hangers, full depth of joist, formed from metal strap with tabs bent to extend over and be fastened to supporting member.

1. Strap Width: 1-1/2 inches.
2. Thickness: 0.050 inch.

F. Provide a 1/2” minimum gap between top plate of non-load bearing walls and bottom chord or trusses. Secure walls to trusses with a “Simpson STC” truss clip or equal at each truss.

1. Typical at all non-load bearing walls.

2.7 MISCELLANEOUS MATERIALS

A. Sill-Sealer Gaskets: Closed-cell neoprene foam, 1/4 inch thick, selected from manufacturer's standard widths to suit width of sill members indicated.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate nailers, blocking, , and similar supports to comply with requirements for attaching other construction.

B. Framing Standard: Comply with AF&PA's "Details for Conventional Wood Frame Construction," unless otherwise indicated.

C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.

D. Metal Framing Anchors: Install metal framing to comply with manufacturer's written instructions.

E. Do not splice structural members between supports, unless otherwise indicated.

F. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.

G. Provide fire blocking in furred spaces, stud spaces, and other concealed cavities as indicated and as follows:

1. Fire block concealed spaces of wood-framed walls and partitions at each floor level, at ceiling line of top story, and at not more than 96 inches o.c. Where fire blocking is not inherent in framing system used, provide closely fitted solid wood blocks of same width as framing members and 2-inch nominal thickness.

H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

I. Comply with AWPA M4 for applying field treatment to cut surfaces of preservative-treated lumber.

1. Use inorganic boron for items that are continuously protected from liquid water.
2. Use copper naphthenate for items not continuously protected from liquid water.

J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:

1. Published requirements of manufacturer.

K. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood; do not countersink nail heads, unless otherwise indicated.

L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.

1. Comply with indicated fastener patterns where applicable.
2. Use finishing nails, unless otherwise indicated. Countersink nail heads and fill holes with wood filler.

3.2 WOOD, BLOCKING, AND NAILER INSTALLATION

A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.

B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces, unless otherwise indicated.

3.3 WALL AND PARTITION FRAMING INSTALLATION

A. General: Provide single bottom plate and double top plates using members of 2-inch nominal (38-mm actual) thickness whose widths equal that of studs, except single top plate may be used for non-load-bearing partitions. Fasten plates to supporting construction, unless otherwise indicated.

1. Provide continuous horizontal blocking at midheight of partitions more than 96 inches high, using members of 2-inch nominal thickness and of same width as wall or partitions.

B. Construct corners and intersections with three or more studs.

C. Frame openings with multiple studs and headers. Provide nailed header members of thickness equal to width of studs. Support headers on jamb studs.

D. Exterior wall sheathing shall span the floor system/ truss. Sheathing shall be attached to floor truss system, to wall below and wall above.

E. Exterior wall sheathing shall span the wall panels horizontally. Sheathing shall extend to adjacent panel and be attached.

3.4 FLOOR JOIST INSTALLATION

A. Joists: Install joists with crown edge up and complying with requirements specified below.

B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.

3.8 PROTECTION

C. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

D. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION

SECTION 061600 - SHEATHING

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. Wall sheathing.
2. Subflooring.
3. Underlayment.
4. Building wrap.

1.3 SUBMITTALS

A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.

1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Indicate type of preservative used and net amount of preservative retained.
2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated plywood complies with requirements. Include physical properties of treated materials.
3. For fire-retardant treatments specified to be High-Temperature (HT) type, include physical properties of treated plywood both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5516.
4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.
5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.
6. For building wrap, include data on air-/moisture-infiltration protection based on testing according to referenced standards.

B. Research/Evaluation Reports: For the following, showing compliance with building code in effect for Project:

1. Preservative-treated plywood.

2. Building wrap.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: For assemblies with fire-resistance ratings, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by a testing and inspecting agency acceptable to authorities having jurisdiction.

1. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory."

1.5 DELIVERY, STORAGE, AND HANDLING

A. Stack plywood and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PANEL PRODUCTS, GENERAL

A. Plywood: DOC PS 1.

B. Oriented Strand Board: DOC PS 2.

C. Factory mark panels to indicate compliance with applicable standard.

2.2 PRESERVATIVE-TREATED PLYWOOD

A. Preservative Treatment by Pressure Process: AWPA C9.

1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.

B. Mark plywood with appropriate classification marking of an inspection agency acceptable to authorities having jurisdiction.

C. Application: Treat items indicated on Drawings.

2.3 WALL SHEATHING

A. Oriented-Strand-Board Wall Sheathing: APA Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 32/16.
2. Nominal Thickness: Not less than indicated on drawings.

2.4 SUBFLOORING AND UNDERLAYMENT

A. Oriented-Strand-Board Subflooring: Exposure 1, Structural I sheathing.

1. Span Rating: Not less than 16 o.c.
2. Nominal Thickness: Not less than indicated on drawings.
3. Tongue and groove edge.

B. Underlayment, General: Provide underlayment in nominal thicknesses indicated or, if not indicated, not less than 1/4 inch (6.4 mm) over smooth subfloors and not less than 3/8 inch (9.5 mm) over uneven subfloors.

1. Underlayment shall be APA grade with sanded face. Confirm that underlayment is compatible with adhesives used by resilient floor manufacturer.

2.5 FASTENERS

A. General: Provide fasteners of size and type indicated that comply with requirements specified in this Article for material and manufacture.

1. For roof and wall sheathing, provide coated, corrosion resistant fasteners suitable for the installation, complying with all applicable requirements and Codes, for allowable loads, withdrawal resistance, lateral strength, etc.

B. Nails: ASTM F 1667.

1. Staples are not permitted.

C. Power-Driven Fasteners: NES NER-272.

D. Wood Screws: ASME B18.6.1.

2.6 BUILDING WRAP

A. Building Wrap: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. DuPont (E. I. du Pont de Nemours and Company); Tyvek
b. Or equal.

2. Water-Vapor Permeance: Not less than **152** g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).
3. Allowable UV Exposure Time: Not less than three months.

B. Building-Wrap Tape: Pressure-sensitive plastic tape recommended by building-wrap manufacturer for sealing joints and penetrations in building wrap.

2.7 MISCELLANEOUS MATERIALS

A. Adhesives for Field Gluing Panels to Framing: Formulation complying with ASTM D 3498 that is approved for use with type of construction panel indicated by manufacturers of both adhesives and panels.

1. Use adhesives that have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Do not use materials with defects that impair quality of sheathing or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

B. Cut panels at penetrations, edges, and other obstructions of work; fit tightly against abutting construction, unless otherwise indicated.

C. Securely attach to substrate by fastening as indicated, complying with the following:

1. Published requirements or metal framing anchor manufacturer.

D. Use common wire nails, unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections. Install fasteners without splitting wood.

E. Coordinate wall and roof sheathing installation with flashing and joint-sealant installation so these materials are installed in sequence and manner that prevent exterior moisture from passing through completed assembly.

F. Do not bridge building expansion joints; cut and space edges of panels to match spacing of structural support elements.

G. Coordinate sheathing installation with installation of materials installed over sheathing so sheathing is not exposed to precipitation or left exposed at end of the workday when rain is forecast.

3.2 WOOD STRUCTURAL PANEL INSTALLATION

A. General: Comply with applicable recommendations in APA Form No. E30S, "Engineered Wood Construction Guide," for types of structural-use panels and applications indicated.

B. Fastening Methods: Fasten panels as indicated below:

1. Subflooring:

a. Glue and screw to wood framing.

b. Space panels 1/8 inch (3 mm) apart at edges and ends.

2. Wall and Roof Sheathing:

a. Nail or screw to wood framing. Apply a continuous bead of glue to framing members at edges of wall sheathing panels.
b. Space panels 1/8 inch (3 mm) apart at edges and ends.
c. Provide 18 ga. Galvanized roof sheathing clips installed between panels; spaced per manufacturers recommendations.

3. Underlayment:

a. Screw to subflooring.
b. Fill and sand edge joints, and fastener heads, of underlayment receiving resilient flooring right before installing flooring.
c. Provide 18 gauge galvanized steel roof sheathing clips installed between panels; spaced per manufacturer’s recommendations.

3.3 BUILDING WRAP INSTALLATION

A. General: Cover sheathing as follows:

B. Building Wrap: Comply with manufacturer's written instructions.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

END OF SECTION

SECTION 062023 - INTERIOR FINISH CARPENTRY

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. Interior standing and running trim.
2. Interior stairs and railings

1.3 DEFINITIONS

A. Lumber grading agencies, and the abbreviations used to reference them, include the following:

1. NeLMA: Northeastern Lumber Manufacturers' Association.
2. NHLA: National Hardwood Lumber Association.
3. NLGA: National Lumber Grades Authority.
4. SPIB: The Southern Pine Inspection Bureau.

1.4 QUALITY ASSURANCE

B. Installer Qualifications: Arrange for installation of finish carpentry by a firm that can demonstrate successful experience in installing finish carpentry items similar in type and quality to those required for this project.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect materials against weather and contact with damp or wet surfaces. Stack lumber, plywood, and other panels flat with spacers between each bundle to provide air circulation. Provide for air circulation within and around stacks and under temporary coverings.

B. Deliver interior finish carpentry materials only when environmental conditions meet requirements specified for installation areas. If interior finish carpentry materials must be stored in other than installation areas, store only where environmental conditions meet requirements specified for installation areas.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install interior finish carpentry materials until building is enclosed and weatherproof, wet work in space is completed and nominally dry, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Do not install finish carpentry materials that are wet, moisture damaged, or mold damaged.

1. Indications that materials are wet or moisture damaged include, but are not limited to, discoloration, sagging, or irregular shape.
2. Indications that materials are mold damaged include, but are not limited to, fuzzy or splotchy surface contamination and discoloration.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Lumber: DOC PS 20 and applicable grading rules of inspection agencies certified by ALSC's Board of Review.

1. Factory mark each piece of lumber with grade stamp of inspection agency indicating grade, species, moisture content at time of surfacing, and mill.
2. For exposed lumber, mark grade stamp on end or back of each piece.

2.2 SCHEDULE

A. Trim: For trim in form of boards and worked products, provide lumber complying with the following requirements. For trim to receive painted finish, the Contractor shall have option to provide finger-jointed trim.

1. Casing shall be WM 356, 11/16 x 2-1/4.
2. Window Return moulding shall be 1 ¼” x 2” Alexandria.
3. Window Stool shall be WM 1022, 11/16 x 4-1/2.
4. Window Stool shall be WM 1099, 11/16 x 2-1/2
5. Window Skirt shall be WM 327, 11/16 x 2-1/4.
6. Base moulding shall be WM 623, 9/16 x 3-1/4.
3. Base shoe shall be WM 126, ½ x ¾. Base shoe shall be used at all locations where carpet is not provided.
4. Handrail shall be WM 230, 1-1/2 x 1-11/16, solid oak finished to match stair tread.
5. Treads – No. 1 common, no knots, red oak.
6. Risers and miscellaneous trim shall be as shown on the drawings.

2.3 MISCELLANEOUS MATERIALS

A. Fasteners for Interior Finish Carpentry: Nails, screws, and other anchoring devices of type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible.

B. Glue: Aliphatic-resin, polyurethane, or resorcinol wood glue recommended by manufacturer for general carpentry use.

1. Use wood glue that has a VOC content of 30 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

C. Multipurpose Construction Adhesive: Formulation complying with ASTM D 3498 that is recommended for indicated use by adhesive manufacturer.

1. Use adhesive that has a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).

2.4 FABRICATION

A. Back out or kerf backs of the following members except those with ends exposed in finished work:

1. Interior standing and running trim except shoe mould.

B. Ease edges of lumber less than 1 inch (25 mm) in nominal thickness to 1/16-inch (1.5-mm) radius and edges of lumber 1 inch (25 mm) or more in nominal thickness to 1/8-inch (3-mm) radius.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.

B. Examine finish carpentry materials before installation. Reject materials that are wet, moisture damaged, and mold damaged.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

B. Before installing interior finish carpentry, condition materials to average prevailing humidity in installation areas for a minimum of 24 hours unless longer conditioning is recommended by manufacturer.

3.3 INSTALLATION, GENERAL

A. Do not use materials that are unsound, warped, improperly treated or finished, inadequately seasoned, or too small to fabricate with proper jointing arrangements.

1. Do not use manufactured units with defective surfaces, sizes, or patterns.

B. Install interior finish carpentry level, plumb, true, and aligned with adjacent materials. Use concealed shims where necessary for alignment.

1. Scribe and cut interior finish carpentry to fit adjoining work. Refinish and seal cuts as recommended by manufacturer.
2. Countersink fasteners, fill surface flush, and sand where face fastening is unavoidable.
3. Install to tolerance of 1/8 inch in 96 inches (3 mm in 2438 mm) for level and plumb. Install adjoining interior finish carpentry with 1/32-inch (0.8-mm) maximum offset for flush installation and 1/16-inch (1.5-mm) maximum offset for reveal installation.
4. Coordinate interior finish carpentry with materials and systems in or adjacent to it. Provide cutouts for mechanical and electrical items that penetrate interior finish carpentry.

3.4 STANDING AND RUNNING TRIM INSTALLATION

A. Install with minimum number of joints practical, using full-length pieces from maximum lengths of lumber available. Do not use pieces less than 24 inches (610 mm) long, except where necessary. Stagger joints in adjacent and related standing and running trim. Cope at returns and miter at corners to produce tight-fitting joints with full-surface contact throughout length of joint. Use scarf joints for end-to-end joints. Plane backs of casings to provide uniform thickness across joints where necessary for alignment.

1. Install trim after gypsum board joint finishing operations are completed.
2. Drill pilot holes in hardwood before fastening to prevent splitting. Fasten to prevent movement or warping. Countersink fastener heads on exposed carpentry work and fill holes.

3.5 ADJUSTING

A. Replace interior finish carpentry that is damaged or does not comply with requirements. Interior finish carpentry may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing. Adjust joinery for uniform appearance.

3.6 PROTECTION

A. Protect installed products from damage from weather and other causes during remainder of the construction period.

B. Remove and replace finish carpentry materials that are wet, moisture damaged, and mold damaged.

END OF SECTION

SECTION 072100 - THERMAL INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Loose-fill building insulation.
2. Glass fiber blanket insulation

1.2 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: Full-size units for each type of exposed insulation indicated.

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide insulation and related materials with the fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84 for surface-burning characteristics and other methods indicated with product, by UL or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify materials with appropriate markings of applicable testing and inspecting agency.

PART 2 - PRODUCTS

2.1 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.

2.2 LOOSE-FILL INSULATION

A. Cellulosic-Fiber Loose-Fill Insulation: ASTM C 739, chemically treated for flame-resistance, processing, and handling characteristics or,

B. Glass-Fiber Loose-Fill Insulation: ASTM C 764, Type I for pneumatic application; with maximum flame-spread and smoke-developed indexes of 5.

2.3 GLASS-FIBER BLANKET INSULATION

A. Available Manufacturers:

1. Owens Corning, or equal.

B. Faced, Glass-Fiber Blanket Insulation: ASTM C 665, Type II, with Kraft facing, Class C.

2.4 AUXILIARY INSULATING MATERIALS

A. Eave Ventilation Troughs: Preformed, rigid fiberboard or plastic sheets designed and sized to fit between roof framing members and to provide cross ventilation between insulated attic spaces and vented eaves.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

A. Comply with insulation manufacturer's written instructions applicable to products and application indicated.

B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed at any time to ice, rain, and snow.

C. Extend insulation in thickness required to achieve R-value indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.

D. Water-Piping Coordination: If water piping is located within insulated exterior walls, coordinate location of piping to ensure that it is placed on warm side of insulation and insulation encapsulates piping.

3.2 INSTALLATION OF GENERAL BUILDING INSULATION

A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.

B. Place loose-fill insulation into spaces indicated to comply with ASTM C 1015. Level horizontal applications to uniform thickness as indicated, lightly settle to uniform density, but do not compact excessively.

1. For cellulosic-fiber loose-fill insulation, comply with the Cellulose Insulation Manufacturers Association's Special Report #3, "Standard Practice for Installing Cellulose Insulation."

C. Apply self-supported, spray-applied cellulosic insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make it flush with face of studs by using method recommended by insulation manufacturer.

D. Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).

3.3 PROTECTION

A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION

SECTION 072630 – SPRAY APPLIED FOAM CAVITY-WALL INSULATION

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. Spray-applied polyurethane foam (SPF) insulation air-barrier, closed-cell, for exterior assemblies.

1.3 PERFORMANCE REQUIREMENTS

A. Spray Polyurethane Foam: Material shall meet requirements of ULC S705.1, Standard for Thermal Insulation - Spray Applied Rigid Polyurethane Foam, Medium Density - Material - Specification. CCMC Evaluation Report or reports from accredited testing laboratory shall be made available upon request. Materials shall meet or exceed the following performance requirements as indicated in the test reports.

1. R-Value: 5.8 (min) @ 1” thickness per ASTM C-518.

1.3 SUBMITTALS

A. Product Data: Submit manufacturer’s product data, manufacturer's printed instructions for evaluating, preparing, and treating substrate, temperature and other limitations of installation conditions, technical data, and tested physical and performance properties.

1. Submit letter from primary materials manufacturer indicating approval of products not manufactured by primary manufacturer.
2. Include statement that materials are compatible with adjacent materials proposed for use.
3. Submit reports indicating that field peel-adhesion test on all materials to which sealants are adhered have been performed and the changes made, if required, to other approved materials, in order to achieve successful adhesion.

B. Samples: Submit labeled samples, 3 by 4 inch (75 mm by 100 mm) minimum size of each material specified.

C. Shop Drawings: Submit shop drawings showing locations and extent of air barrier assemblies and details of typical conditions. Drawings shall indicate manufacturer’s recommended closures of gaps in wall construction, counter-flashings, integrity of insulation thickness at corners, and sealing of miscellaneous conduit, piping, electrical rough-in boxes and similar items are sealed.

D. Compatibility: Submit letter from manufacturer stating that materials proposed for use are permanently chemically compatible and adhesively compatible with adjacent materials proposed for use. Submit letter from manufacturer stating that cleaning materials used during installation are chemically compatible with adjacent materials proposed for use.

1.4 QUALITY ASSURANCE

A. Subcontractor Qualifications:

1. Installer shall be certified by BPQI (Building Performance Quality Institute) in accordance with the training requirements outlined in the ULC S705.2-05 Installation Standard.

2. Installer shall have at least 3-years of successful experience in application of spray polyurethane foam. Installer must be a NCIF Gola Star certified insulation contractor or have SPF manufacturer's certification for the application.

B. Equipment: Installer shall have equipment to spray-apply polyurethane foam including, but not limited to, high pressure plural component proportioning pump, heated hoses of suitable length, spray gun, drum pumps or other ancillary equipment necessary for the Project.

C. Manufacturer: Obtain primary materials from a single manufacturer regularly engaged in manufacturing air barrier membranes. Obtain secondary materials from a source acceptable to the primary materials manufacturer.

D. Accredited Laboratory Testing for Materials: Laboratory accredited by International Accreditation Service Inc. (IAS), American Association for Laboratory Accreditation (A2LA), or the Standards Council of Canada (SCC).

E. Field Quality Assurance: Do not cover until inspected and accepted.

F. Preconstruction Meeting: Agenda shall include, sequence of construction, coordination with substrate preparation, materials approved for use, compatibility of materials, coordination with installation of adjacent and covering materials, and details of construction.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to Project site in original packages or containers with seals unbroken, labeled with manufacturer's name, product, date of manufacture, and directions for storage.

B. Store materials in their original undamaged packages or containers in a clean, dry, protected location and within temperature range required by air barrier membrane manufacturer. Protect stored materials from direct sunlight.

C. Handle materials in accordance with manufacturer's recommendations.

1.6 PROJECT CONDITIONS

A. Temperature: Install air barrier within range of ambient and substrate temperatures recommended by air barrier manufacturer. Do not apply air barrier to a damp or wet substrate.

B. Field Conditions: Do not install air barrier in snow, rain, fog, or mist. Do not install air barrier when the temperature of substrate surfaces and surrounding air temperatures are below those recommended by the manufacturer.

1.7 WARRANTY

A. Material Warranty: Provide manufacturer's standard product warranty, for a minimum 3 years from date of Final Completion.

B. Installation Warranty: Provide air barrier subcontractor's 2 year warranty from date of Final Completion, including all components of the air barrier assembly, against failures including loss of air tight seal, loss of watertight seal, loss of adhesion, loss of cohesion, failure to cure properly.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Spray Polyurethane Foam Air Barrier: Spray-applied proprietary materials as specified. Subject to compliance with requirements, provide one of the following:

1. HEATLOK SOY 200, or equal

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions under which spray polyurethane foam assemblies will be applied, with installer present, for compliance with requirements.

1. Verify that surfaces and conditions are suitable prior to commencing work. Do not proceed with installation until unsatisfactory conditions have been corrected.
2. Do not proceed with installation until after minimum concrete curing period recommended by air barrier manufacturer.
3. Ensure that the following conditions are met:

a. Surfaces are sound, dry, even, and free of oil, grease, dirt, excess mortar or other contaminants.
b. Surfaces are cured and dry, smooth without large voids, spalled areas or sharp protrusions.

4. Verify substrate is visibly dry and free of moisture. Test for capillary moisture by plastic sheet method according to ASTM D 4263 and take suitable measures until substrate passes moisture test.
5. Verify sealants used in sheathing are compatible with membrane proposed for use. Perform field peel-adhesion test on materials to which sealants are adhered.
6. Notify Architect in writing of anticipated problems using air barrier over substrate prior to proceeding.

3.2 SURFACE PREPARATION

A. Clean, prepare, and treat substrate according to manufacturer's written instructions. Provide clean, dust-free, and dry substrate for spray polyurethane foam.

1. Ensure that penetrating work by other trades is in place and complete.
2. Prepare surfaces by brushing, scrubbing, scraping, or grinding to remove loose mortar, dust, oil, grease, oxidation, mill scale and other contaminants, which may affect adhesion of the spray polyurethane foam.
3. Wipe down metal surfaces to remove release agents or other non-compatible coatings, using clean sponges or rags soaked in a solvent compatible with the spray polyurethane foam.
4. Test substrate with Moisture Detection Paper (MDP) strips to affirm that the substrate is dry.

B. Protection from Spray Applied Materials:

1. Mask and cover adjacent areas to protect from over spray.
2. Ensure any required foam stop or back up material are in place to prevent over spray and achieve complete seal.
3. Seal off existing ventilation equipment. Install temporary ducting and fans to ensure exhaust fumes. Provide for make-up air.
4. Erect barriers, isolate area and post warning signs to advise non-protected personnel to avoid the spray area.

3.3 INSTALLATION

A. Spray Application of Polyurethane: Install materials in accordance with manufacturer's recommendations, and printed instructions

3.4 PROTECTING AND CLEANING

A. Protect spray polyurethane foam air barrier assemblies from damage during application and remainder of construction period, according to manufacturer's written instructions.

1. Coordinate with installation of materials which cover spray polyurethane foam air barrier, to ensure exposure period does not exceed that recommended by the manufacturer.

B. Clean all spillage and soiling from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction and acceptable to the primary material manufacturer.

END OF SECTION

SECTION 074633 - PLASTIC SIDING

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 vinyl siding, soffit and trim.

B. Air Infiltration Barrier.

1.3 COORDINATION

A. Coordinate siding installation with flashings and other adjoining construction to ensure proper sequencing.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For vinyl siding Installer.

B. Product Certificates: For each type of vinyl siding and soffit.

C. Sample Warranty:

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For each type of product, including related accessories, to include in maintenance manuals.

1.8 MAINTENANCE MATERIAL SUBMITTALS

A. Not Required

1.9 QUALITY ASSURANCE

A. Vinyl Siding Installer Qualifications: A qualified installer who employs a VSI-certified Installer on Project.

B. Installers Qualifications: Contractor is to utilize workers that are familiar with their work and may provide a documented history of 3-years of similar work. They must also be able to demonstrate familiarity with the manufacturer's standards.

1.10 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store packaged materials in original containers with labels intact until time of use.

B. Store materials under cover.

1.11 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace products that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures including cracking, fading, and deforming.
b. Deterioration of materials beyond normal weathering.

2. Warranty Period: 50 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Source Limitations: Obtain products, including related accessories, from single source from single manufacturer.

2.2 VINYL SIDING

A. Vinyl Siding: Integrally colored product complying with ASTM D 3679.

B. Pattern, Texture, Nominal Thickness, Minimum Profile Depth and Color: Match existing.

2.3 VINYL SOFFIT

A. Vinyl Soffit: Integrally colored product complying with ASTM D 4477.

B. Pattern, Texture, Ventilation, Nominal Thickness, Minimum Profile Depth and Color: Match existing.

2.4 TRIM

A. Provide Fiber cement trim boards in sizes indicated in drawings and as described below.

1. Surface: Primed on all four sides with one face smooth and one face textured. Exposed flutes not acceptedable.
2. Size: Boards shall be nominal 5/4" (inch) thickness in sizes indicated on drawings, unless otherwise noted.
3. Installation: Per manufacturer's printed installation instructions.
4. Finish: Field painted per manufacturer's printed instructions.

2.5 ACCESSORIES

A. Siding Accessories, General: Provide starter strips, edge trim, outside and inside corner caps, and other items as recommended by siding manufacturer for building configuration.

1. Provide accessories matching existing.

B. Vinyl Accessories: Integrally colored vinyl accessories complying with ASTM D 3679 except for wind-load resistance.

C. Fasteners:

1. For fastening to wood, use siding nails of sufficient length to penetrate a minimum of 1 inch into substrate, as recommended by siding manufacturer
2. For fastening vinyl, use aluminum hot-dip galvanized stainless-steel fasteners, as recommended by siding manufacturer. Where fasteners are exposed to view, use prefinished aluminum fasteners in color to match item being fastened.

2.6 AIR INFILTRATION BARRIER

A. Air Infiltration Barrier: ASTM E 1677, Type I air retarder; with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, when tested according to ASTM E 84; UV stabilized; and acceptable to authorities having jurisdiction.

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:

a. Tyvek
b. Or equal.

2. Water-Vapor Permeance: Not less than **152** g through 1 sq. m of surface in 24 hours per ASTM E 96, Desiccant Method (Procedure A).
3. Allowable UV Exposure Time: Not less than three months.

B. Tape: Pressure-sensitive plastic tape recommended by manufacturer for sealing joints and penetrations in air infiltration barrier.

2.7 AIR INFILTRATION BARRIER INSTALLATION

A. General: Cover sheathing per manufacturer's written instructions.

1. Seal seams, edges, fasteners, and penetrations with tape.
2. Extend into jambs of openings and seal corners with tape.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates for compliance with requirements for installation tolerances and other conditions affecting performance of vinyl siding and soffit and related accessories.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean substrates of projections and substances detrimental to application.

3.3 INSTALLATION

A. General: Comply with manufacturer's written installation instructions applicable to products and applications indicated unless more stringent requirements apply.

1. Center nails in elongated nailing slots without binding siding to allow for thermal movement.

B. Install vinyl siding and soffit and related accessories according to ASTM D 4756.

3.4 ADJUSTING AND CLEANING

A. Remove damaged, improperly installed, or otherwise defective materials and replace with new materials complying with specified requirements.

B. Clean finished surfaces according to manufacturer's written instructions and maintain in a clean condition during construction.

END OF SECTION 074633

SECTION 076200 - SHEET METAL FLASHING AND TRIM

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 sheet metal flashing and trim in the following categories:

1. Roof-drainage systems.
2. Sheet metal flashing.

1.3 PERFORMANCE REQUIREMENTS

A. General: Install sheet metal flashing and trim to withstand wind loads, structural movement, thermally induced movement, and exposure to weather without failing.

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 including manufacturer's material and finish data, installation instructions, and general recommendations for each specified flashing material and fabricated product.

C. Shop Drawings of each item specified showing layout, profiles, methods of joining, and anchorage details.

D. Samples of sheet metal flashing, trim, and accessory items, in the specified finish. Where finish involves normal color and texture variations, include Sample sets composed of 2 or more units showing the full range of variations expected.

1. 8-inch- (200-mm-) square Samples of specified sheet materials to be exposed as finished surfaces.
2. 12-inch- (300-mm-) long Samples of factory-fabricated products exposed as finished Work. Provide complete with specified factory finish.

E. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experience Installer who has completed sheet metal flashing and trim work similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

1.6 PROJECT CONDITIONS

A. Coordinate Work of this Section with interfacing and adjoining Work for proper sequencing of each installation. Ensure best possible weather resistance, durability of Work, and protection of materials and finishes.

PART 2 - PRODUCTS

2.1 METALS

A. Aluminum: Alloy and temper recommended by aluminum producer and finisher for type of use and finish indicated and with not less than the strength and durability of alloy and temper designated below:

2.2 MISCELLANEOUS MATERIALS AND ACCESSORIES

A. Fasteners: Same metal as sheet metal flashing or other noncorrosive metal as recommended by sheet metal manufacturer. Match finish of exposed heads with material being fastened.

B. Asphalt Mastic: SSPC-Paint 12, solvent-type asphalt mastic, nominally free of sulfur and containing no asbestos fibers, compounded for 15-mil (0.4-mm) dry film thickness per coat.

C. Mastic Sealant: Polyisobutylene; nonhardening, nonskinning, nondrying, nonmigrating sealant.

D. Elastomeric Sealant: Generic type recommended by sheet metal manufacturer and fabricator of components being sealed and complying with requirements for joint sealants as specified in Division 7 Section "Joint Sealants."

E. Adhesives: Type recommended by flashing sheet metal manufacturer for waterproof and weather-resistant seaming and adhesive application of flashing sheet metal.

F. Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for complete installation of Work, matching or compatible with material being installed; noncorrosive; size and thickness required for performance.

G. Roofing Cement: ASTM D 4586, Type I, asbestos free, asphalt based.

2.3 FABRICATION, GENERAL

A. Sheet Metal Fabrication Standard: Fabricate sheet metal flashing and trim to comply with recommendations of SMACNA's "Architectural Sheet Metal Manual" that apply to the design, dimensions, metal, and other characteristics of the item indicated.

B. Comply with details shown to fabricate sheet metal flashing and trim that fit substrates and result in waterproof and weather-resistant performance once installed. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Form exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems.

D. Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contact with asphalt mastic or other permanent separation as recommended by manufacturer.

E. Conceal fasteners and expansion provisions where possible. Exposed fasteners are not allowed on faces of sheet metal exposed to public view.

F. Fabricate cleats and attachment devices from same material as sheet metal component being anchored or from compatible, noncorrosive metal recommended by sheet metal manufacturer.

1. Size: As recommended by SMACNA manual or sheet metal manufacturer for application but never less than thickness of metal being secured.

2.4 SHEET METAL FABRICATIONS

A. General: Fabricate sheet metal items in thickness or weight needed to comply with performance requirements but not less than that listed below for each application and metal.

B. Gutters: Fabricate from the following material: Gutters shall be seamless.

1. Aluminum: 0.0320 inch (0.8 mm) thick.
2. Size: As indicated on drawings.

C. Downspouts: Fabricate from the following material:

1. Aluminum: 0.024 inch (0.6 mm) thick.
2. Size: As indicated on drawings.

D. Flashing

1. Provide flashing in areas shown/noted in the drawings.
2. Provide pre-finished flashing where exposed.

3. Fabricate from the following material:

a. Aluminum: 0.0320 inch thick.

3.1 ALUMINUM FINISHES

A. General: Comply with Aluminum Association's (AA) "Designation System for Aluminum Finishes" for finish designations and application recommendations.

B. Provide manufacturer's standard baked-on, acrylic shop finish on sheet metal units (gutters, downspouts, flashing and similar exposed units); 1.0-mil (0.025-mm) dry film thickness.

PART 3 - EXECUTION

4.1 EXAMINATION

A. Examine substrates and conditions under which sheet metal flashing and trim are to be installed and verify that Work may properly commence. Do not proceed with installation until unsatisfactory conditions have been corrected.

4.2 INSTALLATION

A. General: Unless otherwise indicated, install sheet metal flashing and trim to comply with performance requirements, manufacturer's installation instructions, and SMACNA's "Architectural Sheet Metal Manual." Anchor units of Work securely in place by methods indicated, providing for thermal expansion of metal units; conceal fasteners where possible, and set units true to line and level as indicated. Install Work with laps, joints, and seams that will be permanently watertight and weatherproof.

B. Install exposed sheet metal Work that is without excessive oil canning, buckling, and tool marks and that is true to line and levels indicated, with exposed edges folded back to form hems. Install sheet metal flashing and trim to fit substrates and to result in waterproof and weather-resistant performance. Verify shapes and dimensions of surfaces to be covered before fabricating sheet metal.

C. Separations: Separate metal from noncompatible metal or corrosive substrates by coating concealed surfaces, at locations of contact, with asphalt mastic or other permanent separation as recommended by manufacturer.

1. Bed flanges of Work in a thick coat of roofing cement where required for waterproof performance.

D. Roof-Drainage System: Install drainage items fabricated from sheet metal, with straps, adhesives, and anchors recommended by SMACNA's Manual or the item manufacturer, to drain roof in the most efficient manner. Coordinate roof-drain

flashing installation with roof-drainage system installation. Coordinate flashing and sheet metal items for steep-sloped roofs with roofing installation.

4.3 CLEANING AND PROTECTION

A. Clean exposed metal surfaces, removing substances that might cause corrosion of metal or deterioration of finishes.

B. Provide final protection and maintain conditions that ensure sheet metal flashing and trim Work during construction is without damage or deterioration other than natural weathering at the time of Completion.

END OF SECTION

SECTION 078413 - PENETRATION FIRESTOPPING

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 through-penetration firestop systems for penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items.

1.3 PERFORMANCE REQUIREMENTS

A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

B. Rated Systems: Provide through-penetration firestop systems with the following ratings determined per ASTM E 814:

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of constructions penetrated.
2. T-Rated Systems: For the following conditions, provide through-penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupiable floor areas:

    a. Penetrations located outside wall cavities.
    b. Penetrations located outside fire-resistance-rated shaft enclosures.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For penetrations involving insulated piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For through-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 450, respectively, as determined per ASTM E 84.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Through-Penetration Firestop System Schedule: Indicate locations of each through-penetration firestop system, along with the following information:

1. Types of penetrating items.
2. Types of constructions penetrated, including fire-resistance ratings and, where applicable, thicknesses of construction penetrated.
3. Through-penetration firestop systems for each location identified by firestop design designation of qualified testing and inspecting agency.

C. Qualification Data: For Installer.

D. Product Certificates: For through-penetration firestop system products, signed by product manufacturer.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: A firm experienced in installing through-penetration firestop systems similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful performance.

B. Installation Responsibility: Assign installation of through-penetration firestop systems in Project to a single qualified installer.

C. Fire-Test-Response Characteristics: Provide through-penetration firestop systems that comply with the following requirements and those specified in Part 1 "Performance Requirements" Article:

1. Firestopping tests are performed by a qualified testing and inspecting agency. A qualified testing and inspecting agency is UL**,** or another agency performing testing and follow-up inspection services for firestop systems acceptable to authorities having jurisdiction.
2. Through-penetration firestop systems are identical to those tested per testing standard referenced in "Part 1 Performance Requirements" Article. Provide rated systems complying with the following requirements:

a. Through-penetration firestop system products bear classification marking of qualified testing and inspecting agency.
b. Through-penetration firestop systems correspond to those indicated by reference to through-penetration firestop system designations listed by the following:

1) UL in its "Fire Resistance Directory."

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver through-penetration firestop system products to Project site in original, unopened containers or packages with intact and legible manufacturers' labels identifying product and manufacturer, date of manufacture, lot number, shelf life if applicable, qualified testing and inspecting agency's classification marking applicable to Project, curing time, and mixing instructions for multicomponent materials.

B. Store and handle materials for through-penetration firestop systems to prevent their deterioration or damage due to moisture, temperature changes, contaminants, or other causes.

1.7 PROJECT CONDITIONS

A. Environmental Limitations: Do not install through-penetration firestop systems when ambient or substrate temperatures are outside limits permitted by through-penetration firestop system manufacturers or when substrates are wet due to rain, frost, condensation, or other causes.

B. Ventilate through-penetration firestop systems per manufacturer's written instructions by natural means or, where this is inadequate, forced-air circulation.

1.8 COORDINATION

A. Coordinate construction of openings and penetrating items to ensure that through-penetration firestop systems are installed according to specified requirements.

B. Coordinate sizing of sleeves, openings, core-drilled holes, or cut openings to accommodate through-penetration firestop systems.

C. Do not cover up through-penetration firestop system installations that will become concealed behind other construction until each installation has been examined by building inspector, if required by authorities having jurisdiction.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:
   1. Hilti, Inc.
   2. Johns Manville.
   3. 3M; Fire Protection Products Division.
   4. Or equal.

2.2 FIRESTOPPING, GENERAL

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

1. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved by qualified testing and inspecting agency for firestop systems indicated.

2. Provide firestop systems for each kind of penetration and construction indicated from a single manufacturer.

2.3 FILL MATERIALS

A. General: Provide through-penetration firestop systems containing the types of fill materials indicated in the Through-Penetration Firestop System Schedule at the end of Part 3 by referencing the types of materials described in this Article. Fill materials are those referred to in directories of referenced testing and inspecting agencies as "fill," "void," or "cavity" materials.

B. Latex Sealants: Single-component latex formulations that after cure do not re-emulsify during exposure to moisture.

C. Firestop Devices: Factory-assembled collars formed from galvanized steel and lined with intumescent material sized to fit specific diameter of penetrant.

D. Intumescent Composite Sheets: Rigid panels consisting of aluminum-foil-faced elastomeric sheet bonded to galvanized steel sheet.

E. Intumescent Putties: Nonhardening dielectric, water-resistant putties containing no solvents, inorganic fibers, or silicone compounds.

F. Intumescent Wrap Strips: Single-component intumescent elastomeric sheets with aluminum foil on one side.

G. Mortars: Prepackaged dry mixes consisting of a blend of inorganic binders, hydraulic cement, fillers, and lightweight aggregate formulated for mixing with water at Project site to form a nonshrinking, homogeneous mortar.

H. Silicone Foams: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

I. Silicone Sealants: Single-component, silicone-based, neutral-curing elastomeric sealants of grade indicated below:

1. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces, and nonsag formulation for openings in vertical and other

surfaces requiring a nonslumping, gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

2.4 MIXING

A. For those products requiring mixing before application, comply with through-penetration firestop system manufacturer's written instructions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other items or procedures needed to produce products of uniform quality with optimum performance characteristics for application indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions, with Installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of work.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with firestop system manufacturer's written instructions and with the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.
2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.
3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

3.4 FIELD QUALITY CONTROL

A. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

B. Proceed with enclosing through-penetration firestop systems with other construction only after inspection reports are issued and firestop installations comply with requirements.

3.5 CLEANING AND PROTECTING

A. Clean off excess fill materials adjacent to openings as Work progresses by methods and with cleaning materials that are approved in writing by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation that ensure that through-penetration firestop systems are without damage or deterioration at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce systems complying with specified requirements.

END OF SECTION 078413

SECTION 079200 - JOINT SEALANTS

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 joint sealants for the following applications, including those specified by reference to this Section:

1. Exterior joints in vertical surfaces and horizontal nontraffic surfaces.

2. Exterior joints in horizontal traffic surfaces.

3. Interior joints in vertical surfaces and horizontal nontraffic surfaces.

4. Interior joints in horizontal traffic surfaces.

1.3 PERFORMANCE REQUIREMENTS

A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

B. Provide joint sealants for interior applications that establish and maintain airtight and water-resistant continuous joint seals without staining or deteriorating joint substrates.

1.4 SUBMITTALS

A. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Manufacturer's authorized Installer who is approved or licensed for installation of elastomeric sealants required for this Project.

B. Source Limitations: Obtain each type of joint sealant through one source from a single manufacturer.

1.6 PROJECT CONDITIONS

A. Do not proceed with installation of joint sealants under the following conditions:

1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer or are below 40 deg F (5 deg C).
2. When joint substrates are wet.
3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.

B. VOC Content of Interior Sealants: Provide interior sealants and sealant primers that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Sealants: 250 g/L.
2. Sealant Primers for Nonporous Substrates: 250 g/L.
3. Sealant Primers for Porous Substrates: 775 g/L.

C. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.2 ELASTOMERIC JOINT SEALANTS

A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.

B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.

2.3 JOINT-SEALANT BACKING

A. General: Provide sealant backings of material and type that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are

approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). 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.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

2.4 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:

1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant

manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.

2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

    a. Concrete.
    b. Masonry.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.

B. Joint Priming: Prime joint substrates, where recommended by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions. Confine primers to areas of joint-sealant bond; do not allow spillage or migration onto adjoining surfaces.

C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.3 INSTALLATION OF JOINT SEALANTS

A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.

B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.

a. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.5 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.6 JOINT-SEALANT SCHEDULE

A. Provide joint sealants of the type are indicated and locations noted:

1. Type and Grade: S (single component) and NS (nonsag).
2. Class: 25.

3. Use Related to Exposure: NT (nontraffic) and T (traffic) for use intended.

B. PROVIDE SILICONE CAULK AT INTERIOR JOINTS:

1. Tub apron to flooring.
2. Sides and top of acrylic tub and shower surround to wall.
3. Tub spout to tile or acrylic surround.
4. Shower head wall escutcheon to wall.

C. PROVIDE PAINTABLE SILICONIZED ACRYLIC LATEX CAULK AT INTERIOR JOINTS:

1. Window frame to drywall return and window sill.
2. Wood door trim to drywall and to metal door frame.
3. Wood base to wall and flooring.
4. Vanity back splash to drywall.
5. Kitchen countertop, backsplash, to wall.
6. Sides and bottom of wall cabinets to wall.
7. Perimeter of medicine cabinet to drywall.

D. PROVIDE URETHANE CAULK AT EXTERIOR JOINTS:

1. Window and door frame perimeter.
2. Wood or composite trim to metal door frame.
3. Setting bead for door sills.
4. Expansion and control joints in masonry.

E. All wall, ceiling and floor penetrations in mechanical closets such as line sets, duct-work and piping shall be sealed, regardless of whether required to maintain fire ratings.

F. Provide caulking per requirements associated with energy, thermal and environmental performance requirements, such as sealing of slab penetrations, sealing of exterior wall penetrations for air infiltration protection and sealing of exterior wall, floor and joint penetrations to prevent pest entry. Comply with minimum Energy Star requirements for maintaining thermal envelope, including:

1. Pipe, duct, cable and conduit penetrations.
2. Gaps between conditioned and unconditioned spaces.
3 Perimeter of exhaust fans at top floor ceilings.
4. Recessed light fixtures in unconditioned spaces.

END OF SECTION

SECTION 081200 – RESIDENTIAL STEEL ENTRANCE DOOR AND FRAME UNITS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Steel entrance door units.
   a. Insulated
   b. Metal jambs

1.3 SUBMITTALS

A. Product data: including details of construction, materials, dimensions, hardware preparation, core, label compliance, profiles and finishes.

B. Shop drawings: showing fabrication and installation of insulated steel entry doors and frames. Include details of each frame type, elevations of door design types, conditions at openings, details of construction, location and installation requirements of door and frame hardware and reinforcements, and details of joints and connections. Show anchorage and accessory items.

1.4 QUALITY ASSURANCE

A. Provide doors and frames complying with Steel Door Institute "Recommended Specifications Standard Steel Doors and Frames" ANSI/SDI-100 and as herein specified.

B. Burning Characteristics of Insulated Core: ASTM E84-75 for 75 flame spread and 450 smoke rating respectively.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver doors and frames cardboard-wrapped or crated to provide protection during transit and job storage.

B. Inspect door and frame assemblies upon delivery for damage. Minor damages may be repaired provided refinished items are equal in all respects to new work

and acceptable to Architect; otherwise, remove and replace damaged items as directed.

C. Store door and frame assemblies at building site under cover. Place units on minimum 4-inches high wood blocking. Avoid use of non-vented plastic or canvas shelters which could create humidity chamber. If cardboard wrapper on door becomes wet, remove carton immediately. Provide 1/4-inches spaces between stacked doors to promote air circulation.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work, include the following:

1. Steelcraft
2. Timely Industries

2.2 MATERIALS

A. Door Panel: Bottom rail may be machined to accept weather seal. Mounting surface for latching hardware to be reinforced with solid internal blocking.

1. Metal-edge steel doors: shall be fabricated featuring: 25-gauge galvanized steel facings, 25-gauge galvanized steel stiles, galvanized steel top and bottom rails. Door facings are to be bonded to stiles and rails with secure mechanical interlocking design. Insulated core to be poured-in-place polyurethane foam forming a structural attachment to all door compounds.

B. Door Frame:

1. Door Frame: Timely AK-Series, basis of design.

C. Threshold: Shall be Provided as part of door assembly. Provide ADA compliant low profile threshold at ALL doors. Provide threshold to cover joint at slab edge and patio/ stoop.

D. Shop Applied Paint:

Primer: Rust-inhibitive enamel or paint, baking, suitable as a base for specified finish paints complying with ANSI A224.1, "Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames."

Finish: Refer to Division 9 "Painting" for field painting of doors.

E. Air Infiltration rate shall be less than or equal to 0.5 cfm/ft2.

2.3 FABRICATION

A. Fabricate steel door and frame assemblies to be rigid, neat in appearance and free from defects, warp or buckle. Wherever practicable, fit and assemble units in manufacturer's plant. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.

B. Steel Entry Door Preparation: Doors to receive mortised and concealed finish hardware, including cut-outs, reinforcing, drilling and tapping, complying with ANSI A115 "Specifications for Door and Frame Preparation for Hardware". Provide hinge preparation as required for (3) hinges. Hinges may be provided by door manufacturer, and shall match finish of other hardware, specified in Division 8 Hardware.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Install door and frame assemblies and accessories in accordance with final shop drawings, manufacturer's data, and as herein specified.

3.2 ADJUST AND CLEAN

A. Prime Coat Touch-up: Immediately after erection, sand smooth any rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer. Prep per manufacturer’s recommendations for field painting.

B. Final Adjustments: Check and readjust operating hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION

SECTION 082111 - HOLLOW CORE WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Hollow-core doors with hardboard faces for field painting.
2. Prehung door and frame assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of door. Include details of core and edge construction, trim for openings, and louvers.

B. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain doors through one source from a single manufacturer.

B. Quality Standard: Comply with the following standard:

1. NWWDA Quality Standard: NWWDA I.S.1-A, "Architectural Wood Flush Doors."
2. AWI Quality Standard: AWI's "Architectural Woodwork Quality Standards" for grade of door, core, construction, finish, and other requirements.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Protect doors during transit, storage, and handling to prevent damage, soiling, and deterioration. Comply with requirements of referenced standard and manufacturer's written instructions.

B. Mark each door with individual opening numbers used on Shop Drawings. Use removable tags or concealed markings.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet-work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

B. Environmental Limitations: Do not deliver or install doors until conditions for temperature and relative humidity have been stabilized and will be maintained in storage and installation areas during the remainder of the construction period to comply with requirements of the referenced quality standard for Project's geographical location.

1.7 WARRANTY

A. General Warranty: Door manufacturer's warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.

B. Door Manufacturer's Warranty: Submit written agreement on door manufacturer's standard form, signed by manufacturer, Installer, and Contractor, agreeing to repair or replace defective doors that have warped (bow, cup, or twist) more than 1/4 inch (6.35 mm) in a 42-by-84-inch (1067-by-2134-mm) section or that show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch (0.25 mm in a 75-mm) span, or do not comply with tolerances in referenced quality standard.

1. Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
2. Warranty shall be in effect during the following period of time after the date of Substantial Completion:

a. Hollow-Core Interior Doors: One year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

a. Basis of Design: Masonite, Molded Panel Doors.

2.2 DOOR CONSTRUCTION, GENERAL

A. Faces: Hardboard, smooth face.

B. Design: 2 - panel.

2.3 HOLLOW-CORE DOORS

A. Interior Hardboard-Faced Doors: Comply with the following requirements:

1. Core: Standard hollow core-corrugated honeycomb.
2. Construction: Hardboard faces glued directly to core.
3. Blocking: Provide manufacturer’s standard wood blocking.

B. Casing: Refer to Division 062023 – Interior Finish Carpentry.

C. Hinges: Manufacturer’s hardware shall match finish of all other hardware specified and overall hardware specification.

D. Jamb: Manufacturer’s standard jamb, finger jointed. Contractor has the option to provide a split-jamb.

2.4 FABRICATION

A. Factory fit doors to suit frame-opening sizes indicated.

B. Provide 1” clearance at bottom of all doors.

2.5 FACTORY FINISHING

A. General: Factory prime doors for field finishing.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine doors and frames before installation.

1. Verify that doors and frames comply with indicated requirements for type, size, location, and swing characteristics.
2. Reject doors and frames with defects.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Hardware: For installation, see Division 8 Section "Door Hardware."

B. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

C. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

3.3 ADJUSTING AND PROTECTING

A. Operation: Rehang or replace doors that do not swing or operate freely.

B. Finished Doors: Refinish or replace doors damaged during installation.

C. Protect doors as recommended by door manufacturer to ensure that doors and frames are without damage or deterioration at the time of Completion.

END OF SECTION

SECTION 085200 - VINYL WINDOWS

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 vinyl window units. Window types required include:

1. Single-hung vinyl insulating glass windows.

1.3 DEFINITIONS

A. Performance class number included as part of the window designation system is the actual design pressure in pounds per sq. ft. used to determine the structural test pressure and water test pressure.

1. Structural test pressure, windload test, is equivalent to 150 percent of the design pressure.
2. Water leakage resistance test pressure is equivalent to 15 percent of the design pressure with 2.86 psf as a minimum.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

A. General: Provide window units that comply with performance requirements specified, as demonstrated by testing manufacturer's corresponding stock systems according to test methods indicated.

B. Design Requirements: Comply with structural performance, air infiltration, and water penetration requirements indicated in AAMA 101 for type, grade, and performance class of window units required.

1. Design wind velocity at the project site is 90 mph.

C. Testing: Test each type and size of required window unit through a recognized independent testing laboratory or agency, in accordance with ASTM E 330 for structural performance, with ASTM E 283 for air infiltration, and with both ASTM E 331 and ASTM E 547 for water penetration. Provide certified test results.

D. Energy Performance Ratings:

1. U-Factor (U.S./I-P): .30 max.
2. SHGC: .40 max
2. Design Pressure: DP 35

E. Energy Star: All windows shall be “Energy Star” certified.

1.5 SUBMITTALS

A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification Sections.

1. Product data for each type of window required, including:

   a. Construction details and fabrication methods.
   b. Profiles and dimensions of individual components.
   c. Data on hardware, accessories, and finishes.
   d. Recommendations for maintenance and cleaning of exterior surfaces and repair.
   e. Certification that window meets the size requirements for emergency escape and rescue per the Building Code.

2. Shop drawings for each type of window required. Include information not fully detailed in manufacturer's standard product data and the following: For emergency escape and rescue per applicable code.

   a. Layout and installation details, including anchors.
   b. Elevations of continuous work at 1/4-inch scale and typical window unit elevations at 3/4-inch scale.
   c. Full-size section details of typical composite members, including reinforcement.
   d. Hardware including operators.
   e. Glazing details.
   f. Accessories.
   g. Provide dimensions of window openings/sizes indicating that windows comply with the size requirements for emergency escape and rescue per the Building Code.

3. Certification: Provide certification by a recognized independent testing laboratory or agency showing that each type, grade, and size of window unit complies with performance requirements indicated.

4. Material Test Reports: Engage a recognized independent testing laboratory or agency to perform tests specified. Provide certified test results showing that each type, grade, and size of window unit complies with performance requirements indicated.

5. Color samples for selection: Provide white and tan for selection.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced Installer who has completed installation of windows similar in design and extent to those required for the project and whose work has resulted in construction with a record of successful in-service performance.

B. Single-Source Responsibility: Provide window units from one source and produced by a single manufacturer.

1.7 PROJECT CONDITIONS

A. Check actual window rough openings by accurate field measurement before installation. Coordinate with other components of work to be installed.

1.8 WARRANTY

A. Vinyl Window Warranty: Submit a written warranty, executed by the window manufacturer, agreeing to repair or replace window units that fail in materials or workmanship within the specified warranty period. Failures include but are not necessarily limited to:

2. Structural failures including excessive deflection, excessive leakage, or air infiltration.
3. Faulty operation of sash and hardware.
4. Deterioration of finishes, and other materials beyond normal weathering.

B. Warranty Period: 10 years after the date of Final Completion, which shall be Owner's acceptance of each building.

C. The warranty shall not deprive the Owner of other rights or remedies that the Owner may have under other provisions of the Contract Documents and is in addition to and runs concurrent with other warranties made by the Contractor under requirements of the Contract Documents.

1. Date of purchase shall not be considered at start date of warranty.
2. Manufacturer and supplier shall include all costs to provide full warranty beginning at date of acceptance.

1.9 EXTRA MATERIALS

A. Furnish extra materials as listed in Specification Section "Closeout Procedures" that match and are from same production runs as products installed and that are packaged with protective covering and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work are acceptable.

2.2 MATERIALS

A. Extrusions: Provide solid vinyl PVC material multi-hollow tubular sections recommended by the window manufacturer for the strength, corrosion resistance, and application of required finish and use, and not less than 0.070 inch thick at any

location for main frame and sash members.

B. Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials warranted by the manufacturer to be noncorrosive and compatible with window members, trim, hardware, anchors, and other components of window units.

1. Reinforcement: Where fasteners screw-anchor into material less than 0.125 inch thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads or provide standard noncorrosive pressed-in splined grommet nuts.

2. Exposed Fasteners: Except where unavoidable for application of hardware, do not use exposed fasteners. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.

C. Anchors, Clips, and Window Accessories: Fabricate anchors, clips, and window accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel; provide sufficient strength to withstand design pressure indicated.

D. Weatherstripping: Provide stripping with double fin seal of semirigid plastic sheet of polypropylene. Provide bulb-type weatherstripping at bottom rail of sash at sill.

F. Glazing: Provide 5/8” - 3/4" Low-E-Argon insulating glass units. Preglaze window units at the factory where possible and practical for applications indicated.

G. Provide sash units **with** “tilt-in” feature.

H. Window Screen: Half screen.

2.3 HARDWARE

A. General: Provide the manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with and of sufficient strength to perform the function for which it is intended.

2.4 WINDOWS

A. Window Grade and Class: Provide window units that comply with requirements of AAMA Grade and Performance Class DH-R35, including operating force and deglazing test requirements specified in AAMA 101.

B. Hardware: Provide the following equipment and operating hardware:

1. Sash Balances: Manufacturer's standard type.
2. Pull-Down Handles: Manufacturer’s standard.
3. Lock-cam action sweep lock and keeper on the meeting rail.

2.5 FABRICATION

A. General: Fabricate window units to comply with indicated standards. Include a complete system for assembly of components and anchorage of window units.

1. Provide units that are reglazable without dismantling sash or ventilator framing.

PART 3 - EXECUTION

3.1 INSPECTION

A. Inspect openings before beginning installation. Verify that rough opening is correct and the sill plate is level.

1. Wood frame walls shall be dry, clean, sound, and well-nailed, free of voids and without offsets at joints. Ensure that nail heads are driven flush with surfaces in the opening and within 3 inches of the opening.

3.2 INSTALLATION

A. Comply with manufacturer's specifications and recommendations for installation of window units, hardware, operators, and other components of the work.

B. Set window units plumb, level, and true to line, without warp or rack of frames or sash. Provide proper support and anchor securely in place.

C. Set sill members and other members in a bed of compound or with joint fillers to provide weathertight construction. Refer to the "Joint Sealer" section of Division 7 for sealers to be installed with window units. Coordinate installation with wall flashings and other components of the work.

3.3 ADJUSTING

A. Adjust operating sash and hardware to provide a tight fit at contact points and at weatherstripping for smooth operation and a weathertight closure.

3.4 CLEANING

A. Clean vinyl surfaces promptly after installation of windows. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt, and other substances. Lubricate hardware and other moving parts.

B. Clean glass of preglazed units promptly after installation of windows.

3.5 PROTECTION

A. Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of Final Completion.

END OF SECTION

SECTION 087100 - FINISH HARDWARE

SUMMARY

Section includes furnishing and installation of all hardware to the respective trades. The hardware supplier will promptly furnish templates to all other manufacturers furnishing materials necessary to completion of this part.

SUBMITTALS

HARDWARE SCHEDULE:

Certain additional items of hardware and/or hardware accessories specified herein shall be furnished and installed, although they may not appear in Hardware Schedule.

SUPPLIER'S HARDWARE SCHEDULE:

A complete Hardware Schedule, indicating type, number, location and finish shall be submitted to Architect for approval, together with such samples as may be required for review. Opening numbers shall be same as used in Contract Documents. Schedule shall be prepared according to DHI sequence and format for submittals and shall include degree of door closer installation.

Supplier's hardware schedule will be reviewed by Architect for type, quality and finish and for function (other than hand). Contractor shall be responsible for checking schedule for correct hand of locksets and for supplying quantity of items required by Contract Documents.

Provide supplementary or revised hardware schedules if deemed necessary by Architect.

Do not ship or deliver hardware to job prior to review and approval of hardware schedules by Architect.

Upon completion, the Contractor shall deliver to the Architect, for the Owner's maintenance personnel, two copies of all installation instructions, templates, wrenches, installation tools, etc., supplied by the various manufacturers packed with the hardware necessary for installation and maintenance.

WARRANTY

Warranty to commence at date of acceptance.

Furnish manufacturers' limited warranty covering defects in materials and workmanship for periods indicated as follows:

Grade 1 Locksets: Minimum Ten years
Grade 2 Locksets: Minimum Five years
All other hardware: Minimum One year

EXTRA MATERIALS:

Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

Provide 20% of apartment entry door hardware of amount installed, for each type, composition, pattern indicated.

QUALITY ASSURANCE

Hardware Consultant: As a mandatory requirement all hardware shall be furnished by an established builders hardware firm which maintains and operates an office, display and stock in this area, and which is a regular authorized distributor of the lock he proposes to furnish. All schedules submitted to the Architect for approval and job use shall carry the signature of this Certified Architectural Hardware Consultant by DHI.

It shall be the responsibility of the hardware supplier to provide the proper hardware for door function and to meet the proper codes. All discrepancies shall be brought to the attention of the Architect a minimum of ten days prior to bid date so an addendum may be issued. No additional compensation will be allowed after bidding for hardware changes required to meet the proper door function or to meet the proper codes.

These specifications are a guide and describe the quality of materials required. No material of quality or weight less than that outlined in this specification will be accepted. The Contractor will be responsible for supplying the correct quantity of all materials whether or not specifically mentioned in this specification. Any additional items that may be required shall be furnished and be of type, quality and utility consistent with other hardware specified.

No consideration will be granted for any alleged misunderstanding of the material to be furnished or work to be done, it being duly understood that the tender of a proposal carries with it the agreement to all items and conditions referred to herein or indicated on plans, whether specifically mentioned herein or not.

The hardware items in the hardware sets describe a general quality of material. This contractor shall be responsible for supplying hardware compatible in keying, function and finish with existing hardware.

DELIVERY, STORAGE AND HANDLING

The General Contractor shall provide storage facilities for the finish hardware after delivery to the jobsite. A separate room under lock and key, with shelves and bins as necessary to provide dry storage for all hardware items will be required.

Hardware Supplier shall receive and check all hardware at his warehouse. All hardware shall be delivered to the job by the Hardware Supplier in one shipment. Drop shipments to the jobsite from the various hardware manufacturers will positively not be permitted. All hardware shall be properly wrapped in separate packages complete with trimmings, screws and related items, each plainly labeled and numbered to agree with the door numbers and Contractor's typewritten

schedule.

The Contractor shall submit his schedules for corrections and approval to the Architect before proceeding with any work. The Hardware Supplier shall repack all separate boxes and packages of hardware, in cartons or cases, and attach to the outside of each case or carton, a label indicating the manufacturer of the material, contents, quantity, item number on Hardware Schedule and door number, before delivery to jobsite. Hardware, when required, shall be delivered to the shops of the various door manufacturers, properly marked and labeled following the same procedure outlined above for jobsite shipment.

PART 2 - PRODUCTS

MATERIALS

Door Stop:

Provide door stops wherever necessary to prevent door or hardware from striking an adjacent partition or obstruction. Provide wall type whenever possible. Door stops mounted on concrete floor shall have machine screws and lead expansion shields. Provide stop at carpeted areas with 1/2” spacers.

Locksets:

Locks shall be mortise or cylindrical type as indicated. Lock bodies and lock trim shall be by same manufacturer. Backset on all knob locks and dead locks shall be 2-3/4". Dead locks shall have 1" throw bolts and be equipped with armor fronts.

Locks to be equipped with interchangeable “I/C” cores.

Hinges: Shall be provided by prehung door manufacturer. Hinges shall match finish of all other hardware.

Miscellaneous Items:

Fasteners: Furnish appropriate fasteners for proper installation. Provide matching finish where exposed.

Special Tools: Provide manufacturer's special tools, if required for maintenance or repair of hardware.

Maintenance Data: Provide manufacturer's data for items that require special instructions for repair or maintenance.

FINISHES

Hardware finish shall be polished brass.

KEYING

Locks and cylinders shall be keyed as directed by the Owner. It is the responsibility of the

Hardware Supplier, to meet with the Owner and Architect to finalize keying, to receive and maintain keying records.

Furnish six (6) master keys. Furnish three (3) change keys per lock or cylinder. Locksets and dead locks are keyed alike.

PART 3 - EXECUTION

INSPECTION

Inspect all openings, doors, walls, partitions, jambs and other conditions to insure that conditions will allow proper installation of hardware. Report in writing any conditions which must be corrected before hardware can be installed properly.

INSTALLATION

Work shall be done under the direction of a finish hardware specialist and shall be installed by the carpentry contractor using craftsman skilled and experienced in installation of finish hardware. Installation shall be in a neat workmanlike manner in accordance with the approved hardware schedule.

All items of hardware shall be secure and free working in the manner intended. Hardware shall be accurately mortised and fitted before painting. Hardware shall not be applied until the painting is finished.

Locations: Mortised items shall be installed at frame manufacturer's standard locations. Surface mounted items shall be installed at heights recommended by the DHI.

Mortised items shall be neatly set in and made flush with door or frame surface. Manufacturer's instructions and recommendations shall be strictly followed.

Fasteners: Hardware shall be installed with proper wood or machine screws supplied by manufacturer.

After hardware is installed, the General Contractor shall cover exposed surfaces of locksets and similar items with a suitable covering to protect the hardware from scratches, abrasion and tarnishing. This is to be left on until the building is completed and ready for final inspection.

END OF SECTION

SECTION 092900 - GYPSUM BOARD

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Gypsum board assemblies attached to wood framing.

1.3 DEFINITIONS

A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms for gypsum board assemblies not defined in this Section or in other referenced standards.

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 type of product specified and installation instructions to show compliance with these specifications.

C. Product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

1.5 QUALITY ASSURANCE

A. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

B. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.

B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.

1.7 PROJECT CONDITIONS

A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 requirements or gypsum board manufacturer's recommendations, whichever are more stringent.

B. Room Temperatures: For nonadhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours before application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.

C. Ventilation: Ventilate building spaces as required to dry joint treatment materials. Avoid drafts during hot, dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1 Gypsum Board and Related Products:

a. Domtar Gypsum.
b. Georgia-Pacific Corp.
c. National Gypsum Co.; Gold Bond Building Products Division.
d. United States Gypsum Co.

2.2 GYPSUM BOARD PRODUCTS

A. General: Provide gypsum board of types indicated in maximum lengths available that will minimize end-to-end butt joints in each area indicated to receive gypsum board application.

1. Widths: Provide gypsum board in widths of 48 inches (1219 mm).

B. Gypsum Wallboard: ASTM C 36 and as follows:

1. Type: Regular for vertical surfaces, unless otherwise indicated.
2. Type: Rated where required for fire-resistance-rated assemblies.
3. Edges: Tapered and featured (rounded or beveled) for prefilling.
4. Thickness: As indicated.

C. Water and Mold-Resistant Gypsum Wallboard: ASTM C 630 and as follows:

1. Type: Regular, unless otherwise indicated
2. Type: Rated where required for fire-resistance-rated assemblies and where indicated.
3. Thickness: As indicated.
4. Provide water and mold-resistant gypsum board where indicated.
5. Do not install on ceilings.

2.3 TRIM ACCESSORIES

A. Accessories for Interior Installation: Cornerbead, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:

1. Material: Formed metal complying with the following requirement:

a. Steel sheet zinc coated by hot-dip process or rolled zinc.
b. Steel sheet zinc coated by hot-dip or electrolytic process, or steel sheet coated with aluminum or rolled zinc.

2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:

a. Cornerbead on outside corners, unless otherwise indicated.
b. J-bead with both face and back flanges; face flange formed to receive joint compound. Use J-beads for edge trim, unless otherwise indicated.
c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.

1. Where gypsum board abuts window frames, tub surrounds, communication/ media boxes, and other similar components, with no trim or mud flange, provide vinyl tear-away trim equal to Trim-Tex #9000 L-trim.

d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.

2.4 JOINT TREATMENT MATERIALS

A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.

B. Joint Tape for Gypsum Board: Paper reinforcing tape, unless otherwise indicated.

C. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.

1. Ready-Mixed Formulation: Factory-mixed product.
   a. All-purpose compound formulated for both taping and topping compounds.

2.5 MISCELLANEOUS MATERIALS

A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.

B. Laminating Adhesive: Special adhesive or joint compound recommended for laminating gypsum panels.

C. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot-grouting hollow metal door frames.

D. Fastening Adhesive for Wood: ASTM C 557.

E. Steel drill screws complying with ASTM C 1002 unless otherwise indicated.

1. Use screws complying with ASTM C954 for fastening panels to steel members from 0.033 to 0.112 inch (0.84 to 2.84 mm) thick.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates to which gypsum board assemblies attach or abut, to with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

A. Gypsum Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.

B. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch (1.5 mm) of open space between panels. Do not force into place.

C. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Avoid joints other than control joints at corners of framed openings where possible.

D. Attach gypsum panels to framing provided at openings and cutouts.

E. Install ceiling panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.

F. Cover both faces of support framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chases braced internally.

1. Unless concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. (0.7 sq. m) in area.
2. Fit gypsum panels around ducts, pipes, and conduits.
3. Where partitions intersect structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by structural members; allow 1/4- to 3/8-inch- (6.4- to 9.5-mm-) wide joints to install sealant.

G. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations, but not less than the following:

1. Space fasteners a maximum of 12 inches (304.8 mm) o.c. for vertical applications, and for horizontal applications.

H. Install gypsum panels with floating internal corner construction. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joist and headers. Float gypsum panels over these members, or provide control joints to counteract wood shrinkage.

3.3 GYPSUM BOARD APPLICATION METHODS

A. Single-Layer Application: Install gypsum wallboard panels as follows:

1. On partitions/walls, apply gypsum panels horizontally (perpendicular to framing), unless parallel application is required for fire-resistance-rated assemblies. Use maximum-length panels to minimize end joints. Non-load bearing walls do not fasten within 6” of ceiling wall intersection at ceiling or wall.

a. Stagger abutting end joints not less than one framing member in alternate courses of board.

B. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:

1. Fasten with screws or nails, staples not permitted.
2. Do not fasten gypsum board to non-load bearing partitions within 6” of ceiling wall intersection at either ceiling or wall.

C. Direct-Bonding to Substrate: Where gypsum panels are indicated as directly adhered to a substrate comply with gypsum board manufacturer's recommendations, and temporarily brace or fasten gypsum panels until fastening adhesive has set.

D. On ceilings, apply gypsum panels before wall/partition board application to greatest extent possible and at right angles to framing, unless otherwise indicated.

3.4 INSTALLING TRIM ACCESSORIES

A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.

B. Install cornerbead at external corners. Provide 2-layers of paper joint tape.

C. Install edge trim where edge of gypsum panels would otherwise be exposed. Provide edge trim type with face flange formed to receive joint compound, except where other types are indicated.

1. Install J-bead where gypsum panels are tightly abutted to other construction.

2. Install L-bead where edge trim can only be installed after gypsum panels are installed.
3. Install U-bead where required.
4. Install “L” trim where gypsum board abutts dissimilar materials.

3.5 FINISHING GYPSUM BOARD ASSEMBLIES

A. General: Treat gypsum board joints, interior angles, flanges of cornerbead, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration.

B. Prefill open joints, rounded or beveled edges, and damaged areas.

C. Apply joint tape over gypsum board joints, except those with trim accessories having flanges not requiring tape.

D. Use the following joint compound combination as applicable to the finish levels specified:

1. Embedding and First Coat: Ready-mixed, drying-type, all-purpose or taping compound. Fill (Second) Coat: Ready-mixed, drying-type, all-purpose or topping compound. Finish (Third) Coat: Ready-mixed, drying-type, all-purpose or topping compound.

2. Provide a level 4 finish on all walls and ceilings.

3.6 CLEANING AND PROTECTION

A. Promptly remove any residual joint compound from adjacent surfaces.

B. Provide final protection and maintain conditions, in a manner acceptable to Installer, that ensure gypsum board assemblies are without damage or deterioration at the time of Final Completion.

END OF SECTION

SECTION 093970 - SYNTHETIC MARBLE

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:

1. Vanity Tops.

1.3 SUBMITTALS

A. General: Submit the following according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product Data: As follows:

1. Submit data for each item.

C. Maintenance data to include in the Maintenance Manual specified in Division 1 Section "Project Closeout."

D. Samples for selection: Submit full range of colors available. Selections by the Architect. Selections may vary from unit to unit.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Firm experienced in supplying products similar to those indicated for this Project with a record of successful in-service performance.

B. Installer Qualifications: Engage an experienced Installer who has completed installations that are similar in the material, design, and extent indicated for this Project and that have performed successfully.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with fabricator's instructions and recommendations for delivery, storage, and handling requirements.

B. Deliver materials to Project site in an undamaged condition.

C. Store and handle materials to prevent deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breakage, chipping, or cracking.

PART 2 - PRODUCTS

2.1MATERIALS - GENERAL

A. Products: Shall be manufactured from cast polymer resin with calcium carbonate filler, of a gel-coated, non-laminated composite product, with a minimum of 20 mils of gel-coat. Product shall be certified to meet ANSI 123 standards. Products shall comply with requirements listed below.

2.2 SYNTHETIC MARBLE PRODUCTS

A. Window Stools:

1. Nominal Facial Dimensions: Max. size for use intended.
2. Thickness: 3/4 inch, nominal.

a. Shapes and Sizes: As shown in details and full width of opening.

B. Vanity Tops:

1. Provide tops in sizes to fit vanity base cabinets as shown in drawings.
2. Thickness: 3/4 inch, nominal.
3. Provide tops with integral bowl, backsplash and front overflow. Bowl shall be "oval".
4. Provide holes for faucet set. Coordinate with plumbing specifications.
5. Sidesplash(s) are required.

C. Tub Surrounds: (three piece)

1. Panel Dimensions: Provide panels, full height too ceiling. Provide panels full length/ width of tub end wall/ side wall.

a. Splicing of panels and use of a batten is not allowed.

2. Thickness: ¼ inch, nominal.
3. Provide Manufacturer’s standard integral molded-in soap dish.

D. Manufacturers: Products complying with requirements of the contract documents, and this specification, will be among those considered acceptable:

E. Finish: Shall be as selected by Owner from manufacturer’s standard color selections for all products.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine surfaces to receive materials. Review with the Installer present for compliance with requirements for tolerances and conditions affecting installation performance. Report in writing conditions not complying with requirements. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION - GENERAL

A. Install products, with manufacturer's adhesives and per manufacturer's recommended installation methods.

3.3 PREPARATION

A. Advise Installers of adjoining and related work about specific requirements for placement of their work and similar items that will be used by Installer for anchoring, supporting, and setting synthetic marble items. Furnish Installers of related work with drawings or templates showing locations of these items.

3.4 ADJUSTING, CLEANING, AND SEALING

A. Remove synthetic marble with the following defects:

1. Broken, chipped, stained, or otherwise damaged items.
2. Not matching approved samples.
3. Not complying with requirements indicated.

B. Clean synthetic marble after installation and setting time is complete. Use procedures recommended by manufacturer for types of application.

3.5 PROTECTION

A. Protect surfaces, edges, and corners from construction damage.

END OF SECTION

SECTION 096520 – FLOATING LOCKING FLOOR SYSTEM

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. Vinyl wood plank.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Shop Drawings: For each type of floor product. Include floor tile layouts, edges, columns, doorways, enclosing partitions, built-in furniture, cabinets, and cutouts.

1. Show details of special patterns.

C. Samples for Initial Selection: For each type of floor product indicated.

D. Qualification Data: For qualified Installer.

E. Maintenance Data: For each type of floor product to include in maintenance manuals.

G. Provide certification by the manufacturer that products supplied are “FloorScore” certified.

1.4 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor installation indicated.

1. Engage an installer who employs workers for this Project who are trained or certified by manufacturer for installation techniques required.

B. Fire-Test-Response Characteristics: 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 0.60 W/sq. cm.

C. At concrete floor slabs, General Contractor to protect concrete floor slabs from moisture including ponding water, to the full extent possible. All ponding water to be

removed from concrete floor slab(s) as soon as possible, do not allow ponding water to stand or to evaporate. Contractors are advised ponding water on concrete floor slabs will increase the concrete floor slab drying time and humidity levels and increase the time required for environmental conditioning for the finishes.

D. At concrete floor slabs, floor finish contractor to advise the General Contractor in writing, the time frame required by the floor finish manufacturers for controlled environmental conditions, air temperature and humidity levels, prior to floor testing and installation.

1. Floor finish contractor to develop and maintain logs of environmental conditions, temperature and humidity levels, within the building prior to testing and floor finish installations and shall advise the general contractor in writing if environmental conditions are not adequate or are not maintained as required for floor finishes following installation. Logs are to be submitted with floor finish warranty and closeout documents

2. Construction schedules shall be developed to include time requirements for environmental conditioning of spaces and concrete testing at areas scheduled to receive adhered floor finish materials. Project specific testing time must be coordinated and confirmed with concrete moisture testing agency during initial construction coordination and scheduling meetings.

3. During installation, contractor shall document and log daily environmental conditions within areas (rooms) being worked in. Logs to include temperature and humidity levels present at time of installation. Logs are to be submitted with floor finish warranty and close out documents

E. Remove all adhesives, oils, residue, and any concrete surface contaminates that will interfere with new finishes, include light floor sanding at all slabs scheduled to receive new finishes.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Store floor product and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer. Store floor product material as recommended by manufacturer.

1.6 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:

1. 48 hours before installation.
2. During installation.
3. 48 hours after installation.

1.7 WARRANY

A. Provide manufacturer's standard (12)-year warranty against defects in manufacturing and workmanship of flooring products.

1.8 WARRANTIES

A. Special adhered flooring installation Warranty: Flooring contractor to provide special 2 year floor finish installation warranty beginning on the date of substantial completion, warranting the floor finish installations from adhesive failure, full or partial, resulting from conditions present at the time of installation.

PART 2 - PRODUCTS

2.1 SOLID VINYL WOOD PLANK FLOORING: As indicated on drawings.

A. Available Products: Subject to compliance with requirements, products that may be included in the Work, include, but are not limited to the following:

1. Manufacturers meeting the requirements of these specifications will be acceptable.

B. Product Standard Classification: ASTM F 1700-04, Class 111, Type B.

C. Plank Size: Manufacturer shall offer plank sizes in varying widths for selection.

1. Plank length: Shall be 36” minimum
2. Floor product shall be waterproof.

D. Gauge: 8 mm, minimum.

E. Wear Layer: 20 mil, Ceramic Bead Finish.

F. Smoke Density: Class 1 <450 per ASTM E 662.

G. Color and Pattern:

1. Select from Manufacturer’s Full Range of products.

2.2 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit floor product and substrate conditions indicated as applicable.

1. Use adhesives that comply with the following limits for VOC content when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

    a. Specialty Adhesives for vinyl wood plank as required by Manufacturer.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. 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 floor tile.

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents. Remove all adhesives, mastic, glue, residue, etc,
3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing.

    a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
    b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor products until they are same temperature as space where they are to be installed.

1. Move floor products and installation materials into spaces where they will be installed in advance of installation, per manufacturer’s printed installation instructions.

E. Sweep and vacuum clean substrates to be covered by floor products immediately before installation.

F. Prepare a mock-up of flooring material to review alignment with corridor walls.

3.3 INSTALLATION

A. Comply with manufacturer's written instructions for installing product.

B. Lay out flooring from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half plank at perimeter.

1. Lay planks square with room or in pattern indicated on drawings.

C. Match floor planks for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed products.

1. Lay planks with grain running in one direction in pattern of colors and sizes indicated.

D. Scribe, cut, and fit flooring to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, and doorframe

E. Extend flooring into toe spaces, door reveals, closets, under cabinets and similar openings.

1. Extend flooring to center of door openings where a different floor finish material is provided. Coordinate work with other flooring installers.

F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on flooring as marked on substrates. Use chalk or other nonpermanent, nonstaining marking device.

3.4 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of flooring.

B. Perform the following operations immediately after completing flooring installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect flooring products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction

END OF SECTION

SECTION 099100 - PAINTING

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 surface preparation, painting, and finishing of exposed interior and exterior items and surfaces.

1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop-priming and surface treatment specified under other Sections.

B. Paint exposed items and surfaces whether or not finish or colors are designated, except where a surface or material is specifically indicated not to be painted or is to remain natural.

1. Where an item or surface is not specifically mentioned, paint the same as similar adjacent materials or surfaces. If color or finish is not designated, the contractor shall request Architect make a selection from standard colors or finishes available, at no additional cost to the contract.

C. Painting is not required on prefinished items, finished metal surfaces, concealed surfaces, operating parts, and labels.

1. Labels: Do not paint over Underwriters Laboratories, Factory Mutual or other code-required labels or equipment name, identification, performance rating, or nomenclature plates.

2. Painting of mechanical and electrical work not factory finished is included in this specification section for items exposed in occupied spaces and at the building exterior. And shall include, but not limited to the following.

A. Exposed piping. (interior and exterior)
B. Clean-out covers. (interior)
C. Exposed hangars and supports.
D. Exposed conduit.
E. Metal hoods on vents.

1.3 SUBMITTALS

A. General: Submit the following according to Conditions of the Contract and Division 1 Specification Sections.
B. Product data for each paint system specified and primers.

1. Provide the manufacturer's technical information including label analysis and

instructions for handling, storage, and application of each material proposed for use.

2. List each material and cross-reference the specific coating, finish system, and application. Identify each material by the manufacturer's catalog number and general classification.
3. Certification by the manufacturer that products supplied contain NO volatile organic compounds (VOCs).

C. Samples for color selection in the form of manufacturer's color charts.

1. After color selection, the Architect will furnish color chips for surfaces to be coated. Some color selections have been inserted in this specification for design intent purposes. Submit manufacturer’s color charts.

1.4 QUALITY ASSURANCE

A. Applicator Qualifications: Engage an experienced applicator that has completed painting system applications similar in material and extent to those indicated for the Project that have resulted in a construction record of successful in-service performance.

1 Application of the Epoxy Floor Coating product shall be by a certified qualified applicant approved by the manufacturer for the system provided. The installer must have completed at least two successful similar projects.

B. Single-Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.

C. Field Samples: On wall surfaces and other exterior and interior components, duplicate finishes of prepared samples. Provide full-coat finish samples on at least 100 sq. ft. of surface until required sheen, color, and texture are obtained; simulate finished lighting conditions for review of in-place work.

1. Final acceptance of colors will be from job-applied samples.
2. The Architect will select one room as field mock-up to represent surfaces and conditions for each type of coating and substrate to be painted. Apply coatings in this room or surface according to the schedule or as specified to be used as standard of quality for remainder of project.

a. After finishes are accepted, this room or surface will be used to evaluate coating systems of a similar nature.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials to the job site in the manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:

1. Product name or title of material.
2. Product description (generic classification or binder type).
3. Manufacturer's stock number and date of manufacture.

4. Contents by volume, for pigment and vehicle constituents.
5. Thinning instructions.
6. Application instructions.
7. Color name and number.

B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F (7 deg C). Maintain containers used in storage in a clean condition, free of foreign materials and residue.

1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.6 JOB CONDITIONS

A. Apply water-based paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 50 deg F (10 deg C) and 90 deg F (32 deg C).

B. Apply solvent-thinned paints only when the temperature of surfaces to be painted and surrounding air temperatures are between 45 deg F (7 deg C) and 95 deg F (35 deg C).

C. Do not apply paint in snow, rain, fog, or mist; or when the relative humidity exceeds 85 percent; or at temperatures less than 5 deg F (3 deg C) above the dew point; or to damp or wet surfaces.

1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by the manufacturer during application and drying periods.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Sherwin Williams or equal.

2.2 PAINT MATERIALS, GENERAL

A. Material Compatibility: Provide primers, finish coat materials, and related materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by the manufacturer based on testing and field experience.

B. Material Quality: Provide the manufacturer's best-quality trade sale paint material of the various coating types specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.

1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish the manufacturer's material data and certificates of performance for proposed substitutions.

C. Colors: Provide color selections made by the Architect from the manufacturer's full range of standard colors.

1. Color selections will vary from Unit to Unit.

D. Provide No VOC paint product, with product documentation stating volatile organic compounds, less exempt solvents at or below 50 g/L for non-flat and 50 g/L for flat,100 g/L for floor, as identified by the Green Seal Standard GS-11.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates and conditions under which painting will be performed for compliance with paint application requirements. Surfaces receiving paint must be thoroughly dry before paint is applied.

1. Do not begin to apply paint until unsatisfactory conditions have been corrected.
2. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.

1. Notify the Architect about anticipated problems using the materials specified over substrates primed by others.

3.2 PREPARATION

A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted, or provide surface-applied protection prior to surface preparation and painting. Remove these items, if necessary, to completely paint the items and adjacent surfaces. Following completion of painting operations in each space or area, have items reinstalled by workers skilled in the trades involved.

B. Cleaning: Before applying paint or other surface treatments, clean the substrates of substances that could impair the bond of the various coatings. Remove oil and grease prior to cleaning. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.

C. Surface Preparation: Clean and prepare surfaces to be painted according to the manufacturer's instructions for each particular substrate condition and as specified.

1. Provide barrier coats over incompatible primers or remove and reprime. Notify Architect in writing about anticipated problems using the specified finish-coat material with substrates primed by others.
2. Ferrous Metals: Clean ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council (SSPC).

    a. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
    b. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by the paint manufacturer, and touch up with the same primer as the shop coat.

3. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum-based solvents so that the surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.

D. Materials Preparation: Carefully mix and prepare paint materials according to manufacturer's directions.

1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
2. Stir material before application to produce a mixture of uniform density; stir as required during application. Do not stir surface film into material. Remove film and, if necessary, strain material before using.
3. Use only thinners approved by the paint manufacturer and only within recommended limits.

E. Tinting: Tint each undercoat a lighter shade to facilitate identification of each coat where multiple coats of the same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

A. General: Apply paint according to manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied.

1. Touch-up painting may require re-painting the entire wall/ surface area to produce a consistent finish. No consideration for additional compensation will be considered.

B. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.

1. Surface treatments, and finishes are indicated in the schedules.

2. Provide finish coats that are compatible with primers used.
3. The number of coats and the film thickness required are the same regardless of the application method. Do not apply succeeding coats until the previous coat has cured as recommended by the manufacturer. Sand between applications where sanding is required to produce a smooth even surface according to the manufacturer's directions.
4. Apply additional coats if undercoats, stains, or other conditions show through final coat of paint until paint film is of uniform finish, color, and appearance. Give special attention to ensure that surfaces, including edges, corners, crevices, welds, and exposed fasteners, receive a dry film thickness equivalent to that of flat surfaces.
5. The term exposed surfaces includes areas visible when permanent or built-in fixtures, convector covers, covers for finned tube radiation, grilles, and similar components are in place. Extend coatings in these areas, as required, to maintain the system integrity and provide desired protection.
6. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before the final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
7. Paint interior surfaces of ducts, where visible through registers or grilles, with a flat, nonspecular black paint.
8. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
9. Finish exterior doors on tops, bottoms, and side edges same as exterior faces.
10. Omit primer on metal surfaces that have been shop-primed and touch-up painted.

C. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.

1. Allow sufficient time between successive coats to permit proper drying. Do not recoat until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.

D. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to the manufacturer's directions.

1. Brushes: Use brushes best suited for the material applied.
2. Rollers: Use rollers of carpet, velvet back, or high-pile sheep's wool as recommended by the manufacturer for the material and texture required.
3. Spray Equipment: Use airless spray equipment with orifice size as recommended by the manufacturer for the material and texture required.

E. Minimum Coating Thickness: Apply materials no thinner than the manufacturer's recommended spreading rate. Provide the total dry film thickness of the entire system as recommended by the manufacturer.

F. Prime Coats: Before applying finish coats, apply a prime coat of material, as recommended by the manufacturer, to material that is required to be painted or finished and that has not been prime-coated by others. Recoat primed and sealed

surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.

G. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling such as laps, irregularity in texture, skid marks, or other surface imperfections.

H. Pigmented (Opaque) Finishes: Completely cover to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.

I. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with specified requirements.

3.4 FIELD QUALITY CONTROL

A. The Owner reserves the right to invoke the following test procedure at any time and as often as the Owner deems necessary during the period when paint is being applied:

1. The Owner will engage the services of an independent testing agency to sample the paint material being used. Samples of material delivered to the Project will be taken, identified, sealed, and certified in the presence of the Contractor.

2. The testing agency will perform appropriate tests for the following characteristics as required by the Owner:

    a. Quantitative materials analysis.
    b. Abrasion resistance.
    c. Apparent reflectivity.
    d. Flexibility.
    e. Washability.
    f. Absorption.
    g. Accelerated weathering.
    h. Dry opacity.
    i. Accelerated yellowness.
    j. Recoating.
    k. Skinning.
    l. Color retention.
    m. Alkali and mildew resistance.

3. If test results show material being used does not comply with specified requirements, the Contractor may be directed to stop painting, remove noncomplying paint, pay for testing, repaint surfaces coated with rejected paint, and remove rejected paint from previously painted surfaces if, upon repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

A. Cleanup: At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.

1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

3.6 PROTECTION

A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.

1. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.7 INTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Gypsum Drywall Systems:

1. Latex, Eggshell: Two coats over primer.

a. Prime Coat: Latex primer sealer.
b. Bottom and Top Coat: Latex, low-luster Enamel, 1.3 DFM.

1. Provide “semi-gloss” for kitchen, laundry, mechanical and baths.

C. Wood (Paint):

1. Latex, Semi-Gloss Enamel: Two coats over latex based primer.

a. Bottom and Top Coat: Latex, Semi-Gloss Latex Enamel, 1.5 DFM.

D. Wood (Stain):

1. Varnish, Gloss: Three coats over Stain.

a. Bottom and Top Coat: Oil Wood Stain.
b. Bottom, Intermediate and Top Coat: Polyurethane Clear Finish

3.8 EXTERIOR PAINT SCHEDULE

A. General: Provide the following paint systems for the various substrates, as indicated.

B. Ferrous Metal: Primer is not required on shop-primed items.

1. Full-Gloss Alkyd Enamel: Two finish coats over primer.

a. Primer: Synthetic rust-inhibiting primer.
b. First and Second Coats: Gloss alkyd enamel.

C. Zinc-Coated Metal:

1. High-Gloss Alkyd Enamel: (Gutter, Doors and Lintels) Two finish coats over primer.

a. Primer: Galvanized metal primer.
b. First and Second Coats: Gloss alkyd enamel.

D. Wood / Millwork Moulding (Paint):

1. Low Lustre Finish Latex Enamel: Two finish coats over primer.

a. Primer: Oil based primer.
b. First and Second Coats: Gloss acrylic latex.

E. Fiber-Cement Products (Paint where called for on Drawings)

1. Satin Finish Acrylic: Two finish coats (min.) over factory primed products.

2. Comply with fiber-cement manufacturer's printed instructions for prepping and painting.

END OF SECTION

SECTION 102800 – TOILET ACCESSORIES

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 toilet and bath accessory items as scheduled on the drawings.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include the following:

1. Construction details and dimensions.
2. Anchoring and mounting requirements, including requirements for cutouts in other work and substrate preparation.
3. Material and finish descriptions.
4. Identify products using designations indicated on Drawings.

1.4 QUALITY ASSURANCE

A. Source Limitations: Provide products of same manufacturer unless otherwise approved by Architect.

1.5 COORDINATION

A. Coordinate accessory locations with other work to prevent interference with clearances required for access by people with disabilities, and for proper installation, adjustment, operation, cleaning, and servicing of accessories.

B. Inserts and Anchorages: Furnish accessory manufacturers' standard inserts and anchoring devices that must be set in concrete or built into masonry. Coordinate delivery with other work to avoid delay.

1.6 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace items that develop visible defects and that fail in materials or workmanship within specified warranty period.

1. Warranty Period: 5 years from date of Final Completion.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Stainless Steel: ASTM A 666, Type 304, 0.0312-inch (0.8-mm) minimum nominal thickness, unless otherwise indicated.

B. Brass: ASTM B 19 flat products; ASTM B 16 (ASTM B 16M), rods, shapes, forgings, and flat products with finished edges; or ASTM B 30, castings.

C. Steel Sheet: ASTM A 1008/A 1008M, Designation CS (cold rolled, commercial steel), 0.0359-inch (0.9-mm) minimum nominal thickness.

D. Galvanized Steel Sheet: ASTM A 653/A 653M, with G60 (Z180) hot-dip zinc coating.

E. Galvanized Steel Mounting Devices: ASTM A 153/A 153M, hot-dip galvanized after fabrication.

F. Fasteners: Screws, bolts, and other devices of same material as accessory unit and tamper-and-theft resistant where exposed, and of galvanized steel where concealed.

G. Chrome Plating: ASTM B 456, Service Condition Number SC 2 (moderate service).

H. Mirrors: ASTM C 1503, Mirror Glazing Quality, clear-glass mirrors, nominal 6.0 mm thick.

I. ABS Plastic: Acrylonitrile-butadiene-styrene resin formulation.

2.2 ACCEPTABLE MANUFACTURERS

A. Manufacturers and products listed establish required quality. Products, which are equal in quality, suited to same use and are capable of performing same function, as those names will be acceptable. Other acceptable manufacturers are; AJW, ASI and Bobrick.

Toilet Tissue Dispenser ("Basco" 7900 Series)

Dispenser shall be single roll type with concealed mounting. Roller shall be chrome. Flanges and support arms shall be chrome plated Zamac.

Towel Bar ("Basco" No. 7924A x Length Noted)

Towel bar shall be ¾" sq. polished aluminum with concealed mounting. Flanges and support arms shall be chrome plated Zamac.

Towel Ring ("Basco" 7900 Series)

Towel ring shall be fully chrome plated with concealed mounting. Flanges and support arms shall be chrome plated Zamac

Mirror

Float/plate glass mirror shall be guaranteed for 5 years against silver spoilage. Mirror shall be secured to wall with mastic as approved by mirror manufacturer.

Curved Shower Curtain Rod ("Bradley" 9530)

Shower curtain rod shall be 1" outside diameter and constructed of stainless steel, and include stainless steel mounting plates. Screw attached to solid wood blocking.

2.3 FABRICATION

A. General: No names or labels are permitted on exposed faces of toilet and bath accessory units. On either interior surface not exposed to view or on back surface, provide identification of each accessory item either by a printed, waterproof label or a stamped nameplate indicating manufacturer's name and product model number.

B. Surface-Mounted Toilet Accessories, General: Except where otherwise indicated, fabricate units with tight seams and joints, exposed edges rolled. Hang doors or access panels with continuous stainless steel piano hinge. Provide concealed anchorage wherever possible.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories according to manufacturers' written instructions, using fasteners appropriate to substrate indicated and recommended by unit manufacturer. Install units level, plumb, and firmly anchored in locations and at ADA compliant heights.

B. Secure mirrors to walls in concealed, tamperproof manner with special hangers, toggle bolts, or screws. Set units plumb, level, and square at locations indicated, according to manufacturer's instructions for type of substrate involved.

3.2 ADJUSTING AND CLEANING

A. Adjust accessories for unencumbered, smooth operation. Replace damaged or defective items.

B. Remove temporary labels and protective coatings.

C. Clean and polish exposed surfaces according to manufacturer's written recommendations.

END OF SECTION

SECTION 109000 - WARDROBE AND CLOSET SPECIALTIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS:

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK:

A. Extent of wardrobe and closet specialties is shown on drawings.

B. This section includes:

1. Coated, ventilated wire closet shelving with rod.
2. Coated, ventilated wire laundry shelving.

1.3 QUALITY ASSURANCE:

A. Manufacturer: Provide as complete units produced by a single manufacturer, including necessary mounting accessories, fittings, and fastenings.

B. Field Measurements: Take field measurements prior to preparation of shop drawings and fabrication, where possible, to ensure proper fitting of work.

C. Coordination: Coordinate delivery and installation with other work to avoid delay.

1.4 SUBMITTALS:

A. Product Data: Submit manufacturer's data and installation instructions for materials required.

1. Indicate locations of required blocking.

B. Samples: Submit samples of coated, ventilated wire shelving with rod, with manufacturer's standard finish.

PART 2 - PRODUCTS:

2.1 Provide shelving and all accessories required for a complete installation.

A. Shelving shall be epoxy coated, ventilated wire shelving and as noted below:

1. Closets: Shelving shall be 12" deep with integral clothes rod.
2. Laundry and Pantry: Shelving shall be 12” deep.

B. Wire shall be: All shelving materials shall be constructed of Grade C-1008 bright basic cold drawn steel wire with average tensile strength of 100,000 psi.

2.2 ACCEPTABLE MANUFACTURERS:

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products which may be incorporated in the work include, but are not limited to, the following:

1. Closet Maid, or equal.

2.3 MATERIALS AND MOUNTING HARDWARE:

A. All shelves shall be fabricated of heavy gauge welded steel rod with deck rod spacing of 1 inch increments.

B. Support braces shall be installed so that the shelf span between supports does not exceed 42 inches, and that the shelf be attached to the back wall using Back Clips at 12 inch intervals.

C. Under test conditions, the shelving shall support a uniform static load of 75 pounds per lineal foot of shelving when the span does not exceed (3) feet and is installed according to the manufacturer's recommendations.

D. All hardware components shall be attached to drywall without requiring mounting to conceal wall structural members.

E. Finish: Material shall be cleaned and covered with an iron phosphate coating to insure a proper bond with the finish coat. The finish coat shall be an epoxy powder coating to provide a hard, smooth, durable finish for a continuous protective coating.

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Erect shelving plumb, rigid, properly aligned, and securely fastened in place, complying with drawings and manufacturer's recommendations.

B. Provide additional field bracing as necessary for rigid, secure installation. Provide blocking as necessary.

END OF SECTION

SECTION 113100 - RESIDENTIAL APPLIANCES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes the following:

1. Electric ranges, range hoods, dishwasher, refrigerator/ freezers.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

PART 2 - PRODUCTS

2.1 APPLIANCES

A. **Range**: GE Electric Range, JBS460DMWW

B. **Exhaust Hood**: GE Exhaust Hood JVX5305DJWW

C. **Dishwasher**: GE Dishwasher GLDT690JWW

D. **Refrigerator/Freezer**: Brand, Size and Type to be coordinated with cabinets and adjacent construction. Final cabinet sizes and selections may need adjustment in coordination with appliances.

2.2 FINISHES, GENERAL

A. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. General: Comply with manufacturer's written instructions.

B. Provide all accessories required for a complete installation, including, cords, setting appliances in place, and final connection.

C. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

1. Provide anti-tip bracket at all ranges.

3.3 CLEANING AND PROTECTION

A. Test each item of residential appliances to verify proper operation. Make necessary adjustments.

B. Verify that accessories required have been furnished and installed.

C. Remove packing material from residential appliances and leave units in clean condition, ready for operation.

END OF SECTION

SECTION 122113 - HORIZONTAL LOUVER BLINDS

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 blinds, to be provided at each window in each Apartment.

1.3 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.

B. Product data for each type of horizontal louver blind specified. Include printed data on physical characteristics.

C. Shop drawings showing location and extent of blinds. Show installation details at and relationship to adjoining work. Include elevations indicating blind units. Indicate location of blind controls.

D. Samples for initial selection in the form of manufacturer's color charts showing the full range of colors, textures, and patterns available for each type of horizontal louver blind indicated.

1. Louver: Manufacturer's standard-size unit, not less than 12 inches (300 mm) long.

E. Maintenance data for horizontal louver blinds to include in the operation and maintenance manual specified in Division 1. Include the following:

1. Methods for maintaining horizontal louver blinds and finishes.
2. Precautions for cleaning materials and methods that could be detrimental to finishes and performance.

1.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide horizontal louver blinds identical to those tested for the following fire-test-response characteristics as determined by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.

1. Test Method: NFPA 701.
2. Rating: Pass.

B. Single-Source Responsibility: Obtain each type of horizontal louver blind from one source and by a single manufacturer.

1.5 PROJECT CONDITIONS

A. Field Measurements: Check actual horizontal louver blind dimensions by accurate field measurements before fabrication and show recorded measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

B. Space Enclosure and Environmental Limitations: Do not install horizontal louver blinds until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1.6 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels clearly describing contents.

1. Horizontal Louver Blinds: Before installation begins, furnish quantity of full-size units equal to 15 percent of amount of each size installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:

1. Horizontal Louver Blinds: Cordless

a. Select Binds, or equal.

2.2 HORIZONTAL LOUVER BLINDS

A. Headrail shall be manufacturer’s standard extruded PVC.

B. Bottomrail shall be manufacturer’s standard extruded hollow PVC.

C. Slats shall be made of extruded PVC. Slats shall be 2 inch wide.

1. Design: Faux wood

D. Cord lock shall be a snap-in design with metal roller and a floating locking pin and shall be crash proof.

E. Tilt wand shall be manufacturer’s standard.

F. Installation Brackets shall be manufacturer’s standard. Intermediate support brackets shall be supplied for blinds over 48”.

G. Provide per Architect's selections from manufacturer's full range of colors.

2.3 FABRICATION

A. Product Standard and Description: Comply with AWCMA Document 1029 for each horizontal louver blind unit consisting of louvers, rails, cord locks, tilting mechanisms, tapes, and installation hardware.

B. Lifting and Tilting Mechanisms: Non-corrosive, self-lubricating materials.

C. Unit Sizes: Obtain units fabricated in sizes to fill window and other openings as follows, measured at 74 deg F (23 deg C):

1. Blind Units Installed Between (Inside) Jambs: Width equal to 1/4 inch (6 mm) per side or 1/2 inch (12 mm) total, plus or minus 1/8 inch (3 mm), less than jamb to jamb dimension of opening in which each blind is installed. Length equal to 1/4 inch (6 mm), plus or minus 1/8 inch (3 mm), less than head to sill dimension of opening in which each blind is installed.

2. Quantity of blind units shall match quantity of windows in an opening.

D. Installation Fasteners: Not less than 2 fasteners per bracket, fabricated from metal non-corrosive to blind hardware and adjoining construction; support blind units under conditions of normal use.

E. Hold-Down Brackets: Manufacturer's standard, as indicated.

2.4 ACCESSORIES

A. Curtain Rod: Provide one (1) ½” wide aluminum tubular expandable curtain rod with mounting brackets, per window opening. Single Lock-Seam projects 2-1/2” or equal.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions for compliance with requirements for installation tolerances and other conditions affecting performance of horizontal louver blinds. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install blinds level, plumb, and located so headrail is 5/8” inset from face of gypsum board.

1. Do not install blinds on windows.
2. Install blinds with screws of sufficient length for metal studs.

3.3 ADJUSTING

A. Adjust components and accessories for proper operation.

3.4 CLEANING

A. Clean blind surfaces, according to manufacturer's instructions, after installation.

B. Remove surplus materials, packaging, rubbish, and debris resulting from installation. Leave installation areas neat, clean, and ready for use.

3. 5 PROTECTION

A. Provide final protection and maintain conditions in a manner acceptable to manufacturer and Installer that ensure that horizontal louver blinds are without damage or deterioration at the time of Substantial Completion.

END OF SECTION

SECTION 123530 - RESIDENTIAL CASEWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Kitchen cabinets.
2. Vanity cabinets.
3. Plastic-laminate countertops and backsplashes.

1.2 SUBMITTALS

A. Product Data: For cabinets, countertop material and cabinet hardware.

B. Shop Drawings: For cabinets and countertops. Include plans, elevations, details, and attachments to other work. Show materials, finishes, filler panels, hardware, edge and backsplash profiles, methods of joining countertops, and cutouts for plumbing fixtures.

C. Samples: For each type of material exposed to view.

1.3 QUALITY ASSURANCE

A. Quality Standards: Unless otherwise indicated, comply with the following standards:

1. Cabinets: KCMA A161.1.

a. KCMA Certification: Provide cabinets with KCMA's "Certified Cabinet" seal affixed in a semiexposed location.

2. Plastic-Laminate Countertops: KCMA A161.2.

3. Corners: of cabinets shall have a complete finished panel to enclose off all dead spaces (ex. adjacent to ranges)

B. Field Measurement: Verify sizes and shapes of countertops prior to fabrication by field measurements taken after base cabinets are installed.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING:

A. Protect wood cabinets and countertops during transit, delivery, storage and handling to prevent damage, soiling and deterioration.

B. Do not deliver wood cabinets and countertops until painting, wet work, grinding and similar operations, which could be performed before installation of cabinets, have been

completed in installation areas. Store cabinets and countertops in installation areas, or if that is impracticable, in areas similar with ambient conditions.

1.5 JOB CONDITIONS:

A. Conditioning: Comply with cabinet manufacturer's recommendations for temperature and humidity requirements in cabinet installation areas. Do not install cabinets and countertops until required temperature and relative humidity have been stabilized and will be maintained in installation areas.

B Maintain temperature and humidity in installation areas as required to maintain moisture content of installed cabinet work within a tolerance range of the optimum moisture content acceptable to cabinet manufacturer, from date of installation through remainder of construction period.

1.6 FABRICATION

A. Contractor shall be responsible for field verification of dimensions prior to fabrication and installation of cabinets.

B. Corners: of cabinets shall have a complete finished panel to enclose off all dead spaces (ex. adjacent to ranges)

PART 2 - PRODUCTS

2.1 CABINET HARDWARE

A. General: Manufacturer's standard units complying with BHMA A156.9, of type, size, style, material, and finish noted.

B. Pulls: None.

C. Hinges: Heavy duty, high quality steel, concealed hinge with self-closing feature.

D. Drawer Guides: High quality epoxy coated steel, Extreme Grade, side mounted guides, self-adjusting in mounting brackets. Mounting brackets shall be screwed to solid pine back hanging rails. Guides shall have built-in stop, self-closing and stay – closed features with a 100 lb. rated load capacity.

E. Finish: Furniture quality protective finish system on doors, drawer fronts, front frames and veneer and panels consisting of sanding, stain, sealer and clear top coats.

2.2 COUNTERTOP MATERIALS

A. Plastic Laminate: High-pressure decorative laminate complying with NEMA LD 3.

1. Grade: High Pressure Plastic Laminate 0.028” thick.

2. Colors, Textures, and Patterns: As selected by Architect from plastic-laminate manufacturer's FULL range. Color will vary from unit to unit.

B. Particleboard: ANSI A208.1, Grade M-2.

C. The perimeter of the bottom of counter tops and sink cut outs shall be sealed with varnish.

2.3 CABINETS

A. Provide by the following manufacturer:

1. ACPI Brand, Advanta; “Extreme Series”.

2. Style shall be Tuscany. Oak not permitted.

3. Finish as selected by Architect from manufacturer’s full range.

B. Front Frame: ¾” thick kiln dried solid hardwood. Mortise and tendon or bore and dowel construction frame joinery reinforced with glue and nails. Stiles shall be 1 ½” wide. Mulls shall be 3” wide. Rails 1 ¾” wide. Stiles and top of bottom rails to be dadoed to receive ends, tops and bottoms.

C. End Panels: Nominal ½” thick, 2-2 grade multi-ply Type 1 exterior glue hardwood plywood, dadoed to receive tops and bottoms. Ends to be inserted into dado in face frame and recessed 3/16” and rabbeted to receive backs.

D. Back Panel: Nominal ¼” thick hardwood plywood. Securely glued and stapled to rabbets in ends and hang rails.

E. Hanging Rails: Walls cabinets shall have nominal ¾” thick, 3 ½” high multi-ply hardwood plywood, running full cabinet length at the top and bottom. Base cabinets shall have nominal ¾” thick x 7 ¼” high solid pine at the top. All hang rails are rabbeted to inset in end panels and to receive backs.

F Shelves: Nominal ½” thick, 2-2 grade multi-ply hardwood plywood. 10 7/8” deep with hardwood veneer banded front edge. Shelves are fixed into dadoes in end panels on all cabinets.

G. Top / Bottom Panels: Nominal ½” thick, 2-2 grade hardwood plywood. Tops and bottoms let into end panels, front rails and hang rails, glued and stapled. Bottoms are supported at rear of base cabinets by nominal ½” thick multi-ply hardwood plywood.

H. Toe Board / Kick: Nominal ¾” thick, ACQ pressure treated toe board between end panels. Color match toe board/ kick to match cabinet.

a. Toe Board/ Kick shall be integral with the Base Cabinet construction. A separate toe board/ kick base and separate base cabinet is not allowed.

I. Base Corner Braces: Two ¾" x 1 ½" solid hardwood or hardwood plywood corner braces running full depth front to back of cabinet. All braces to be glued and pinned at top of cabinets to front frame, rear hanging rails and end panels.

J. Drawers: 11/16" thick solid pine lumber four-sided drawer box. Ends are in drawer side dadoes. Drawer bottoms are to be min ¼" thick, hardwood plywood dadoes into all four drawer box sides. All drawer parts are to be glued and stapled together.

2.4 PLASTIC-LAMINATE COUNTERTOPS

A. Configuration: Provide countertops with the following front, cove (intersection of top with backsplash), backsplash, and endsplash style:

1. Front: Rolled. Provide wood-trimmed edge where indicated.
2. Cove: Cove molding (one-piece postformed laminate supported at junction of top and backsplash by wood cove molding. Provide applied (backsplash rests on top forming seam at inside corner) where indicated.
3. Backsplash: Curved or waterfall shape. Provide square edge where indicated.
4. Endsplash: Square edge.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cabinets with no variations in flushness of adjoining surfaces; use concealed shims. Where cabinets abut other finished work, scribe and cut for accurate fit. Provide filler strips, scribe strips, and moldings in finish to match cabinet face.

B. Install cabinets without distortion so doors and drawers fit openings and are aligned. Complete installation of hardware and accessories as indicated.

C. Install casework level and plumb to a tolerance of 1/8 inch in 8 feet (3 mm in 2.4 m).

D. Fasten cabinets to adjacent units and to backing.

1. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches (600 mm) o.c. with No. 10 wafer-head screws sized for 1-inch (25-mm) penetration into wood framing, blocking, or hanging strips.
2. Fasten wall cabinets through back, near top and bottom, at ends and not less than 24 inches (600 mm) o.c., with toggle bolts through metal backing behind gypsum board.

E. Fasten plastic-laminate countertops by screwing through corner blocks of base units into underside of countertop. Form seams using splines to align adjacent surfaces, and secure with glue and concealed clamping devices designed for this purpose.

F. Adjust cabinets and hardware so doors and drawers are centered in openings and operate smoothly without warp or bind. Lubricate operating hardware as recommended by manufacturer.

3.2 CLEANING AND PROTECTION:

A. Repair or remove and replace defective work as directed upon completion of installation.

B. Clean exposed and semi-exposed surfaces, touch-up finish as required. Remove and refinish damaged or soiled areas.

C. Protection: Contractor shall provide final protection and maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

1. Cover completed work with 4-mil polyethylene protective enclosure, or other product acceptable to the manufacturer, applied in manner to allow easy removal without damaging cabinets or adjoining work. Remove cover immediately before time of final acceptance.

END OF SECTION

PLUMBING INDEX

SECTION NUMBER

DIVISION 22 – PLUMBING

SECTION 22 01 00 – GENERAL PROVISIONS FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers the general arrangement of the plumbing systems and related items to complete the work as shown on the drawings and as specified herein.

B. The General and Special Conditions and all other Contract Documents are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

C. The Contractor shall familiarize himself with the work of all other trades, general type construction and the relationship of his work to other sections. He shall examine all working drawings, specifications and conditions affecting his work. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify all dimensions in the field and advise the Engineer of any discrepancy before performing any work.

D. The work shall include complete testing of all equipment and piping at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment.

E. The Contractor shall perform all necessary temporary work during construction.

F. Work under this section shall conform to all governing codes, ordinances and regulations of the City, County and State.

G. The Contractor shall be responsible for all errors in fabrication, for the correct fitting, installation and erection of the various plumbing systems as shown on the drawings.

1.2 SCOPE

A. This branch of the work includes coordination with all utility companies; providing utility meters; utility tap on fees; agency review fees and all inspection fees; all labor, materials, tools, excavation and backfill and all equipment necessary for the installation of Plumbing Systems as shown on the Drawings and Specifications and/or as required for complete and operating systems. The work shall include starting, balancing and the necessary and required tests to insure the proper operation of the complete system.

B. A complete and operating plumbing system shall be provided. See plans for diagrams and details.

C. All work for this project must comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC and all local codes and regulations.

D. In general (as a minimum) all materials and equipment must be installed in strict accordance with manufacturer's requirements; and provided with all required controls, internal fusing, relays, piping connections, electrical connections, etc., to provide for complete and operable systems.

1.3 PERMITS, FEES, CODES AND APPROVALS

A. Permits and Fees

1. All permits, tap on fees and agency review and inspection fees necessary for the complete Fire Protection and Plumbing systems shall be obtained by the Contractor from the authorities governing such work. The cost of all permits shall be borne by the Contractor.

B. Codes

1. The minimum standard for all plumbing work shall be the requirements of the Kentucky State Plumbing Law, Regulation and Code, Kentucky Building Code, ADA, The Division of Water Quality, and local ordinances. All plumbing and fire protection for this project must as a minimum comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC, The Division of Water Quality and the "Standards of Safety" of the Commonwealth of Kentucky.

C. Approvals

1. All work must be approved by the Architect/Engineer, Owner and all related Code Agencies before final payment will be made.

2. As a minimum, the following approval Certificates of Inspection and Approval shall be required:

a. Plumbing Inspection

b. Health Department Inspection

c. Electrical Inspection

d. Local and State Building Inspections.

3. Final payment will be contingent upon all Approval Certificates.

1.4 DRAWINGS AND SPECIFICATIONS

A. Contract drawings for work under this section are in part diagrammatic, intended to convey the scope of work and indicate the general arrangement of equipment, piping and the approximate size and location of equipment and outlets. The Contractor shall follow these drawings in laying out his work and shall verify spaces in which his work will be installed, indicating to the Engineer where any conflicts or overlapping of systems occur. Any item of work not clearly included, specified and/or shown, errors or conflict between Plans (Plumbing, Mechanical, Architectural, Structural or Electrical), Specifications, codes and field conditions, shall be clarified by a written request to the Architect by the Bidder before bidding; otherwise, the bidder shall, at his own expense, supply the proper labor and materials to include these items of work and to make good any damages or defects in his work caused by such error, omission or conflict. Under no circumstances shall a Contractor scale the Drawings for the location of equipment and work.

B. Where job conditions require reasonable changes in indicated locations and arrangement, proposed departures shall be submitted with detailed drawings to the Engineer for approval before any of the proposed work is commenced. All approved departures shall be made at no additional cost to the Owner.

C. The drawings and the specifications are intended to indicate complete and working systems, unless specifically indicated to the contrary. The work includes the furnishing, installing, and connecting of a complete working installation in each case to the full extent set forth in the drawings and herein specified. The Contractor shall be responsible for the complete functioning system, unless specifically noted otherwise.

D. The drawings and specifications constitute the Contract Documents and shall be considered as cooperative. Work and material included in either, though not mentioned in both, shall be a part of the work to be accomplished and shall be carried out completely in as thorough manner as if covered by both. All items shown on the drawings and/or listed in the specifications shall be provided and installed by the Contractor unless specifically noted that it will be provided and/or installed by others. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

E. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and shall arrange such work, accordingly, furnishing such fittings, pipe, traps, valves, and accessories as may be required to make a functional installation at no additional cost to the Owner.

F. Plumbing as built "Record Drawings" shall be kept up to date each day. "Record Drawings" shall be reviewed by Architect/Engineer each month with contractor's pay request review.

G. Any deviation in work as shown on plans and specifications must be approved in writing by Architect/Engineer prior to installation.

1.5 EXAMINATION OF SITE

A. Bidders shall visit the site before submitting proposals to satisfy themselves as to the nature and scope of the work and any difficulties attending to the execution.

B. The submission of a proposal will be construed as evidence that such an examination has been made. Later claims for labor, equipment, materials, etc., required for difficulties encountered which could have been foreseen had such an examination been made, will not be recognized.

1.6 EQUIPMENT DESIGN AND INSTALLATION

A. The design, manufacture, testing and method of installation of all apparatus and materials furnished under the requirements of these specifications shall conform to the applicable standard rules of the following. Where materials are not specifically referred to, but are required, they shall meet the requirements of the applicable code.

1. NEMA -National Electrical Manufacturer's Assoc.
2. UL -Underwriter's Laboratories, Inc.
3. ASME -American Society of Mechanical Engineers
4. ASTM -American Society of Testing Materials
5. ASHRAE -American Society of Heating, Refrigerating and Air Conditioning Engineers
6. BOCA -Building Officials & Code Administrators International, Inc.
7. NFPA -National Fire Protection Association
8. AWWA -American Water Works Association
9. AWS -American Welding Society
10. AMCA -Air Moving and Conditioning Assoc.
11. ANSI -American National Standards Institute
12. NEC -National Electrical Code
13. AIEE -American Institute of Electrical Eng.
14. ARI -Air Conditioning & Refrigeration Institute
15. SMACNA -Sheet Metal and Air Conditioning Contractors National Assoc.
16. LSDHBC -Local and/or State Division of Housing, Building and Construction
17. SPC -State Plumbing Code
18. NPC -National Plumbing Code
19. OSHA -Occupational Safety and Health Adm.

20. EPA -Environmental Protection Agency
21. DOE -U.S. Department of Energy
22. IMC -International Mechanical Code
23. IECC -International Energy Conservation Code

B. Unless otherwise specified, equipment and materials of the same type and used for the same purpose, shall be products of the same manufacturer.

1.7 CAPACITIES, SIZES AND OPERATING CONDITIONS

A. Capacities, sizes, and conditions specified or shown on drawings shall be regarded as minimum allowable. If the Contractor proposes to furnish any equipment which would have to operate at other than specified conditions to produce final effects, all other directly or indirectly related components of the entire systems (as well as of the structure, finish and other systems in the building) must be properly coordinated to the satisfaction of the Engineer. That is: Operating conditions through the entire system must be such that no motor is overloaded, no equipment operates noisier, faster, or hotter than manufacturer's publication recommends and that no excess stress or demand is imposed on any component of any system or the structure; also that no quality, architectural feature, function or "end result" is affected adversely, in the opinion of the Architect.

B. The Architect/Engineer reserves the right to determine if the contractor's proposed materials and equipment of any one manufacturer is acceptable in lieu of the specified material or equipment.

C. Where materials and equipment are listed on Drawings and specifications as acceptable or equivalent, this does not relieve the contractor and/or manufacturer from providing and proving to Architect/Engineer that their materials and equipment are equivalent to items the Architect/Engineer used as a guide specification.

D. The contractor and manufacturer must confirm to the Architect/Engineer that their equipment and materials will meet the space requirements of the project and that the equipment is easily accessible for maintenance and operation.

E. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

1.8 LAYOUT

A. The Contractor's work lines, and established heights shall be in strict accordance with drawings and specifications insofar as these drawings and specifications extend. The Contractor shall verify all dimensions shown and establish all elevations and detail dimensions not shown. He shall also correlate the time so that the work will proceed to the best advantage of the complete job as a unit. The Contractor shall be responsible for furnishing in ample time, any information required to revise footing elevations, build all chases and openings in floors, walls, partitions, ceilings, and roofs to provide clearance which may be required to accommodate the work. The contractor shall set all sleeves, anchor bolts and inserts required to accommodate his equipment before masonry is constructed.

B. The Contractor shall layout his work well enough in advance to foresee any conflicts or interferences with work of other sections so that in case of interference, his layout may be altered to suit the conditions, prior to the installation of any work. This procedure will require constant coordination with all sections of the work.

1.9 DEMOLITION AND SCHEDULE

A. All existing plumbing equipment noted on drawings and listed herein that is to be removed or demolished, shall be removed on schedule and disposed of as hereinafter directed.

B. All items removed shall become the property of the contractor and shall be immediately disposed of offsite at contractor’s expense except as noted on drawings unless otherwise directed by owner.

C. All demolition shall be carefully accomplished in accordance with master construction schedule so as not to remove any item required for support operation during the planned schedule. No item shall be removed until full schedule is worked out with contractors according to owners demands and agreed to in writing by the Engineer.

D. Storage will be arranged during scheduling process. Contractors to provide own storage and security.

E. Contractor doing the demolition of equipment must conform to the Clean Air Act of 1990. Refrigerant must be recovered from any air conditioning or refrigeration equipment prior to disconnecting and disposal. The contractor must own and use recovery equipment to meet this requirement. The contractor will be responsible for disposal of refrigerant, refrigerant oil, or equipment.

F. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damage or unserviceable portion and replace with new products of equal capacity and quality. All existing piping to remain shall be permanently capped, new or existing valves are not adequate.

1.10 ACCESSIBILITY

A. All equipment, valves, motors, traps, unions, and all other items which require adjustment, maintenance, repair, and observation shall be installed in such a fashion that such maintenance, repair, and observation can be readily achieved without undue difficulty. Where the drawings show these items in locations not conforming to the above, the Contractor shall advise the Architect/Engineer of this conflict prior to bid Date otherwise he shall, at his own expense, relocate such items as directed by the Architect/Engineer. Where such items are installed above inaccessible ceilings or in or behind walls, this contractor shall provide approved access panels unless otherwise directed in these Specifications.

1.11 ARCHITECTURAL DRAWING AND SPECIFICATIONS

A. Each Contractor shall refer to the Architectural and Structural Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for location of walls, partitions, beams etc., and shall be guided accordingly for the setting of all sleeves and equipment.

B. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

1.12 COOPERATION WITH OTHER CONTRACTORS

A. Each Contractor shall demand and examine all Drawings and Specifications pertaining to the construction before installing the work described and shown under these Drawings and Specifications. Each Contractor shall cooperate with all other contractors in locating piping, openings, chases, and equipment in order to avoid conflict with any other contractor's work. It is the responsibility of all trades to examine all shop drawings of other trades that would require equipment to occupy the same space and plane within the building to eliminate any potential conflicts. No extra payment will be allowed for relocation of piping, and equipment not installed in accordance with the above instructions, and which interferes with work and equipment of other contractors.

1.13 INSTALLATION OF EQUIPMENT

A. All appliances, materials and equipment shall be installed and connected in accordance with the best engineering practice and in accordance with manufacturer's instructions and recommendations. All auxiliary piping, special controls, water seals, valves, electrical connections, drains, etc., recommended by the manufacturer, required for proper operation, or required by code shall be furnished and installed complete.

B. All equipment designed and constructed for indoor use shall not be shipped to the site until such time that the equipment is ready for permanent installation in a dry building or may be stored on site provided equipment is stored in a water and moisture tight storage building or job trailer. Covering equipment outdoors with plastic or tarp is not acceptable.

1.14 PROTECTION

A. No piping shall be installed in any part of the building where danger of freezing may exist without adequate protection being given, whether insulation is specified for the particular piping. All damage resulting from leaking pipes shall be borne by the Contractor under this Division.

B. All work, equipment and materials shall be protected at all times. All pipe openings shall be closed with caps or plugs during construction. All equipment and accessories shall be tightly covered and protected against dirt, water, or other injury during the period of construction.

1.15 CUTTING AND PATCHING

A. All cutting and patching required in connection with the installation of this work, and work due to errors, defective work, ill-timed work or tardiness in properly designating size and location in sufficient time or by failure to notify other trades, shall be done under this section, but only in the manner directed by the Engineer so as to prevent or minimize damage to installed work. Damage as a result of cutting for installation, shall be repaired by mechanics skilled in the trade involved, at no additional expense to the Owner.

B. No cutting of structural members will be permitted, except when prior permission of the Engineer has been obtained. This work must conform in every respect to the surrounding finish and to the quality of workmanship and materials used.

C. Piercing of any waterproofing or roofing shall be done only by the trade involved. After the part piercing the waterproofing has been set in place, the opening made for this purpose shall be filled and made absolutely watertight to the satisfaction of the Engineer.

D. See Section: 220517 - SLEEVING, CUTTING, PATCHING AND REPAIRING

1.16 FIRE AND SMOKE-STOPPING

A. Fire-stopping and smoke-stopping shall be provided around all piping penetrations of fire rated and/or smoke-rated floors, walls, ceilings, or other barriers.

B. The materials used shall be UL 263 or UL 1479 classified and meet ASTM E814 standards and be rated for assemblies where applied.

C. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

D. Install penetration seal materials in accordance with manufacturer's instruction.

E. Seal holes or voids may be penetrations to ensure an effective fire and/or smoke barrier.

F. Protect materials from damage on surfaces subject to traffic.

G. Stop insulation flush with wall on insulated pipe and seal edges.

H. All exposed piping passing through floors, ceilings and walls in finished areas shall be fitted with a chrome plated escutcheon of sufficient outside diameter to amply cover the sleeved opening and ad inside diameter to closely fit the pipe around which it is installed.

1.17 CONCRETE WORK AND ANCHOR BOLTS

A. The Contractor under this Division shall provide all concrete bases, curbs and pads for all floor and ground mounted equipment unless otherwise indicated.

B. The Contractor under this Division shall verify the sizes and locations of all supports, bases, and pads prior to pouring of same to be certain that the installed units will be compatible.

C. The Contractor under this Division shall set anchor bolts when required for the equipment prior to pouring of concrete. Sizes and exact locations of bolts shall be determined by the manufacturer's recommendations for the equipment served.

D. Concrete work must be provided in strict accordance with Section 03 Concrete Work. As a minimum provide pads using 3500 psi concrete not less than 3.5 inches high reinforced with WI.4 x WI.4 welded wire fabric. Chamfer top and edge corners with 3/4" preformed chamfer strips. Subbases shall rest on structural floor and shall be reinforced with steel rods and interconnected with floor reinforcing bars by tie bars hooked at both ends or suitable dowels. Slope top to floor drain if drain is provided in pad.

1.18 ACCESS PANELS

A. The Plumbing Contractor shall furnish all other access panels needed for access to valves, open receptacles, etc., in inaccessible locations installed under this Division of the work.

B. Access panels shall have a minimum size of 12" x 12" and shall be centered beneath equipment for accessibility and maintenance. Access panels must be of adequate size to service, observe, remove, and maintain equipment.

C. Access panels shall be equal to the types specified under the Architectural Specifications. As a minimum the access panels shall be equivalent to Acudor Products, Cendrex, Inc., MIFAB, Inc., Lane-Aire Manufacturing, 14 gauge with vandal proof lock and frame as selected by Architect. Access panels shall be fire rated when installed in fire rated construction.

D. Access panels shall have a primed white finish.

E. Ceiling Types

1. In areas with suspended acoustical tile ceilings (installed on exposed metal grid suspension system so that the tile may be readily removed), equipment, valves, etc., install above these ceilings will be accessible.

2. All plastered ceilings or ceilings having concealed spline type of suspension system will be considered as not removable for accessibility to equipment; therefore, access panels will be required.

3. See Architectural Drawings and Specifications for the types of ceilings throughout the building.

F. Access panels shall be installed by sub-contractor specialized in access panel installation.

1.19 CONNECTION TO EQUIPMENT SPECIFIED IN OTHER SECTIONS

A. Examine all Contract Documents and be thoroughly familiar with all items of equipment in other sections or by Owner, unless otherwise specified or indicated on Drawings. Rough-in for and make final connections to all equipment which requires any of the services specified in this Section and including furnishing and install all valves, P-traps, unions,

vacuum breakers and all other specialties as required to make all work and equipment final and operating. It is the intent of the Contract Drawings to detail and indicate all such equipment; however, be responsible for notifying Architect/Engineer in writing of major discrepancies seven (7) days prior to Bid Date; otherwise, all such connections shall be made at no extra cost.

B. Unless specified otherwise, all conduit, wiring and connections for power to plumbing equipment will be provided by Electrical Contractor. Be responsible for correct sequences of operation of all plumbing equipment after all wiring has been completed.

1.20 OPERATING INSTRUCTIONS

A. After all tests have been completed and work accepted by the Owner, a competent representative shall, at a time determined by the Engineer, present verbal, and visual instructions to the Owner's personnel in the proper operation of his respective system. For this purpose, each section of work shall be demonstrated and explained to the Owner's personnel and sufficient time allotted for instructions. See Specification Section 220600.

1.21 SAFETY

A. The contractor and his subcontractors for the project shall comply with all applicable Federal, State, and local laws governing safeguards, safety devices, and protective equipment and shall take all other needed actions which they may determine or which the Department may determine to be reasonably necessary to protect the life and health of all employees and personnel on the project, provide for the safety of the public and protect all property affected by the performance of the work covered by the contract.

B. As provided in KRS Chapter 338 in the Kentucky Occupational Safety and Health Act and in subsequent regulations and standards promulgated by the Kentucky Occupational Safety and Health Standards Board, neither the Contractor nor his subcontractors shall require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

C. The contractor shall not remove or disturb any suspected hazardous materials, including asbestos-containing materials, lead based paints, electrical equipment containing PCB’s, or any other except as instructed in this contract. If any material not covered by the contract is encountered, notify the Engineer immediately.

1.22 TESTS - GENERAL

A. All tests required to establish the adequacy, quality, safety, completed status and suitable operation of each system and all components thereof shall be made in the presence of and to the satisfaction of the Engineer or his authorized representative and other representatives of State and local Government. All instruments, labor, and expert service necessary to conduct these tests shall be supplied by the Contractor; power and fuel will be furnished by the Owner.

B. The final inspection and tests are to be made only after the Engineer is satisfied that the work described in these specifications has been completely installed in accordance with the true spirit and intent of these specifications and that complete preliminary tests were made which indicate adequacy, quality, completion and satisfactory operation. The acceptance of the work herein specified, shall not in any way prejudice the Owner's right to demand replacement of defective material and/or workmanship.

1.23 CLEANING

A. General: Clean all piping and equipment systems as required to leave the piping and equipment clean and free from scale, silt, contamination, etc., as normally required and as specified herein.

B. Utilities and Equipment: The Contractor shall provide all necessary temporary materials and equipment to clean the piping and equipment installed under this specification. No permanent equipment shall be used for storage, mixing, settling, compressing, pumping, etc., without the approval of the Architect. The Contractor shall supply a separate and independent source of clean, dry, oil-free air for the blowdown of systems requiring this method of cleaning.

C. Use of Chemicals: No chemicals, wetting or drying agents shall be used to clean systems or equipment where the materials of the system undergo any changes in their physical or structural characteristics. In case of any doubt as to the compatibility of any materials to the cleaning solution used, the Contractor shall obtain prior written approval for the use of the solution from the manufacturer of the equipment. Piping systems, equipment and sub-assemblies shall be cleaned after completion of welding, machining, threading, testing and any other operations capable of contaminating the system piping or equipment. After cleaning, the permanent strainers shall be removed, cleaned, and replaced. Temporary strainers shall be periodically removed, cleaned, and replaced during cleaning in lines ahead of equipment to protect against particles becoming lodged in the equipment.

D. After the Architect/Engineer has complete examination, this Contractor shall remove all stickers, tags, etc., and shall thoroughly clean all equipment, fixtures, and materials installed under his section of the work.

E. Surplus material, rubbish and equipment resulting from the work shall be removed from the building and premises by the Contractor upon completion of the work in accordance with the General Conditions.

F. All equipment shall be thoroughly cleaned to "Factory New" condition prior to turning over to owner. Touch up or completely repaint equipment as required.

G. Keep all nameplates on equipment clean and exposed for easy reading.

1.24 WARRANTY AND SERVICE

A. All equipment shall be warranted for a period of at least one (1) year from the date of acceptance, as evidenced by date of substantial completion for the entire project or for the last phase of the project, whichever occurs later, against defective materials, design, and workmanship. In addition to the equipment warranty, the Contractor shall provide all repair and adjustment service necessary for the proper operation of the entire system for a period of one (1) year after the date of acceptance, as evidenced by the date of substantial completion for the entire project or for the last phase of the project, whichever occurs later. Upon receipt of notice from the Owner’s representative of failure of any part of the warranted system or equipment during the warranty period, the affected part shall be replaced promptly with a new part without cost to the Owner. Upon failure to take action within 24 hours after being notified, the work will be accomplished by the Engineer at the expense of the Contractor. See General Conditions and individual equipment specifications. Note that the warranty period of time specified in this section represents the minimum warranty period required for work performed under specification Division 21, 22 and 23. Where the General Conditions and/or individual equipment/system specifications require a warranty period of longer duration or earlier start date than specified in this paragraph, the longer duration/earlier start date shall supersede for those portions of work covered by that specification. In the event the contractor is notified of warranty issues but does not correct or address the warranty issues prior to the end of the specified warranty period, the contractor will not be relieved of the responsibility to correct the deficient items after the warranty end date has passed.

B. Make a minimum of two (2) service calls during guarantee period, free of charge, to check with Owner and to check and repair malfunctioning equipment which was installed. Service calls shall be in middle and end of guarantee period and as required to maintain

systems operation. Dates shall be listed in operating and maintenance manuals, along with contractor's name and phone number.

1.25 ELECTRIC MOTORS

A. All motors shall be designed, tested, and applied in accordance with the applicable standards listed hereinbefore. Motors shall be of sufficient size for the duty to be performed and shall not exceed the full load rating when the driven equipment is operating at specified capacity. Unless otherwise specified, all motors shall be high efficiency type and shall have open frames and continuous-duty classification based on 50 degrees C. ambient temperature. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting-current characteristics. Motors shall meet NEMA high efficiency standards MGI - 1.41.2 for energy efficient polyphase squirrel-cage motor. Efficiency shall be in accordance with MGI - 1.2.55. When motor horse powers required differ from those indicated on the drawings, the Contractor shall make the necessary adjustments to the wiring, disconnect devices, starters, and branch-circuit protection at no additional cost to the Owner.

1. Motors shall be rated for continuous duty capable of driving the connected loads without exceeding temperature limitations of the motor insulation. Special Class A moisture-resisting insulation (designed to operate in a 50-degree C. ambient without exceeding a temperature rise rating designated by NEMA for the type of enclosure used) shall be utilized in each motor.

B. Unless otherwise indicated or specified, the electrical components required to operate plumbing equipment, such as, motors, float and pressure switches, solenoid valves, and other devices functioning to control the plumbing equipment, shall be furnished as part of the plumbing equipment, shall be complete and operable, and shall be included under this section of the specifications. All motor starters not part of a motor control center shall be included under this Section and shall be the hand off auto type with 3 over-loads on 3 phase units and 120V control transformer. Conduit and wires required for external electrical connections shall be furnished and are specified under DIVISION 26 - ELECTRICAL. Integral phase failure relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Plumbing contractor shall coordinate staggered restart times as required.

1.26 AS-BUILT DRAWINGS

A. The Contractor shall deliver to the Engineer at the completion of the work, one (1) print of "As-Built" drawings, showing legibly and accurately, plumbing and piping systems with equipment locations shown as actually installed. Changes in original plans shall be neatly shown in red pencil. Each print shall be signed by the sub-contractor who has done the work.

B. During construction, the Contractor shall retain a set of blue line drawings on the site for recording all changes. These drawings shall be available for inspection by the Engineer.

1.27 TESTS

A. The Architect/Engineer shall be notified by the Contractor under this Division forty-eight (48) hours in advance of any tests so that the Architect/Engineer or his representative may be present when the tests are run. Leaks or imperfections found shall be corrected and a new test shall be run to the satisfaction of the Architect/Engineer. Upon successful completion of the test, pipe covering may be applied, and piping may be concealed. A successful test, even if witnessed, however, does not relieve the Contractor under this Division of the responsibility for any failure during the guarantee period.

B. After pipe fabrication has been completed, all water piping shall be subjected to a hydrostatic test of 100 psi and proven tight and free of leaks for a 24-hour period. Tests

shall be applied to the piping before being attached to any equipment which would be damaged by the test pressure. Damage to equipment caused by testing shall be repaired or replaced without additional cost to the Owner.

C. The sanitary sewer piping and sanitary waste, vent and drainage piping installed under this Division in, under or outside the building shall be tested by means of water, smoke or air in accordance with the Kentucky State Plumbing Law, Regulation and Code, Division of Water Quality and the local utility company requirements. These shall be made in the presence of the Plumbing Inspector and the Architect/Engineer.

D. Exterior water piping shall be tested in strict compliance with local water company. The minimum hydrostatic test pressure is 1 1/2 times the water pressure serving the site.

E. No insulation, paint, backfill or other prohibitive covering shall be applied to piping prior to the above tests.

F. Provide all temporary equipment, materials, valves, gauges, etc., required for the preceding tests.

G. The expense of all tests shall be borne by the Contractor under this Division.

1.28 CONTRACTOR FURNISHED DRAWINGS, DESCRIPTIVE DATA AND MANUALS

A. Approval of Materials and Equipment: Within 30 days of receipt of notice to proceed, and before starting installation, the Contractor shall submit to the Architect for approval, in triplicate, lists of materials, fixtures and equipment to be incorporated in the work. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project and the reasons therefore shall be submitted with drawings. Where such departures require piping or equipment to be supported otherwise than shown, the details submitted shall include loadings and type and kinds of frames, brackets, stanchions, or other supports necessary. Approved departures shall be made at no additional cost to the Owner. The lists of materials and equipment shall be supported by sufficient descriptive material, such as catalog cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirements; catalog numbers alone will not be acceptable.

B. Conformance to Agency Requirements: Where materials or equipment are specified to be constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers, the Air Moving and Conditioning Association, or the American Society of Heating, Refrigerating and Air Conditioning Engineers, or to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this specification conform to such requirements. A certificate or published statement by the manufacturer will be sufficient evidence that the item conforms to the specified requirements. In lieu of such stamp, certificate, or statement, the Contractor may submit written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing, of the specified agencies.

C. Shop Drawings

1. In accordance with the General Conditions, shop drawings shall be submitted on all units of prefabricated materials. Shop drawings shall show, in detail, all parts of the work, fully dimensioned and shall also indicate construction, concealed and other jointing, thickness of materials, method of anchoring and attachment to other materials. Where required for certain work, submit setting and bending diagrams and mark same to correspond with the design drawings, identifying locations of various items. Show types, sizes and locations of sleeves and inserts.

2. The Contractor shall check all shop drawings for completeness and for correctness before submitting the drawings. If major corrections are required on the drawings, the Contractor shall return the drawings to the originator and have the changes made. The Contractor shall indicate his corrections on the prints in green pencil and sign all prints and other material sent to the Engineer.

3. Detail and Erection Drawings: Detail and erection drawings for equipment, piping and other items of this nature shall be carefully prepared in accord with standard practice and shall show erection plans and member details with all individual parts identified on both the detail sheets and erection plans. All identification markings shall be carefully preserved until after the erection process is completed.

4. Material Data: The Contractor shall submit descriptive data, as required, on pipe, fittings, and valves to be incorporated into the work. This data shall be in sufficient detail to allow the Engineer to determine that the pipe, fittings, and valves meet the requirements of the contract drawings and specifications or that they are an acceptable equal to that specified. All data shall be in the form of manufacturer's or supplier's literature concerning the product and shall indicate catalog number, conditions of use, application instructions, and/or other information as applicable.

5. Equipment Data: The Contractor shall submit descriptive data on all items of equipment to be furnished and installed under this contract. These submittals shall consist of manufacturer's published catalog information which completely describes component materials, configuration and rough-in data for plumbing and electrical equipment shall also include cuts, diagrams, characteristic curves, and capacity information as applicable. Where more than one item of equipment is employed in the same system, the submittal of equipment data will include special diagrams showing the electrical wiring, interconnecting piping, related controls and relation and operation of the various items of equipment for the entire system.

D. Operating Instructions and Maintenance Manuals, Etc.

1. At completion of the contract, the Owner shall be provided with three (3) bound copies of operations and maintenance instructions, recommended list of spare parts required for a period of one (1) year and a list of any special tools required to maintain the equipment for the various items of the plumbing equipment. Where special tools are required, the Contractor shall furnish two (2) of each such tools to the Owner at no additional contract cost.

2. MANUAL SHALL INCLUDE ALL APPROVED SHOP DRAWINGS OF EQUIPMENT REQUIRING OPERATION AND MAINTENANCE INFORMATION.

3. MANUAL SHALL BE ORGANIZED WITH APPROVED SHOP DRAWING FOLLOWED BY ALL RELATED OPERATION AND MAINTENANCE MATERIAL.

4. EQUIPMENT SHALL BE IDENTIFIED IN ACCORDANCE WITH THE DRAWING NOMENCLATURE AND INCLUDE SUPPLIER OF SAID EQUIPMENT.

5. Instructions shall be included for routine checking of all items requiring continued maintenance.

6. Schematic drawings with actual pieces of plumbing equipment, etc., shall be included; where manufacturer’s parts numbers only are applicable, they shall be included.

7. Detailed operating instructions for plumbing equipment shall be included, as well as general maintenance procedures to be followed on such equipment. Manufacturer’s maintenance and operation manuals will be required where such

are normally available with the equipment, but as such information is often of a general nature and applicable to various models of equipment, such information shall be supplemented by specified typed directions for the particular piece of equipment applicable to this project.

E. Materials, Equipment and Appliances

1. Materials: All materials, equipment, products and incidentals to be furnished by the Contractor shall be new, unless otherwise specified, undamaged and the first line quality product of the manufacturer and/or supplier, except when competitive grades fully meet the standards specified in the various technical sections of these specifications.

2. Standard Products: Except as otherwise approved by the Engineer, the equipment, and appliances to be furnished under these specifications shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. Where two or more units of the same type and class of equipment are required, the units shall be the product of the same manufacturer and shall be identical insofar as possible. The component parts of the products need not be products of one manufacturer.

3. Manufacturer's Directions: Where manufacturer's instructions or recommendations are applicable to the installation or application of materials, the Contractor shall adhere to strict conformance with such instructions or recommendations unless specifically noted to the contrary in these specifications. Where such directions conflict with the drawings and specifications, the Contractor shall inform the Engineer of such conflict and request instructions.

4. Samples: The Contractor shall furnish, for approval, samples of materials, profiles, designs, finishes, etc., which are either required by the various sections of specifications or which the Engineer may request from time to time. Samples shall be clearly identified with adequate information for the Engineer's evaluation.

5. Materials and Equipment Delivered to Jobsite: All items of materials, equipment, supplies and miscellaneous items to be incorporated into the work shall be delivered to the jobsite with labels, tags, nameplates and/or containers which clearly indicate the manufacturer's item or catalog number or conformance with the applicable standards stipulated in the technical sections of the specifications. Any item which cannot be verified in the field shall not be included in the work until its identity can be established by the Engineer.

F. Equipment and Material Substitutions

1. Should the Contractor elect to use and install materials which have been approved for use other than specified, he shall be required to make any necessary changes, perform all work and furnish any additional materials and ancillary equipment required to make such substituted materials or equipment function or perform as that specified, at no cost to the Owner. This includes structural, electrical and/or other affected trades.

1.29 DEFINITIONS

A. Plumbing Contractor: Any contractor whether bidding or working independently or under the supervision of a general contractor and/or construction manager and who installs any type of plumbing work.

B. Plumbing Sub-Contractor: Any contractor contracted to or employed by the plumbing contractor for any work required by the mechanical contractor.

C. Engineer: The consulting mechanical/electrical engineers either consulting to the owners, architects, other engineers, etc.

D. A-E: Shall construe architect and/or engineer. In all situations that involve an architect, it shall construe architect, in all others, engineer.

E. Furnish: Deliver to the site in good condition and turn over to contractor responsible for installation.

F. Provide: Furnish and install in complete working order.

G. Install: Install equipment furnished by others.

H. Indicated: Shown on the drawings or addenda thereto.

I. Contract Documents: All documents pertinent to the quality and quantity of work to be performed on the project. Includes but not limited to plans, specifications, instructions to bidders, general and special conditions, addenda, alternates, list of materials, list of sub-contractors, unit prices, shop drawings, field orders, change orders, cost breakdown, periodical payment requests, etc.

1.30 INTENT

A. It is the intention of these specifications and all associated drawings to call for finished work, tested and ready for operation. Wherever the word "provide" is used, it shall mean "furnish and install complete and ready for use".

B. Details not usually shown or specified, but necessary for the proper installation and operation of systems, equipment, materials, etc., shall be included in the work, the same as if herein specified or indicated.

1.31 DIGITAL DATA AND FILE TRANSMISSION

A. Sub-Contractors (SC) requiring digital files to prepare shop drawings and governmental agency submittals shall make their request through the Construction Manager (CM) or General Contractor (GC).

1. The CM/GC shall compile a list of requested drawings from the respective SC’s and submit one comprehensive list to STW.

2. STW will provide the CM/GC with a digital file transmission release form. The CM/GC may sign and return or have the requesting SC’s sign and return to STW through the CM/GC.

3. After receiving the signed release form, STW will provide one set of all requested digital files to the CM/GC to then distribute to the appropriate SC’s.

4. STW will provide AutoCAD/dwg files.

a. Revit/BIM models will not be provided to contractors. Projects completed using REVIT will be exported to AutoCAD prior to releasing.

B. The project architect is the owner/author of the floor plans and reflected ceiling plans.

1. The architect must approve the release of these plans before STW can release our respective drawings.

2. Requests for floor plans and/or reflected ceiling plans only shall be made directly to the architect.

END OF SECTION 22 01 00

SECTION 22 05 17 – SLEEVING, CUTTING, PATCHING AND REPAIRING FOR PLUMBING

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for the Plumbing Contractor related to sleeving, cutting, patching, and repairing associated with plumbing work.

1.2 WORK INCLUDED

A. Sleeves

B. Grout

C. Escutcheons

D. Lintels

1.3 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

PART 2 - PRODUCTS

2.1 SLEEVES

A. Cast-Iron Wall Pipes: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral water stop unless otherwise indicated.

B. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

C. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

D. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

E. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness, round tube closed with longitudinal joint.

2.2 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Nonshrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.3 ESCUTCHEONS

A. Escutcheons shall be Beaton and Caldwell; Carpenter and Patterson; Fee and Mason or approved equivalent. Chromium-plated iron or chromium-plated brass, either one piece or split patterns, held in place by internal spring tension or set screw that completely covers opening.

2.4 LINTELS

A. New openings under 48" in width: Provide one 3 1/2" x 3 1/2" x 3 1/2" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

B. New openings 48" to 96" in width: Provide one 3 1/2" x 6" x 3/8" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

C. New openings over 96" in width: Consult the project structural engineer.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for all openings, sleeves, trenches, etc., that he may require or create by demolition in floors, roofs, ceilings, walls, etc., and shall coordinate all such work with the General Contractor and all other trades. Coordinate with the General Contractor, any openings which he is to provide before submitting a bid proposal in order to avoid conflict and disagreement during construction. Improperly located openings shall be reworked at the expense of the Contractor.

B. The Contractor shall plan his work ahead and shall place sleeves, frames or forms through the walls, floors, and ceilings during the initial construction, where it is necessary for piping, ductwork, conduit, etc., to go throughout; however, when this is not done, the Contractor shall do all cutting and patching required for the installation of his work, or he shall pay other trades for doing this work when so directed by the Engineer. Any damage caused to the buildings by the workmen of the responsible Contractor must be corrected or rectified by him at his own expense.

C. The Contractor shall notify other trades in due time where he will require openings or chases in new concrete or masonry. He shall set all concrete inserts and sleeves for his work. Failing to do this, he shall cut openings for his work and patch same as required at his own expense.

D. The Contractor shall be responsible for properly shoring, bracing, supporting, etc., any existing and/or new construction to guard against cracking, settling, collapsing, displacing, or weakening while openings are being made. Any damage occurring to the existing and/or new structures, due to failure to exercise proper precautions or due to action of the elements shall be promptly and properly made good to the satisfaction of the Engineer.

E. All work improperly done or not done at all as required by the Mechanical Trades in this section, will be performed by the Contractor at the direction of the trade whose work is affected.

3.2 SLEEVES

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

1. Cut sleeves to length for mounting flush with both surfaces.

a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.

1. Cut sleeves to length for mounting flush with both surfaces.

2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.

3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

F. Pipes Passing Through Waterproofing Membranes: Pipes passing through floor waterproofing membrane shall be installed through a 4-pound lead-flashing sleeve, or a 0.032-inch thick aluminum sleeve, each with an integral skirt or flange. Flashing sleeve shall be suitably formed, and the skirt of flange shall extend not less than 8 inches from the pipe and shall set over the floor membrane in a troweled coating of bituminous cement. The flashing sleeve shall extend up the pipe a minimum of 1 inch above the floor. The annular space between the flashing sleeve and the metal-jacket-covered insulation shall be sealed. At the Contractor's option, pipes passing through floor waterproofing membrane may be installed through a cast iron sleeve with caulking recess, anchor lugs, flashing clamp device, and a pressure ring with brass bolts. Waterproofing membrane shall be clamped into space and sealant shall be placed in the caulking recess.

G. Pipes Passing Through Roof: Pipes passing through the roof shall be installed where shown on the drawings. Any penetration in roof shall be approved by the Roofing Manufacturer.

3.3 ESCUTCHEONS

A. Escutcheons shall be provided at all finished surfaces where exposed piping, bare or insulated, passes through floors, walls, or ceilings. Escutcheons shall be fastened securely to pipe sleeves or to extensions of sleeves without any part of sleeves being visible. Where sleeves project slightly from floors, special deep-type escutcheons shall be used.

3.4 CUTTING

A. All trades shall coordinate all openings in masonry walls with the General Contractor, and, unless otherwise indicated on the Architectural drawings, shall provide lintels for all openings required for the plumbing work (piping, wall boxes, etc.).

B. No cutting is to be done at points or in a manner that will weaken the structure and unnecessary cutting must be avoided. If in doubt, contact the engineer.

C. Pipe openings in slabs and walls shall be cut with core drill. Hammer devices will not be permitted. Edges of trenches and large openings shall be scribe cut with a masonry saw.

D. Openings in metal building walls shall be made in strict accord with building suppliers recommendations.

3.5 PATCHING AND REPAIRING

A. Patching and repairing made necessary by work performed under this division shall be included as part of the work and shall be done by skilled mechanics of the trade or trades for work cut or damaged, in strict accordance with the provisions herein before specified for work of like type to match adjacent surfaces and in a manner acceptable to the engineer.

B. Where portions of existing lawns, shrubs, paving, etc. are disturbed for installation or work of this Division, such items shall be repaired and/or replaced to the satisfaction of the engineer.

C. Where the installation or removal of piping, etc. requires or creates the penetration of fire or smoked rated walls, ceilings or floors, the space around such pipe, etc., shall be tightly filled with an approved non-combustible fire insulating material satisfactory to maintain the rating integrity of the wall, floor or ceilings affected.

D. Piping passing through floors, ceilings, and walls in finished areas, unless otherwise specified, shall be fitted with chrome plated brass escutcheons of sufficient outside diameter to amply cover the sleeved openings and an inside diameter to closely fit the pipe around which it is installed.

E. Where pipes pass through exterior walls, the wall openings shall be sealed air and watertight. This shall include sealing on both sides of the wall to insure air and water does not enter or exit the wall cavity. This is especially critical on exterior walls where the wall cavity may be vented to the exterior.

END OF SECTION 22 05 17

SECTION 22 05 29 – HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Pipe and Equipment Hangers, Supports, and Associated Anchors

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 220719 – PLUMBING PIPING INSULATION

D. Section 221000 - PLUMBING PIPING AND VALVES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product.

2. Show fabrication and installation details.

1.4 REFERENCES

A. ANSI/ASME B31.1 - Power Piping

1.5 SCOPE

A. This specification shall apply for the design and fabrication of all hangers, supports, anchors and guides. Where piping design is such that exceptions to this specification are necessary, the particular system shall be identified, and the exceptions approved by Engineer prior to installation. See drawings.

1.6 STRUCTURE

A. This section is intended to cover the structural requirements of the piping and equipment. It is not intended to imply that the building structure will support the loads imposed. The contractor shall review the structural drawings for where loads can be applied, what load can be supported and what structural reinforcing is required. Specific questions can be directed to the structural engineer.

1.7 DESIGN

A. All supports and parts shall conform to the latest requirements of the ANSI Code for Pressure Piping B31.1.0, and MSS Standard Practice SP-58, SP-69, and SP-89 except as supplemented or modified by the requirements of this specification.

B. Designs generally accepted as exemplifying good engineering practice, using stock or production parts, shall be utilized wherever possible.

C. Accurate weight balance calculations shall be made to determine the required supporting force at each hanger location and the pipe weight load at each equipment connection.

D. Pipe hangers shall be capable of supporting the pipe in all conditions of operation. They shall allow free expansion and contraction of the piping and prevent excessive stress resulting from transferred weight being induced into the pipe or connected equipment.

E. Where possible, steel structural attachments shall be beam clamps. Other attachments shall be as scheduled.

F. All rigid hangers shall provide a means of vertical adjustment after erection.

G. Hanger rods shall be subject to tensile loading only. At hanger locations where lateral or axial movement is anticipated, suitable linkage shall be provided to permit swing.

H. Where horizontal piping movements are greater than ½ inch, or where the hanger load angularity from the vertical is greater than 4 degrees from the cold to hot position of the pipe, the hanger rod to structural attachment shall be by use of Anvil Fig. 47 and Fig. 299 or the hanger rod and structural attachments shall be offset in such manner that the rod is vertical in the hot position.

I. Contractor to fabricate and provide additional structural support as required to prevent sway where hanger rod lengths exceed 48” in length.

J. Hangers shall be designed so that they cannot become disengaged by movements of the supported pipe.

K. All piping and equipment shall be braced and secured to prevent sway and movement in all axes.

L. Hangers shall be spaced in accordance with ANSI B31.1.0

M. Where practical, riser piping shall be supported independently of the connected horizontal piping.

1. Pipe support attachments to the riser piping shall be riser clamp lugs. Welded attachments shall be of material comparable to that of the pipe and designed in accordance with ANSI B31.1 codes.

N. Supports, guides and anchors shall be so designed that excessive heat will not be transmitted to the building steel. The temperature of support parts shall be based on a temperature gradient of 100 degrees F per inch distance from the outside surface of the pipe.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Anvil, B-Line, Elcen, Mason Industries, Advanced Thermal, Fee & Mason, Piping Specialties, MIRO Industries.

2.2 SHIELDS

A. Insulation-Insert Material for Cold Piping: ASTM C552, Type II cellular glass with 100-psi minimum compressive strength and vapor barrier.

B. Insulation-Insert Material for Hot Piping: Water-repellent-treated, ASTM C533, Type I calcium silicate with 100-psi minimum compressive strength.

C. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

D. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

E. Insert Length: Extend 2 inches beyond sheet metal shield for piping operating below ambient air temperature.

F. Shields for Copper Pipe shall utilize sheet lead.

2.3 INSERTS

A. Inserts: Malleable iron case or galvanized steel shell and expander plug for threaded connection with lateral adjustment, top slot for reinforcing rods, lugs for attaching to forms; size inserts to suit threaded hanger rods.

2.4 METAL PIPE HANGERS AND SUPPORTS

A. Carbon-Steel Pipe Hangers and Supports:

1. Description: MSS SP-58, Types 1 through 58, factory-fabricated components.

2. Galvanized Metallic Coatings: Pre-galvanized, hot dip galvanized, or electro-galvanized.

3. Nonmetallic Coatings: Plastic coated, or epoxy powder coated.

4. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion to support bearing surface of piping.

5. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel.

B. Copper Pipe and Tube Hangers:

1. Description: MSS SP-58, Types 1 through 58, copper-plated steel, factory-fabricated components.

2. Hanger Rods: Continuous-thread rod, nuts, and washer made of copper-plated steel.

2.5 TRAPEZE PIPE HANGERS

A. Description: MSS SP-58, Type 59, shop- or field-fabricated pipe-support assembly made from structural carbon-steel shapes with MSS SP-58 carbon-steel hanger rods, nuts, saddles, and U-bolts.

2.6 BEAM CLAMPS

1. Beam clamps shall have malleable iron jaws, steel bolt or tie rod, nuts, and jamb nuts.

2. C-clamps will not be permitted unless retainer is provided.

2.7 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports located in crawl spaces, pipe shafts, and suspended ceiling spaces are not considered exposed.

PART 3 - EXECUTION

3.1 INSERTS

A. Provide inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.

B. Where concrete slabs form finished ceiling, provide inserts to be flush with slab surface.

3.2 PIPE HANGERS AND SUPPORTS

A. Comply with MSS SP-58 for pipe-hanger selections and applications.

B. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finish.

C. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

D. Use carbon-steel pipe hangers and supports and metal framing systems and attachments for general service applications.

E. Use copper-plated pipe hangers and copper attachments for copper piping and tubing.

F. Use thermal-hanger shield inserts for insulated piping and tubing.

G. Install hangers to provide minimum ½ inch space between finished covering and adjacent work.

H. Place a hanger within 12 inches of each horizontal elbow.

I. Provide hangers with 1-1/2-inch minimum vertical adjustment.

J. Provide additional structural support where required to prevent pipe movement and sway.

K. Support riser piping independently of connected horizontal piping.

L. Support piping as follows:

Nominal Pipe Size	Single Rod Diameter	Thickness of Insulation Shield	Maximum Spacing Ferrous Piping	Copper Tubing	HDPE Piping
3/4" & Under	3/8"	16 gauge	6'	5'	2.5'
1"	3/8"	16 gauge	7'	6'	3'
1 1/4	3/8"	16 gauge	8'	8'	4'
1 ½"&2"	3/8"	16 gauge	9'	8'	4'
2 ½"&3"	½"	12 gauge	12'	8'	4'
4" & 5"	5/8"	12 gauge	14'	8'	4'
6"	3/4"	10 gauge	14'	8'	4'
8"	7/8"	8 gauge	14'	10'	5'

END OF SECTION 22 05 29

SECTION 22 05 53 – IDENTIFICATION OF PLUMBING PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

A. Identification of products installed under Division 21 and 22 including:

1. Plastic Nameplates
2. Plastic Tags
3. Metal Tags
4. Stencils and Paint
5. Plastic Pipe Markers
6. Plastic Tape Pipe Markers

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.
2. Piping and Equipment Label Schedule: Include a listing of all piping and equipment to be labeled with the proposed content for each label.
3. Submit list of wording, symbols, letter size, and color coding for mechanical identification.
4. Submit valve chart and schedule, including valve tag number, location, function, and valve manufacturer's name and model number.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Valve Schedules for each piping system to include in operation and maintenance manual.

1.5 REFERENCES

A. ANSI/ASME A13.1 - Scheme for the Identification of Piping Systems.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Brady Corp., Craftmark Pipe Markers, Seton Identification Products.

2.2 Color: Unless specified otherwise, conform with ANSI/ASME A13.1.

2.3 Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.4 Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2-inch square.

2.5 Metal Tags: Brass or aluminum with stamped letters; tag size minimum 1-1/2-inch diameter with smooth edges.

2.6 Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
3/4" - 1-1/4”	8"	1/2"
1-1/2" - 2"	8"	3/4"
2-1/2" - 6"	12"	1-1/4"
8" - 10"	24"	2-1/2"
Over 10"	32"	3-1/2"

A. Stencil Paint: Semi-gloss enamel black unless otherwise indicated.

2.7 Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed.

2.8 Plastic Tape Pipe Markers: Flexible, vinyl film tape with pressure sensitive adhesive backing and printed markings.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials and to accept stencil painting.

3.2 INSTALLATION

A. Plastic Nameplates: Install with corrosive-resistant mechanical fasteners, or adhesive.

B. Plastic or Metal Tags: Install with corrosive-resistant chain.

C. Stencil Painting: Apply in accordance with manufacturer's instructions.

D. Plastic Pipe Markers: Install in accordance with manufacturer's instructions.

E. Plastic Tape Pipe Markers: Install complete around pipe in accordance with manufacturer's instructions.

F. Equipment: Identify plumbing equipment such as but not limited to pumps, water heaters, storage tanks, expansion tanks, water treatment devices etc. with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic or metal tags.

G. Controls: Identify control panels and major control components outside panels with plastic nameplates.

H. Valves: Identify valves in main and branch piping with tags.

I. Piping: Identify piping, concealed, or exposed, with plastic pipe markers or plastic tape pipe markers. Stenciled painting may be used on insulation. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and "T", at each side of penetration of structure or enclosure, and at each obstruction.

3.3 VALVES AND CHARTS

A. The Contractor under this Division shall attach a numbered brass tag to each valve installed under this Contract. Each number shall be prefixed with the “P" for plumbing valves. Tags shall be attached to the valves by means of brass "S" hooks. Tags shall be Seton Name Plate Co., C.H. Hanson Co. or Identifications.

B. A chart headed ""PLUMBING VALVE CHART" shall be prepared. Three original charts shall be prepared and approved by the engineer. One of each approved type of chart shall be framed under glass and mounted on the wall in the main mechanical room where directed. Three photocopies of each chart shall be made and shall be submitted through normal shop drawing channels for approval and subsequent owner's files. Each chart shall be formatted as shown below: (All normally closed valves shall have a brass tag marked Normally Closed.)

PLUMBING VALVE CHART
PROJECT NAME
DATE

TAG NO.	VALVE LOCATION	VALVE TYPE/SIZE	VALVE FUNCTION

END OF SECTION 22 05 53

SECTION 22 06 00 – PLUMBING SYSTEMS DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training DVDs.

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

1.3 SUBMITTALS

A. Instruction Program: Submit copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module

1. At completion of training, submit training manual for Owner's use which includes receipts signed by the Owner acknowledging that training took place.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Demonstration and Training DVDs: Provide recording of all demonstrations and training given and submit DVD within ten days of end of each training module.

1. Identification: Provide an applied label with the following:
   a. Name of Project
   b. Name of Engineer
   c. Name of Contractor
   d. Date DVD was recorded
   e. Description of information recorded.
2. Transcript: Prepared on 8-1/2-by 11-inch paper, punched and bound in heavy-duty, three ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding DVD. Include name of Project and date of DVD on each page.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with operation and maintenance manual information.

PART 2 - PRODUCTS

2.1 DEMONSTRATION AND TRAINING PROGRAM

A. Provide program that includes individual training modules for each system and equipment not a part of a system as required by individual Specification Sections and as follows, but not limited to:

1. Plumbing: Provide demonstration and training by showing Owner personnel the major components of the plumbing system as follows:

a. Domestic water meter and location of meter

b. Domestic water entrance to building and all related components

c. Domestic hot water heaters and location of each

d. Sump pumps and location of each

e. All plumbing fixture types

f. Overview of sanitary sewer system layout and major components such as cleanouts, manholes, grease trap, plaster trap, etc.

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner personnel to adjust, operate, and maintain systems, subsystems, and equipment not a part of a system.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.

C. Schedule training with Owner, through Architect/Engineer, with at least ten days' advance notice.

3.3 DEMONSTRATION AND TRAINING DVDS

A. Engage a qualified individual to record demonstration and training DVDs. Record each training module separately. Include classroom instructions and demonstrations.

B. DVD Format: Provide high-quality DVD in full-size cassettes.

C. Narration: Describe scenes on DVD as DVD is recorded. Include description of items being viewed.

D. Transcript: Provide typewritten transcript of the narration.

END OF SECTION 22 06 00

SECTION 22 07 19 – PLUMBING PIPING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Piping Insulation

B. Jackets and Accessories

1.2 RELATED WORK

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 220553 - IDENTIFICATION OF PLUMBING PIPING AND EQUIPMENT

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.4 QUALITY ASSURANCE

A. Materials: Flame spread smoke developed rating of 25/50 in accordance with ASTM E84.

B. All pipe insulation shall be installed by mechanics specializing in this type of work. The finished product shall present a neat and workmanlike appearance. Insulation shall not be applied until all tests except operating tests have been completed, all foreign material, such as rust, scale, or dirt, has been removed and the surfaces are clean and dry. Insulation shall be clean and dry when installed and during the application of any finish.

C. The insulation, insulating materials and related items shall be delivered to the jobsite in the manufacturer's unopened containers. The containers shall have labels stating the manufacturer's name, contents, quantity, and other pertinent data.

PART 2- PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Insulations having the thermal and physical properties of the specific materials specified hereinafter, of any of the following manufacturers, or approved equal, are acceptable.

Armstrong	Knauf
Johns Mansville	Certain Teed/Saint Gobain
Owens Corning	Pittsburgh Corning
Rubatex	

B. The Engineer reserves the right to determine if the proposed insulating materials of any one manufacturer are acceptable in lieu of the specific insulation selected for the following applications.

2.2 INSULATION

A. Type A glass fiber insulation; ANSI/ASTM C547; 'k' value of 0.23 minimum at 75 degrees F; noncombustible.

B. Type B cellular foam; flexible, plastic; 'k' value of 0.25 minimum at 75 degrees F; ASTM C534. APArmaflex W (white) or APArmaflex SS (black) or equal.

C. Type C vinyl plastisol prefabricated assemblies with 1/8 minimum wall thickness. Trap wrap protective kit by Brocar, Plumberex, Truebro or approved equal.

2.3 JACKETS

A. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.

B. PVC Jackets: One piece, premolded type.

C. Canvas Jackets: UL listed treated cotton fabric, 6 oz/sq. yd.

2.4 ACCESSORIES

A. Insulation Bands: 3/4-inch-wide; 0.015-inch-thick galvanized steel, stainless steel. 0.007-inch 0.18 thick aluminum.

B. Metal Jacket Bands: 3/8-inch-wide; 0.015-inch-thick aluminum. 0.010-inch-thick stainless steel.

C. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.

D. Finishing Cement: ASTM C449.

E. Fibrous Glass Cloth: Unthreaded; 9 oz/sq. yd weight.

F. Adhesives: Compatible with insulation.

G. Treated wooden blocks.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install materials after piping has been tested and approved.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Continue insulation with vapor barrier through penetrations, except on fire rated walls.

C. In exposed piping, locate insulation and cover seams in least visible locations.

D. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.

E. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used. Insert shall extend around bottom 120 degrees of pipe barrel and shall be included inside vapor barrier jacket where applied. See Section 220529 for shields and hangers.

F. Neatly finish insulation at supports, protrusions, and interruptions.

G. Jackets

1. Indoor, Concealed Applications: Insulated pipes shall have standard jackets, with vapor barrier, factory-applied or field-applied. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass cloth and adhesive. PVC jackets may be used.

2. Indoor, Exposed Applications: For pipe exposed in mechanical equipment rooms or in finished spaces, insulate as for concealed applications. Finish with canvas jacket; size for finish painting. Do not use PVC jackets.

3. Flanges, Valves, Anchors and Fittings: Unless otherwise specified, all flanges, valves, anchors, and fittings shall be insulated with factory pre-molded or field fabricated segments of insulation of the same materials and thickness as the adjoining pipe insulation. When segments of insulation are used, elbows shall be provided with not less than three segments. For other fittings and valves, segments shall be cut to required curvatures, or nesting size sectional insulation shall be used. The segments of the insulation shall be properly placed and jointed with fire-resistant adhesive. After the insulation segments are firmly in place, fire-resistant vapor barrier coating shall be applied over the insulation in two coats with glass tape embedded between coats. The coating shall be applied to a total dry film thickness of 1/16 inch minimum. All glass tape seams shall be terminated neatly at the ends of the unions with insulating cement troweled on the bevel. For piping operating below ambient temperature, the beveled ends shall receive a coat of vapor barrier coating. Where anchors are used and secured directly to low temperature piping, they shall be insulated for a distance to prevent condensation, but not less than 6 inches from the surface of the pipe insulation. For jacket facing to receive finish painting, the factory applied jacket shall be as specified herein, except that the kraft paper shall be light colored with the kraft paper exposed. Field applied vapor barrier jacket shall conform to the above conditions where finish painting is required.

Piping	Type	Pipe Size (inch)	Thickness (inch)
Domestic Hot Water Supply/Recirculation	A/B	all	1
Domestic Cold-Water	A/B	all	1
Copper Water Piping Below Slab and Inside Walls	B	all	½
Chrome Plated Piping to Handicapped Lavatories	C	all	½
Chrome Plated Piping to Plumbing Fixtures		None	

END OF SECTION 22 07 19

SECTION 22 10 00 – PLUMBING PIPING AND VALVES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Pipe and Pipe Fittings

B. Valves

C. Sanitary Sewer Piping

D. Domestic Water Piping

E. Gas Piping

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 220200 – EXCAVATION AND BACKFILLING FOR UNDERGROUND PIPING

D. Section 220553 - IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

E. Section 220719 – PLUMBING PIPING INSULATION

F. Section 221119 – DOMESTIC WATER PLUMBING SPECIALTIES

G. Section 224200 - PLUMBING FIXTURES AND EQUIPMENT

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product.

1.4 QUALITY ASSURANCE

A. Valves: Manufacturer's name and pressure rating marked on valve body.

B. Welding Materials and Procedures: Conform to ASME Code.

C. Welders Certification: In accordance with ANSI/ASME Section 9.

D. Cast Iron Pipe: All cast iron pipe and fittings shall be marked with the collective trademark of the Cast Iron Soil Pipe Institute (CISPI) and shall be listed by NSF International.

E. Hubless Cast Iron Couplings: All couplings for hubless cast iron soil pipe and fittings shall conform to CISPI 310 and be certified by NSF International.

F. All drinking water system components that convey or dispense water for human consumption through drinking or cooking shall be “lead-free” in accordance with NSF/ANSI 61 and/or NSF/ANSI 372 standards and any and all state and local requirements.

PART 2 - PRODUCTS

2.1 SANITARY WASTE AND VENT PIPING, INTERIOR, ABOVE GRADE

A. Copper Tube and Fittings

1. Copper DWV Tube: ASTM B 306, drainage tube, drawn temper.

2. Copper Drainage Fittings: ASME B16.23, cast copper or ASME B16.29, wrought copper, solder-joint fittings.

3. Copper Flanges: ASME B16.24, Class 150, cast copper with solder-joint end.

4. Flange Bolts and Nuts: ASME B18.2.1, carbon steel unless otherwise indicated.

5. Solder: ASTM B 32, lead free with ASTM B 813, water-flushable flux.

B. PVC Pipe and Fittings (shall not be used within air plenums)

1. Solid-Wall PVC Pipe: ASTM D 2665, drain, waste, and vent.

2. Cellular-Core PVC Pipe: ASTM F 891, Schedule 40.

3. PVC Socket Fittings: ASTM D 2665, made to ASTM D 3311, drain, waste, and vent patterns and to fit Schedule 40 pipe.

4. Adhesive Primer: ASTM F 656.

5. Solvent Cement: ASTM D 2564.

2.2 WATER PIPING, INTERIOR

A. Copper Piping

1. Aboveground. Hard Copper Tube: ASTM B 88, Type L (ASTM B 88M, Type B) water tube, drawn temper; cast or wrought copper, solder-joint fittings; and brazed or soldered joints.

2. Cast-Copper, Solder-Joint Fittings: ASME B16.18, pressure fittings.

3. Wrought-Copper, Solder-Joint Fittings: ASME B16.22, wrought-copper pressure fittings.

4. Piping Joining Materials

a. Solder Filler Metals: ASTM B 32, lead-free alloys.

b. Flux: ASTM B 813, water flushable.

c. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.

2.3 NATURAL GAS PIPING, INTERIOR ABOVEGROUND

A. Steel Pipe: ASTM A 53/A 53M, black steel, Schedule 40, Type E or S, Grade B.

1. Malleable-Iron Threaded Fittings: ASME B16.3, Class 150, standard pattern.

2. Wrought-Steel Welding Fittings: ASTM A 234/A 234M for butt welding and socket welding.

3. Unions: ASME B16.39, Class 150, malleable iron with brass-to-iron seat, ground joint, and threaded ends.

B. Corrugated, Stainless-Steel Tubing: Comply with ANSI/IAS LC 1. Branch connections only.

1. Tubing: ASTM A 240/A 240M, corrugated, Series 300 stainless steel.

2. Coating: PE with flame retardant.

3. Fittings: Copper-alloy mechanical fittings with ends made to fit and listed for use with corrugated stainless-steel tubing and capable of metal-to-metal seal without gaskets. Include brazing socket or threaded ends complying with ASME B1.20.1.

4. Striker Plates: Steel, designed to protect tubing from penetrations.

5. Manifolds: Malleable iron or steel with factory-applied protective coating. Threaded connections shall comply with ASME B1.20.1 for pipe inlet and corrugated tubing outlets.

6. Operating-Pressure Rating: 5 psig.

2.4 DIELECTRIC FITTINGS

A. Dielectric Unions: ASSE 1079 Standard; 125 psig minimum pressure rating at 180 deg F; solder-joint copper alloy and threaded ferrous end connections.

B. Dielectric Nipples: IAPMO PS 66 Standard: electroplated steel nipple complying with ASTM F 1545; 300 psig pressure rating at 225 deg F; male threaded or grooved end connections; inert and noncorrosive, propylene lining.

2.5 ESCUTCHEONS

A. Escutcheons shall be Beaton and Caldwell; Carpenter and Patterson; Fee and Mason or approved equivalent. Chromium-plated iron or chromium-plated brass, either one piece or split patterns, held in place by internal spring tension or set screw that completely covers opening.

2.6 GATE VALVES

A. Class 125, RS, Bronze Gate Valves (up to 2 inches):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Crane, NIBCO, Stockham, Watts.

2. Description:

a. Standard: MSS SP-80, Type 2. CWP Rating: 150 psig. Body Material: Bronze with integral seat and screw-in bonnet. Ends: Threaded and soldered joint. Stem: Bronze. Disc: Solid wedge; bronze. Packing: Asbestos free. Handwheel: Malleable iron, bronze, or aluminum.

2.7 BALL VALVES

A. Two-Piece, Bronze Ball Valves (up to 2 inches):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Crane, NIBCO, Milwaukee, Stockham, Watts.

2. Description:

a. Standard: MSS SP-110. CWP Rating: 150 psig. Body Design: Two piece. Body Material: Bronze. Ends: Threaded and soldered. Seats: PTFE. Stem: Stainless steel. Ball: Stainless steel. Port: Full.

2.8 SWING CHECK VALVES

A. Class 125, Bronze Swing Check Valves with Bronze Disc (up to 2 inches):

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Crane, NIBCO, Stockham, Watts.

2. Description:

a. Standard: MSS SP-80, Type 3. CWP Rating: 150 psig. Body Design: Horizontal flow. Body Material: ASTM B 62, bronze. Ends: Threaded or soldered. Disc: Bronze.

2.9 SPRING LOADED CHECK VALVES

A. Class 125, Lift Check Valves with Nonmetalic Disc:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. Crane, NIBCO, Stockham, Watts.

2. Description:

a. Standard: MSS SP-80, Type 2. CWP Rating: 150 psig. Body Design: Vertical flow. Body Material: ASTM B 61 or ASTM B 62, bronze. Ends: Threaded or soldered. Disc: NBR, PTFE.

2.10 RELIEF VALVES

A. Bronze body, teflon seat, steel stem and springs, automatic, direct pressure actuated, capacities ASME certified and labeled.

B. Manufactured by Apollo, Consolidated, Kunkel, Watts and Zurn.

2.11 MANUAL GAS SHUT-OFF VALVES

A. Two-Piece, Full Port, Bronze Ball Valve with Bronze Trim: MSS SP-110 (up to 2 inches).

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. A.Y. McDonald Mfg., Brasscraft, Conbraco, Perfection Corp.

2. Description

a. Body: Bronze, complying with ASTM B 584. Ball: Chrome-plated brass. Stem: Bronze; blowout proof. Seats: Reinforced TFE; blowout proof. Packing: Threaded-body packnut design with adjustable-stem packing. Ends: Threaded, flared, or socket. CWP Rating: 600 psig. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

B. Bronze Plug Valves: MSS SP-78.

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:

a. A.Y. McDonald Mfg., Lee Brass Company

b. Description

2. Body: Bronze, complying with ASTM B 584. Plug: Bronze. Ends: Threaded or socket. Pressure Class: 125 psig. Listing: Valves NPS 1 and smaller shall be listed and labeled by an NRTL acceptable to authorities having jurisdiction. Service: Suitable for natural-gas service with "WOG" indicated on valve body.

2.12 GAUGE COCKS

A. Ashcroft No. 1092; 150 PSIG maximum working pressure; bronze; 1/4" screwed connections; tee handle.

B. All pressure gauges shall be installed with a gauge cock.

2.13 STRAINERS

A. Strainers shall be Y type equal to Leslie, Illinois, or Mueller. Sizes 2 1/2" and larger shall be flanged; sizes 2" and smaller shall be screwed.

B. Water strainers shall be cast iron or brass, designed for 125 lb. steam/200 lbs. WOG working pressure.

C. Strainers shall have a free area of strainer screen a minimum of twice the area of the adjoining pipe. Strainer baskets shall be fabricated from stainless steel or Monel sheet metal; baskets shall have 0.045" (3/64") perforations for water service.

PART 3 - EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs. Bevel plain end ferrous pipe.

B. Remove scale and dirt, on inside and outside, before assembly.

C. Prepare piping connections to equipment with flanges or unions.

3.2 INSTALLATION

A. Pipe shall be cut accurately to measurements established at the jobsite and worked into place without springing or forcing, properly clearing all windows, doors, and other openings.

B. Provide non-conducting dielectric connections wherever jointing dissimilar metals.

C. Route piping in orderly manner and maintain gradient.

D. Install piping to conserve building space and not interfere with use of space. Do not change the designed path of piping, add excessive turns or offsets, or change pipe sizes without first consulting the Engineer.

E. Group piping whenever practical at common elevations.

F. Install piping to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

G. Provide clearance for installation of insulation and access to valves and fittings.

H. Provide access where valves and fittings are not exposed.

I. Slope water piping and arrange to drain at low points.

J. Establish elevations of buried piping outside the building to ensure not less than 3 feet of cover.

K. Where pipe support members are welded to structural building framing, scrape, brush clean, and apply one coat of zinc rich primer to welding.

L. Prepare pipe, fittings, supports, and accessories not prefinished, ready for finish painting.

M. Establish invert elevations, slopes for drainage to be 1/8 inch per foot one percent minimum. Maintain gradients.

N. Install bell and spigot pipe with bell end upstream.

O. Install valves with stems upright or horizontal, not inverted.

P. Escutcheons shall be provided at all finished surfaces where exposed piping, bare or insulated, passes through floors, walls, or ceilings. Escutcheons shall be fastened securely to pipe sleeves or to extensions of sleeves without any part of sleeves being

visible. Where sleeves project slightly from floors, special deep-type escutcheons shall be used.

3.3 APPLICATION

A. Use grooved mechanical couplings and fasteners only in accessible locations.

B. Install unions downstream of valves and at equipment or apparatus connections.

C. Install brass male adapters each side of valves in copper pipe system. Sweat solder adapters to pipe.

D. Install ball and/or butterfly valves for shut-off and to isolate equipment, parts of systems, vertical risers and branch piping serving fixtures without a means of shut-off. Valves to be located in such a manner to be accessible for service personnel. Provide access panel(s) if required to access valves.

E. Install ball valves for throttling, bypass, or manual flow control services.

F. Provide spring loaded check valves on discharge of water pumps.

G. Do not install above grade piping in areas subject to freezing. Where such an area is encountered, notify the engineer for instruction.

3.4 DISINFECTION OF DOMESTIC WATER PIPING SYSTEM

A. Prior to starting work, verify system is complete, flushed, and clean.

B. Ensure PH of water to be treated is between 7.4 and 7.6 by adding alkali (caustic soda or soda ash) or acid (hydrochloric).

C. Inject disinfectant, free chlorine in liquid, powder, tablet, or gas form, throughout system to obtain 50 to 80 mg/L residual.

D. Bleed water from outlets to ensure distribution and test for disinfectant residual at minimum 15 percent of outlets.

E. Maintain disinfectant in system for 24 hours.

F. If final disinfectant residual test less than 25 mg/L, repeat treatment.

G. Flush disinfectant from system until residual equal to that of incoming water or 1.0 mg/L.

H. Take samples no sooner than 24 hours after flushing, from outlets and from water entry, and analyze in accordance with AWWA C601.

END OF SECTION 22 10 00

SECTION 22 14 29 – SUMP PUMPS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Submersible, Fixed-Position, Single –Seal Sump Pumps

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 221000 - PLUMBING PIPING AND VALVES

1.3 ACTION SUBMITTALS

A. Shop Drawings: For each pump.

1. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Include diagrams for power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For all pumps and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For pumps to include in operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Armstrong, Bell & Gossett, Ebara, Flo Fab, Gould, Little Giant, Peerless, Vertiflo, Weil, Weinman, and Zoeller.

2.2 GENERAL CHARACTERISTICS

A. Statically and dynamically balance rotating parts.

B. Pumps to operate at 1750 rpm maximum unless specified otherwise.

C. Provide all pumps 1/3 hp and larger with H.O.A. starters with 120V control transformer. See Section 220100 for details.

D. Integral phase failure relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Mechanical contractor shall coordinate staggered restart times as required.

2.3 SUBMERSIBLE, FIXED-POSITION, SINGLE SEAL SUMP PUMPS

A. Description: Factory-assembled and -tested sump-pump unit, (simplex or duplex arrangement as specified).

B. Pump Type: Submersible, end-suction, single-stage, close-coupled, overhung-impeller, centrifugal sump pump.

C. Pump Casing: Cast iron, with strainer inlet, legs that elevate pump to permit flow into impeller, and vertical discharge for piping connection.

D. Impeller: Statically and dynamically balanced, ASTM B 584, cast bronze, semi open design for clear wastewater handling, and keyed and secured to shaft.

E. Pump and Motor Shaft: Stainless steel or steel, with factory-sealed, grease-lubricated ball bearings.

F. Seal: Mechanical.

G. Motor: Hermetically sealed, capacitor-start type; with built-in overload protection; lifting eye or lug; and three-conductor, waterproof power cable of length required and with grounding plug and cable-sealing assembly for connection at pump.

H. Controls:

1. Enclosure: NEMA 250, pedestal or wall mounted.

2. Switch Type: Mechanical-float type, in NEMA 250, Type 6 enclosures with mounting rod and electric cables.

3. Automatic Alternator (for duplex arrangements): Start pumps on successive cycles and start multiple pumps if one cannot handle load.

4. High-Water Alarm: Rod-mounted, NEMA 250, Type 6 enclosure with mechanical-float, switch matching control and electric bell; 120-V ac, with transformer and contacts for remote alarm bell.

I. Control-Interface Features:

1. Remote Alarm Contacts: For remote alarm interface.

2. Building Automation System Interface: Auxiliary contacts in pump controls for interface to building automation system and capable of providing the following:

a. On-off status of pump.

b. Alarm status.

PART 3 - EXECUTION

3.1 PUMP INSTALLATION

A. Install pumps in a manner to provide access to motors, impellers, couplings, and accessories for periodic maintenance.

B. Pumps shall be independently supported as well as associated piping so that pump is not supported by piping and piping is not supported by pump.

3.2 CONNECTIONS

A. See drawings and other Division 22 specifications for installation requirements and arrangement of piping, fittings, and specialties.

B. Install all piping at pumps in a manner too allow for service and maintenance of pumps.

C. At piping connections to pumps, install valves the same size as piping.

1. For sump pumps, install check and shut-off valves on discharge piping.

3.3 DEMONSTRATION

A. Provide owner’s maintenance personnel training as required to adjust, operate, and maintain pumps.

END OF SECTION 22 14 29

SECTION 22 33 00 – ELECTRIC DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Electric, Storage, Domestic Water Heaters

B. Expansion Tank

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 221000 - PLUMBING PIPING AND VALVES

1.3 QUALITY ASSURANCE

A. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. National Sanitation Foundation (NSF)
2. American Society of Mechanical Engineers (ASME)
3. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI)
4. National Electrical Manufacturers' Association (NEMA)
5. Underwriters Laboratories (UL)

1.4 ACTION SUBMITTALS

A. Shop Drawings: For each product.

1. Product Data:

a. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For each type of product and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For each type of product and controls to include in operation, and maintenance manuals.

1.6 WARRANTY

A. Provide five (5) year warranty on all electric, storage domestic water heaters, controls, and other components.

B. Provide five (5) year warranty on all expansion tanks.

PART 2 - PRODUCTS

2.1 ELECTRIC, STORAGE, DOMESTIC WATER HEATER

A. Acceptable Manufacturers

1. State, A.O. Smith, Lochinvar, PVI, Coates, Rheem or Precision electric water heater of size as shown on drawings.

B. Standard: UL 1453. Storage Tank Construction: ASME-code (where required), steel vertical arrangement.

1. Tappings: Factory fabricated of materials compatible with tank and piping connections. Attach tappings to tank before testing.

a. NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.

b. NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges, and according to ASME B16.24 for copper and copper-alloy flanges.

2. Pressure Rating: 150 psig.

3. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining material into tappings.

C. Factory-Installed Storage Tank Appurtenances:

1. Anode Rod: Replaceable magnesium.

2. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.

3. Insulation: Comply with ASHRAE/IESNA 90.1.

4. Jacket: Steel with enameled finish.

5. Heating Elements: Electric, screw-in or bolt-on immersion type arranged in multiples of three.

6. Temperature Control: Adjustable thermostat.

7. Safety Controls: High-temperature-limit and low-water cutoff devices or systems.

8. Relief Valves: ASME rated and stamped for combination temperature-and-pressure relief valves. Include one or more relief valves with total relieving capacity at least as great as heat input and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.

D. Provide ASME rating on all water heaters with an input rating of 200,000 Btuh and above.

E. See schedule on drawing.

2.2 DIAPHRAGM - TYPE EXPANSION TANKS

A. Acceptable Manufacturers

1. Amtrol, State or Watts for potable water.

B. Description

1. Steel pressure-rated tank constructed with welded joints and factory-installed butyl-rubber diaphragm. Include air precharge to minimum system-operating pressure at tank.

C. Construction:

1. Tappings: Factory-fabricated steel, welded to tank before testing and labeling. Include ASME B1.20.1 pipe thread.

2. Interior Finish: Comply with NSF 61 Annex barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.

3. Air-Charging Valve: Factory installed.

PART 3 - EXECUTION

3.1 DOMESTIC WATER HEATER INSTALLATION

A. Install water heaters in accordance with manufacturer’s instructions and to all relevant NFPA, ASME and NSP requirements.

B. Electric, Storage Domestic-Water Heater Mounting: Install domestic-water heaters on concrete base. Comply with requirements for concrete base.

1. Exception: Omit concrete bases for commercial domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.

2. Maintain manufacturer's recommended clearances.

3. Arrange units so controls and devices that require servicing are accessible.

4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.

5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

7. Install anchor bolts to elevations required for proper attachment to supported equipment.

8. Anchor domestic-water heaters to substrate.

C. Install domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping.

D. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

E. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains.

F. Install thermometer on outlet piping of domestic-water heaters.

G. Assemble and install inlet and outlet piping manifold kits for multiple domestic-water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each domestic-water heater. Include shutoff valve and thermometer in each domestic-water heater inlet and outlet and throttling valve in each domestic-water heater outlet.

END OF SECTION 22 33 00

SECTION 22 34 00 – FUEL FIRED DOMESTIC WATER HEATERS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Gas-Fired, High Efficiency, Storage, Domestic Water Heaters

B. Expansion Tank

C. Venting

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 221000 - PLUMBING PIPING AND VALVES

1.3 QUALITY ASSURANCE

A. Ensure products and installation of specified products are in conformance with recommendations and requirements of the following organizations:

1. National Sanitation Foundation (NSF).
2. American Society of Mechanical Engineers (ASME).
3. National Board of Boiler and Pressure Vessel Inspectors (NBBPVI).
4. National Electrical Manufacturers' Association (NEMA).
5. Underwriters Laboratories (UL).
6. American Gas Association (AGA)
7. National Fire Protection Association (NFPA)

1.4 ACTION SUBMITTALS

A. Shop Drawings: For each product.

1. Product Data:

a. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Include diagrams for power, signal, and control wiring.

1.5 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For each type of product and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For each type of product and controls to include in operation, and maintenance manuals.

1.6 WARRANTY

A. Provide five (5) year warranty on all fuel fired, storage domestic water heaters, controls, and other components.

B. Provide five (5) year warranty on all fuel fired, tankless domestic water heaters.

C. Provide five (5) year warranty on all stand-alone storage tanks.

D. Provide five (5) year warranty on all expansion tanks.

PART 2 - PRODUCTS

2.1 GAS-FIRED, HIGH-EFFICIENCY, STORAGE DOMESTIC WATER HEATER

A. Acceptable Manufacturers

1. State, A.O. Smith, Rheem, PVI, or Lochinvar, gas water heater of size as shown on drawings.

B. Standard: ANSI Z21.10.3/CSA 4.3. Manufacturer's proprietary design to provide at least 95 percent minimum combustion efficiency at optimum operating conditions.

C. Storage-Tank Construction: ASME-code steel with 150-psig minimum working pressure rating.

1. Tappings: Factory fabricated of materials compatible with tank. Attach tappings to tank before testing.

a. NPS 2 and Smaller: Threaded ends according to ASME B1.20.1.

b. NPS 2-1/2 and Larger: Flanged ends according to ASME B16.5 for steel and stainless-steel flanges and according to ASME B16.24 for copper and copper-alloy flanges.

2. Interior Finish: Comply with NSF 61 Annex G barrier materials for potable-water tank linings, including extending finish into and through tank fittings and outlets.

3. Lining: Glass lined complying with NSF 61 Annex G barrier materials for potable-water tank linings, including extending lining into and through tank fittings and outlets.

D. Factory-Installed Storage-Tank Appurtenances:

1. Anode Rod: Replaceable magnesium.

2. Dip Tube: Required unless cold-water inlet is near bottom of tank.

3. Drain Valve: Corrosion-resistant metal complying with ASSE 1005.

4. Insulation: Comply with ASHRAE/IESNA 90.1. Surround entire storage tank except connections and controls.

5. Jacket: Steel with enameled finish.

6. Burner or Heat Exchanger: Comply with UL 795 or approved testing agency requirements for gas-fired, high-efficiency, domestic-water heaters, and natural-gas fuel.

7. Temperature Control: Adjustable thermostat.

8. Safety Controls: Automatic, high-temperature-limit and low-water cutoff devices or systems.

9. Combination Temperature-and-Pressure Relief Valves: ANSI Z21.22/CSA 4.4-M. Include one or more relief valves with total relieving capacity at least as great as heat input, and include pressure setting less than domestic-water heater working-pressure rating. Select one relief valve with sensing element that extends into storage tank.

E. Provide ASME rating on all water heaters with an input rating of 200,000 Btuh and above.

2.2 DIAPHRAGM - TYPE EXPANSION TANKS

A. Acceptable Manufacturers

1. Amtrol, State or Watts for potable water.

B. Construction: Welded steel, tested and stamped in accordance with Section 8D of ANSI/ASME Code; supplied with National Board Form U-1, rated for working pressure of 125 psig, with flexible EPDM diaphragm sealed into tank, and steel legs or saddles.

PART 3 - EXECUTION

3.1 DOMESTIC WATER HEATER INSTALLATION

A. Install water heaters in accordance with manufacturer’s instructions and to all relevant NFPA, ASME and NSP requirements.

B. Storage Domestic Water Heater Mounting: Install domestic-water heaters on concrete base. Comply with requirements for concrete base.

1. Exception: Omit concrete bases for commercial domestic-water heaters if installation on stand, bracket, suspended platform, or directly on floor is indicated.

2. Maintain manufacturer's recommended clearances.

3. Arrange units so controls and devices that require servicing are accessible.

4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18-inch centers around the full perimeter of concrete base.

5. For supported equipment, install epoxy-coated anchor bolts that extend through concrete base and anchor into structural concrete floor.

6. Place and secure anchorage devices. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

7. Install anchor bolts to elevations required for proper attachment to supported equipment.

8. Anchor domestic-water heaters to substrate.

C. Install domestic-water heaters level and plumb, according to layout drawings, original design, and referenced standards. Maintain manufacturer's recommended clearances. Arrange units so controls and devices needing service are accessible.

1. Install shutoff valves on domestic-water-supply piping to domestic-water heaters and on domestic-hot-water outlet piping.

D. Install gas-fired, domestic-water heaters according to NFPA 54.

1. Install gas shutoff valves on gas supply piping to gas-fired, domestic-water heaters without shutoff valves.

2. Install gas pressure regulators on gas supplies to gas-fired, domestic-water heaters without gas pressure regulators if gas pressure regulators are required to reduce gas pressure at burner.

3. Install automatic gas valves on gas supplies to gas-fired, domestic-water heaters if required for operation of safety control.

E. Install combination temperature-and-pressure relief valves in top portion of storage tanks. Use relief valves with sensing elements that extend into tanks. Extend water-heater relief-valve outlet, with drain piping same as domestic-water piping in continuous downward pitch, and discharge by positive air gap onto closest floor drain.

F. Install water-heater drain piping as indirect waste to spill by positive air gap into open drains or over floor drains.

G. Install thermometer on outlet piping of domestic-water heaters.

H. Assemble and install inlet and outlet piping manifold kits for multiple domestic-water heaters. Fabricate, modify, or arrange manifolds for balanced water flow through each domestic-water heater. Include shutoff valve and thermometer in each domestic-water heater inlet and outlet and throttling valve in each domestic-water heater outlet.

END OF SECTION 22 34 00

SECTION 22 42 00 – PLUMBING FIXTURES AND EQUIPMENT

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Water Closets

B. Lavatories

C. Stainless Steel Sinks

D. Bathtubs

E. Tub/Shower Trim

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISIONS FOR PLUMBING WORK

C. Section 211000 - PLUMBING PIPING AND VALVES

1.3 ACTION SUBMITTALS

A. Shop Drawings: For each fixture.

1. Product Data: For each type of product.

a. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.

b. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

2. Include diagrams for power, signal, and control wiring where applicable.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For each type of product and related components requiring maintenance. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: Provide in operation and maintenance manual the following when provided:

1. Flushometer valves and electronic sensors.

2. Lavatory, sink and shower faucets.

3. Electric water coolers.

1.5 GENERAL REQUIREMENTS

A. All plumbing fixtures and their installation shall conform to the requirements of the Kentucky State Plumbing Code.

B. Exposed metal work shall be bright chrome-plated brass except as noted.

C. All fixtures shall be by the same manufacturer.

D. All ADA accessible water closets provided with manual flush valve/trip lever shall have the flush valve handle/trip lever mounted on the wide(open) side of the water closet.

E. All drinking water system components that convey or dispense water for human consumption through drinking or cooking shall be “lead-free” in accordance with NSF/ANSI 61 and/or NSF/ANSI 372 standards and all state and local requirements.

F. Provide all plumbing fixtures complete with trim required and connect in a manner conforming to the state and local plumbing codes. Certain fixtures will be furnished by others under other sections of these Specifications. Provide rough-in and final connections including all valves, traps, specialties, etc. required.

G. Provide traps for all waste connections where not furnished with the fixture and or equipment; unions; and stops or shut-off valves for all water connections to all sinks and other items of equipment as required. All exposed pipe and metal, including that within cabinets, shall be chrome plated brass.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Acorn, Ancorn Aqua, American Standard, Bemis, Bradley, Briggs/Proflo, Chicago, Clarion Bathware, Church, Component Hardware, Crane, Delany, Delta, Eljer, Elkay, Encon, Fiat, Florestone, Guardian, Haws, Intersan, Jay R. Smith, Just, Kohler, Lawler, Leonard, Metcraft, Moen, Murdock, Mustee, Oasis, Olsonite, Powers, Sioux Chief, Sloan, Speakman, Stearn-Williams, Stingray Systems, Symmons, T&S Brass, Toto, Willoughby, Wade, Watersaver, Watts and Zurn. SEE SCHEDULES ON DRAWINGS.

B. Products listed in schedule on drawings shall determine quality and grade required. If other than those listed in schedule are to be used, equivalent or parallel grade shall be used.

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 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, back-outlet water closets with fittings and gasket seals.

D. Install wall-hanging, back-outlet water closets with support manufacturer's tiling frame or setting gage.

E. Install toilet seats on water closets.

F. Install wall-hanging, back-outlet urinals with gasket seals.

G. Install flush 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.

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 recessed, wall-mounted fittings to reinforcement built into walls.

J. Fasten wall-mounted fittings to reinforcement built into walls.

K. Fasten counter-mounting plumbing fixtures to casework.

L. Secure supplies to supports or substrate within pipe space behind fixture.

M. Set shower receptors and mop basins in leveling bed of cement grout as specified by Architect.

N. Install individual stop valve in each water supply to fixture. Use gate or globe valve where specific stop valve is not specified.

O. 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 shower, flow-control fittings with specified maximum flow rates in shower arms.

T. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes, except where otherwise indicated.

U. Install disposers in sink outlets. Install switch where indicated, or in wall adjacent to sink if location is not indicated.

V. 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.

W. Seal joints between fixtures and walls, floors, and counters using sanitary-type, 1-part, mildew-resistant, silicone sealant. Coordinate this requirement with Architectural trades.

3.3 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:

B. Install piping connections between plumbing fixtures and piping systems and plumbing equipment specified in other Division 22 Sections.

C. Supply and Waste Connections to Plumbing Fixtures: Refer to plumbing fixture schedules for fitting sizes and connection requirements for each plumbing fixture.

D. 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.

E. Arrange for electric-power connections to fixtures and devices that require power. Electric power is specified in Division 26 Sections and individual equipment sections.

3.4 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.

3.5 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.

3.6 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 42 00

MECHANICAL INDEX

SECTION NUMBER
DIVISION 23 – HEATING, VENTILATING AND AIR CONDITIONING

SECTION 23 01 00 – GENERAL PROVISIONS FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section covers the general arrangement of the mechanical systems and related items to complete the work as shown on the drawings and as specified herein.

B. The General and Special Conditions and all other Contract Documents are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

C. The Contractor shall familiarize himself with the work of all other trades, general type construction and the relationship of his work to other sections. He shall examine all working drawings, specifications and conditions affecting his work. The Contractor shall visit the premises and thoroughly familiarize himself with all details of the work and working conditions, verify all dimensions in the field and advise the Engineer of any discrepancy before performing any work.

D. The work shall include complete testing of all equipment and piping at the completion of the work and making any minor connection changes or adjustments necessary for the proper functioning of the system and equipment.

E. The Contractor shall perform all necessary temporary work during construction.

F. Work under this section shall conform to all governing codes, ordinances and regulations of the City, County and State.

G. The Contractor shall be responsible for all errors in fabrication, for the correct fitting, installation and erection of the various mechanical systems as shown on the drawings.

H. Any materials, labor, equipment, or services not mentioned specifically herein which may be necessary to complete any part of the MEP/FP systems in a substantial manner and in compliance with the requirements stated, implied, or intended in the Plans and/or Specifications, shall be included in the Bid as part of this Contract.

I. The Contractor shall hold harmless and indemnify the Engineer, Architect, employees, officers, agents and consultants from all claims, loss, damage, actions, causes of actions, expense and/or liability resulting from, brought for, or on account of any personal injury or property damage received or sustained by any person, persons, (including third parties), or any property growing out of, occurring, or attributable to any work performed under or related to this contract, resulting in whole or in part from the negligence of the Contractor, any Sub-Contractor, any employee, agent or representative.

1.2 SCOPE

A. This branch of the work includes coordination with all utility companies; agency review fees and all inspection fees; all labor, materials, tools, excavation and backfill and all equipment necessary for the installation of all Heating, Ventilating and Air Conditioning, System as shown on the Drawings and Specifications and/or as required for complete and operating systems. The work shall include starting, balancing, and the necessary and required tests to insure the proper operation of the complete system.

B. All work for this project must comply and be in strict accordance with the Kentucky Building Code, Kentucky Plumbing Code, Kentucky Boiler Code, NFPA, ADA, NEC and all local codes and regulations.

C. In general (as a minimum) all materials and equipment must be installed in strict accordance with manufacturer's requirements; and provided with all required controls, internal fusing, relays, piping connections, electrical connections, ductwork connections, etc., to provide for complete and operable systems.

D. The Architect and Engineer do not define the scope of individual trades, Sub-Contractors, material suppliers and vendors. Any sheet numbering system or specification numbering system used which identifies disciplines is solely for the Architect and Engineer's convenience and is not intended to define a Sub-Contractor's scope of work. Information regarding individual trades, Sub-Contractors, material suppliers and vendors may be detailed, described, and indicated at different locations throughout the Contract Documents. No consideration will be given to requests for change orders for failure to obtain and review the complete set of Contract Documents when preparing Bids, prices, and quotations. Unless stated otherwise, the subdivision and assignment of work under the various sections shall be the responsibility of the Contractor holding the prime contract.

E. It is the responsibility of the bidder to completely review the Contract Documents. Any interpretation as to design intent or scope shall be provided by the Engineer / Architect. Should an interpretation be required, the bidder shall request a clarification not less than ten (10) days prior to the submission of the proposal so that the condition may be clarified by Addendum. In the event of any conflict, discrepancy, or inconsistency develops; the interpretation of the Engineer shall be final.

F. The Contractor shall give written notice of any materials or apparatus believed inadequate or unsuitable; in violation of laws, ordinances, codes, rules, or regulations of authorities having jurisdiction; and any necessary items of work omitted a minimum of ten (10) days prior to bid. In the absence of such written notice and by the act of submitting a bid, it shall be understood that the Contractor has included the cost of all required items in the bid, and that will be responsible for the approved satisfactory functioning of the entire system without extra compensations.

1.3 DEFINITIONS AND ABBREVIATIONS

A. A-E: Shall construe architect and/or engineer. In all situations that involve an architect, it shall construe architect, in all others, engineer.

B. Bidder - Any person, agency or entity submitting a proposal to any person, agency, or entity for any part of the work required under this contract.

C. Contract Documents: All documents pertinent to the quality and quantity of work to be performed on the project. Includes but not limited to plans, specifications, instructions to bidders, general and special conditions, addenda, alternates, list of materials, list of sub-Contractors, unit prices, shop drawings, field orders, change orders, cost breakdown, periodical payment requests, etc.

D. Engineer: The consulting mechanical/electrical engineers either consulting to the owners, architects, other engineers, etc.

E. Furnish: Deliver to the site in good condition and turn over to Contractor responsible for installation.

F. Install: Install equipment furnished by others.

G. Indicated: Shown on the drawings or addenda thereto.

H. Mechanical Contractor: Any Contractor whether bidding or working independently or under the supervision of a general Contractor and/or construction manager and who installs any type of mechanical work.

I. Mechanical Sub-Contractor: Any Contractor contracted to or employed by the mechanical Contractor for any work required by the mechanical Contractor.

J. Prime Contractor: The General Contractor (GC) or Construction Manager (CM).

K. Project - All of the work required under this Contract.

L. Provide: Furnish and install in complete, tested and in working order.

M. Typical (TYP)- Where indicated repeat this work, method or means each time the same or similar condition occurs whether indicated or not.

N. ADA - Americans with Disabilities Act

O. AGA - American Gas Association

P. AMCA - Air Moving and Conditioning Association

Q. ANSI - American National Standards Institute

R. ARI - Air Conditioning & Refrigeration Institute

S. ASME - American Society of Mechanical Engineers

T. ASHRAE - American Society of Heating, Refrigerating and Air Conditioning Engineers

U. ASTM - American Society of Testing Materials

V. AWWA - American Water Works Association

W. AWS - American Welding Society

X. BOCA - Building Officials & Code Administrators International, Inc.

Y. CM – Construction Manager

Z. DOE - U.S. Department of Energy

AA. EPA - Environmental Protection Agency

BB. FM – Factory Mutual

CC. GC – General Contractor

DD. HBC - Housing, Building and Construction

EE. IBC - International Building Code

FF. IECC - International Energy Conservation Code

GG. IMC - International Mechanical Code

HH. MEP/FP – Mechanical, Electrical, Plumbing / Fire Protection

II. NFPA - National Fire Protection Association

JJ. NEC - National Electrical Code

KK. NEMA -National Electrical Manufacturer's Association

LL. OSHA - Occupational Safety and Health Administration

MM. SC - Sub-Contractor

NN. SMACNA - Sheet Metal and Air Conditioning Contractors National Association

OO. STW – Shrout Tate Wilson Consulting Engineers

PP. UL - Underwriter's Laboratories, Inc.

1.4 QUALIFICATIONS

A. All Mechanical Contractors and their Sub-Contractors bidding this project must have been a licensed company for a minimum of three (3) years. Experience of any one individual employee does not supersede this requirement.

B. All mechanical Sub-Contractors bidding the mechanical work must have completed one project of 75% this subcontract cost size and two projects of 50% this subcontract cost size.

C. All mechanical work shall be performed by qualified workers who are competent in the area of work for which they are responsible. Any workers not meeting this requirement, as evidenced by their workmanship, shall be summarily relieved of their responsibilities. The Engineer shall reserve the right to determine the quality of workmanship of any workers and unqualified or incompetent workers shall refrain from work in areas not deemed satisfactory. Requests for relief of workers shall be made through the normal channels of Architect, Contractor, etc.

D. The Contractor shall be licensed in the State which the work is to be performed. All work shall be performed by licensed Master HVAC Contractors and Master / Journeymen Plumbers.

E. All control systems shall be installed by workers normally engaged or employed in this type of work.

F. Specialized systems such as medical gases, automatic sprinkler systems, etc. shall be installed only by workers who are licensed and normally engaged in such services.

G. All electrical work shall be accomplished by Licensed Journeymen electricians under the direct supervision of a licensed Electrician. All applicable codes, utility company regulations, laws and permitting authority of the locality shall be fully complied with by the Contractor.

1.5 PERMITS, FEES, CODES AND APPROVALS

A. Permits and Fees

1. All permits, tap on fees and agency review and inspection fees necessary for the complete HVAC, system shall be obtained by the Contractor from the authorities governing such work. The cost of all permits shall be borne by the Contractor.

B. Codes

1. The minimum standard for all mechanical work shall be the current requirements of the Kentucky State Plumbing Law, Regulation and Code, Kentucky Building Code, ADA, International Mechanical Code, Kentucky Boiler Code, NFPA and local ordinances.

C. Approvals

1. All work must be approved by the Architect/Engineer, Owner and all related Code Agencies before final payment will be made.

2. As a minimum, the following approval Certificates of Inspection and Approval shall be required:

a. HVAC Inspection

b. Local and State Building Inspections.

3. Final payment will be contingent upon all Approval Certificates.

1.6 DRAWINGS AND SPECIFICATIONS

A. Contract drawings for work under this section are in part diagrammatic, intended to convey the scope of work and indicate the general arrangement of equipment, piping and the approximate size and location of equipment and outlets. The Contractor shall follow these drawings in laying out his work and shall verify spaces in which his work will be installed, indicating to the Engineer where any conflicts or overlapping of systems occur. Any item of work not clearly included, specified and/or shown, errors or conflict between Plans (Mechanical, Architectural, Structural or Electrical), Specifications, codes and field conditions, shall be clarified by a written request to the Architect by the Bidder before bidding; otherwise, the bidder shall, at his own expense, supply the proper labor and

materials to include these items of work and to make good any damages or defects in his work caused by such error, omission or conflict. Under no circumstances shall a Contractor scale the Drawings for the location of equipment and work.

B. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

C. Should conflict, overlap or duplication of work between the various trades become evident, this shall be called to the attention of the Engineer. Neither trade shall assume to be relieved of the work which is specified under their branch until instructions in writing are received from the Engineer.

D. Where job conditions require reasonable changes in indicated locations and arrangement, proposed departures shall be submitted with detailed drawings to the Engineer for approval before any of the proposed work is commenced. All approved departures shall be made at no additional cost to the Owner.

E. The drawings and the specifications are intended to indicate complete and working systems, unless specifically indicated to the contrary. The work includes the furnishing, installing, and connecting of a complete working installation in each case to the full extent set forth in the drawings and herein specified. The Contractor shall be responsible for the complete functioning system, unless specifically noted otherwise.

F. The drawings and specifications constitute the Contract Documents and shall be considered as cooperative. Work and material included in either, though not mentioned in both, shall be a part of the work to be accomplished and shall be carried out completely in as thorough manner as if covered by both. All items shown on the drawings and/or listed in the specifications shall be provided and installed by the Contractor unless specifically noted that it will be provided and/or installed by others. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

G. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and accessories that may be required. The Contractor shall carefully investigate the structural and finish conditions affecting all his work and shall arrange such work, accordingly, furnishing such fittings, pipe, traps, valves, and accessories as may be required to make a functional installation at no additional cost to the Owner.

H. Mechanical as built "Record Drawings" shall be kept up to date each day. "Record Drawings" shall be reviewed by Architect/Engineer each month with Contractor's pay request review.

I. Any deviation in work as shown on plans and specifications must be approved in writing by Architect/Engineer prior to installation.

J. Each Contractor shall refer to the Architectural and Structural Drawings and Specifications for the general construction of the building, for floor and ceiling heights, for location of walls, partitions, beams etc., and shall be guided accordingly for the setting of all sleeves and equipment.

K. Under no circumstances shall a Contractor scale the Drawings for the locations of equipment and work.

1.7 EQUIPMENT DESIGN AND INSTALLATION

A. The design, manufacture, testing and method of installation of all apparatus and materials furnished under the requirements of these specifications shall conform to the

applicable standard rules of the following. Where materials are not specifically referred to, but are required, they shall meet the requirements of the applicable code.

B. Unless otherwise specified, equipment and materials of the same type and used for the same purpose, shall be products of the same manufacturer.

C. Each Contractor shall demand and examine all Drawings and Specifications pertaining to the construction before installing the work described and shown under these Drawings and Specifications. Each Contractor shall cooperate with all other Contractors in locating piping, openings, chases, and equipment in order to avoid conflict with any other Contractor's work. It is the responsibility of all trades to examine all shop drawings of other trades that would require equipment to occupy the same space and plane within the building to eliminate any potential conflicts. No extra payment will be allowed for relocation of piping, and equipment not installed in accordance with the above instructions, and which interferes with work and equipment of other Contractors.

D. All appliances, materials and equipment shall be installed and connected in accordance with the best engineering practice and in accordance with manufacturer's instructions and recommendations. All auxiliary piping, special controls, water seals, valves, electrical connections, drains, etc., recommended by the manufacturer, required for proper operation, or required by code shall be furnished and installed complete.

E. All equipment designed and constructed for indoor use shall not be shipped to the site until such time that the equipment is ready for permanent installation in a dry building or may be stored on site provided equipment is stored in a water and moisture tight storage building or job trailer. Covering equipment outdoors with plastic or tarp is not acceptable.

F. All materials and equipment so indicated and all equipment and materials for the electrical portion of the mechanical systems shall bear the approval label of or shall be listed by the Underwriters' Laboratories (UL), Incorporated. Each packaged assembly shall be approved as a package. Approval of components of a package shall not be acceptable.

G. All Contractors shall familiarize themselves with the entire set of contract documents. Specifically, but not limited to ceiling heights specified on Architectural Plans. Where the location of equipment or systems may interfere with ceiling heights or maintenance and access of equipment or systems, the Contractor shall call this to the attention of the Engineer in writing prior to making the installation. Do not install equipment or systems in the affected area until the conflict is resolved. Any such changes shall be anticipated and requested sufficiently in advance to prevent extra work or cost incurred on the part of the Contractor or unduly delay the work.

H. When any Contractor requests approval of materials and/or equipment of different physical size, weight, capacity, function, color, access, that the design allows for it shall be understood that such substitution, if approved, will be made without additional cost to anyone other than the Contractor requesting the change regardless of changes in connections, space requirements, electrical characteristics, etc. from that indicated, electrical service, etc. In all cases where substitutions affect other trades, the Contractor requesting such substitutions shall advise all such Contractors of the change and shall compensate them for all necessary changes in their work. Any Plans, Specifications, Diagrams, etc., required to describe and coordinate such substitutions or deviations shall be professionally prepared at the responsible Contractor’s expense. Review of Shop Drawings by the Engineer does not in any way absolve the Contractor of this responsibility.

I. Coordinate kitchen equipment selection by the General Contractor prior to Bid. Any deviations and/or conflicts for any kitchen equipment shall be the Contractor’s responsibility.

J. The Contractor's work lines, and established heights shall be in strict accordance with drawings and specifications insofar as these drawings and specifications extend. The Contractor shall verify all dimensions shown and establish all elevations and detail dimensions not shown. The Contractor shall also correlate the time so that the work will proceed to the best advantage of the complete job as a unit. The Contractor shall be responsible for furnishing in ample time, any information required to revise footing elevations, build all chases and openings in floors, walls, partitions, ceilings, and roofs to provide clearance which may be required to accommodate the work. The Contractor shall set all sleeves, anchor bolts and inserts required to accommodate his equipment before masonry is constructed.

K. The Contractor shall layout his work well enough in advance to foresee any conflicts or interferences with work of other sections so that in case of interference, his layout may be altered to suit the conditions, prior to the installation of any work. This procedure will require constant coordination with all sections of the work.

1.8 CAPACITIES, SIZES AND OPERATING CONDITIONS

A. Capacities, sizes, and conditions specified or shown on drawings shall be regarded as minimum allowable. If the Contractor proposes to furnish any equipment which would have to operate at other than specified conditions to produce final effects, all other directly or indirectly related components of the entire systems (as well as of the structure, finish, and other systems in the building) must be properly coordinated to the satisfaction of the Engineer. That is: Operating conditions through the entire system must be such that no motor is overloaded, no equipment operates noisier, faster, or hotter than manufacturer's publication recommends and that no excess stress or demand is imposed on any component of any system or the structure; also, that no quality, architectural feature, function or "end result" is affected adversely, in the opinion of the Architect.

B. The Architect/Engineer reserves the right to determine if the Contractor's proposed materials and equipment of any one manufacturer is acceptable in lieu of the specified material or equipment.

C. Where materials and equipment are listed on Drawings and specifications as acceptable or equivalent, this does not relieve the Contractor and/or manufacturer from providing and proving to Architect/Engineer that their materials and equipment are equivalent to items the Architect/Engineer used as a guide specification.

D. The Contractor and manufacturer must confirm to the Architect/Engineer that their equipment and materials will meet the space requirements of the project and that the equipment is easily accessible for maintenance and operation.

1.9 ACCESSIBILITY

A. All equipment, valves, motors, damper operators, traps, unions, and all other items which require adjustment, maintenance, repair, and observation shall be installed in such a fashion that such maintenance, repair, and observation can be readily achieved without undue difficulty. Where the drawings show these items in locations not conforming to the above, the Contractor shall advise the Architect/Engineer of this conflict prior to bid Date otherwise he shall, at his own expense, relocate such items as directed by the Architect/Engineer. Where such items are installed above inaccessible ceilings or in or behind walls, this Contractor shall provide approved access panels unless otherwise directed in these Specifications.

1.10 SUBMITTALS

A. Review of Materials and Equipment: Within 30 days of receipt of notice to proceed, and before starting installation, the Contractor shall submit to the Architect for review, electronically (PDF format), lists of materials, fixtures, and equipment to be incorporated in the work. If departures from the contract drawings are deemed necessary by the Contractor, details of such departures, including changes in related portions of the project

and the reasons therefore shall be submitted with drawings. Where such departures require piping or equipment to be supported otherwise than shown, the details submitted shall include loadings and type and kinds of frames, brackets, stanchions, or other supports necessary. Any departures shall be made at no additional cost to the Owner. The lists of materials and equipment shall be supported by sufficient descriptive material, such as catalog cuts, diagrams, and other data published by the manufacturer, as well as evidence of compliance with safety and performance standards, to demonstrate conformance to the specification requirements; catalog numbers alone will not be acceptable.

B. Conformance to Agency Requirements: Where materials or equipment are specified to be constructed and/or tested in accordance with the standards of the American Society of Mechanical Engineers, the Air Moving and Conditioning Association, or the American Society of Heating, Refrigerating and Air Conditioning Engineers, or to be approved by the Underwriters' Laboratories, Inc., the Contractor shall submit proof that the items furnished under this specification conform to such requirements. A certificate or published statement by the manufacturer will be sufficient evidence that the item conforms to the specified requirements. In lieu of such stamp, certificate, or statement, the Contractor may submit written certificate from any nationally recognized testing agency adequately equipped and competent to perform such services, stating that the items have been tested and that the units conform to the requirements listed hereinbefore, including methods of testing, of the specified agencies.

C. Shop Drawings

1. The review of shop drawings by the Engineer applies only to conformance with the design concept of the project and general compliance with the information given in the Contract Documents. In all cases, the Contractor alone shall be responsible for furnishing the proper quantity of equipment and/or materials required, all applicable codes and regulation are met, all equipment fits the available space in a satisfactory manner and that piping, electrical and all other connections are suitably located.

2. In accordance with the General Conditions, shop drawings shall be submitted on all units of prefabricated materials. Shop drawings shall show, in detail, all parts of the work, fully dimensioned and shall also indicate construction, concealed and other jointing, thickness of materials, method of anchoring and attachment to other materials. Where required for certain work, submit setting and bending diagrams and mark same to correspond with the design drawings, identifying locations of various items. Show types, sizes and locations of sleeves and inserts.

3. Each shop drawing and/or manufacturers descriptive literature shall have the proper notation indicated with all accessories and features and shall be clearly referenced to the specifications and equipment schedules.

4. Both the Contractor and Prime Contractor shall check all shop drawings for completeness and for correctness before submitting the drawings to the Engineer. If major corrections are required on the drawings, the Contractor shall return the drawings to the originator and have the changes made. The Contractor shall indicate his corrections on the prints in green pencil and sign all prints and other material sent to the Engineer.

5. The Mechanical Contractor shall be responsible for final coordination of all electrical requirements (voltage, phase, circuit breaker sizes, wire sizing, etc.) with the Electrical Contractor prior to ordering any equipment or materials. There will be no change in the Contract Amount for any discrepancies.

6. Detail and Erection Drawings: Detail and erection drawings for equipment, piping and other items of this nature shall be carefully prepared in accord with standard

practice and shall show erection plans and member details with all individual parts identified on both the detail sheets and erection plans. All identification markings shall be carefully preserved until after the erection process is completed.

7. Material Data: The Contractor shall submit descriptive data, as required, on pipe, fittings, and valves to be incorporated into the work. This data shall be in sufficient detail to allow the Engineer to determine that the pipe, fittings, and valves meet the requirements of the contract drawings and specifications or that they are an acceptable equal to that specified. All data shall be in the form of manufacturer's or supplier's literature concerning the product and shall indicate catalog number, conditions of use, application instructions, and/or other information as applicable.

8. Equipment Data: The Contractor shall submit descriptive data on all items of equipment to be furnished and installed under this contract. These submittals shall consist of manufacturer's published catalog information which completely describes component materials, configuration and rough-in data for mechanical and electrical equipment shall also include cuts, diagrams, characteristic curves, and capacity information as applicable. Where more than one item of equipment is employed in the same system, the submittal of equipment data will include special diagrams showing the electrical wiring, interconnecting piping, related controls and relation and operation of the various items of equipment for the entire system.

D. Materials, Equipment and Appliances

1. Materials: All materials, equipment, products, and incidentals to be furnished by the Contractor shall be new, unless otherwise specified, undamaged and the first line quality product of the manufacturer and/or supplier, except when competitive grades fully meet the standards specified in the various technical sections of these specifications.

2. Standard Products: Except as otherwise approved by the Engineer, the equipment, and appliances to be furnished under these specifications shall be the standard products of manufacturers regularly engaged in the production of such equipment and shall be the manufacturer's latest standard design. Where two or more units of the same type and class of equipment are required, the units shall be the product of the same manufacturer and shall be identical insofar as possible. The component parts of the products need not be products of one manufacturer.

3. Manufacturer's Directions: Where manufacturer's instructions or recommendations are applicable to the installation or application of materials, the Contractor shall adhere to strict conformance with such instructions or recommendations unless specifically noted to the contrary in these specifications. Where such directions are in conflict with the drawings and specifications, the Contractor shall inform the Engineer of such conflict and request instructions.

4. Samples: The Contractor shall furnish, for approval, samples of materials, profiles, designs, finishes, etc., which are either required by the various sections of specifications or which the Engineer may request from time to time. Samples shall be clearly identified with adequate information for the Engineer's evaluation.

5. Materials and Equipment Delivered to Jobsite: All items of materials, equipment, supplies and miscellaneous items to be incorporated into the work shall be delivered to the jobsite with labels, tags, nameplates and/or containers which clearly indicate the manufacturer's item or catalog number or conformance with the applicable standards stipulated in the technical sections of the specifications.

Any item which cannot be verified in the field shall not be included in the work until its identity can be established by the Engineer.

E. Equipment and Material Substitutions

1. Should the Contractor elect to use and install materials which have been approved for use other than specified, he shall be required to make any necessary changes, perform all work, and furnish any additional materials and ancillary equipment required to make such substituted materials or equipment function or perform as that specified, at no cost to the Owner. This includes structural, electrical and/or other affected trades.

1.11 PROTECTION OF EQUIPMENT AND MATERIALS

A. No piping shall be installed in any part of the building where danger of freezing may exist without adequate protection being given, whether or not insulation is specified for the particular piping. All damage resulting from leaking pipes shall be borne by the Contractor under this Division. Do not install piping across or near openings to the outside whether or not they are carrying static or moving fluids. Insulation on piping does not ensure that freezing will not occur. The Contractor shall contact the Engineer when in doubt.

B. All work, equipment and materials shall be protected at all times. All pipe and ductwork openings shall be closed with caps or plugs during construction. All equipment and accessories shall be tightly covered and protected against dirt, water, or other injury during the period of construction.

C. If the permanent HVAC equipment is used during the construction period for temporary heating, cooling, and ventilating, the equipment must be carefully protected, and filters changes at minimum of once a week. All return air and exhaust air ductwork used in temporary HVAC systems during construction period must be filtered at each opening to prevent construction dust from entering the ductwork system. Use of any permanent systems does not alter or prematurely begin the warranty period.

1.12 EXAMINATION OF SITE

A. Bidders shall visit the site before submitting proposals to satisfy themselves as to the nature and scope of the work and any difficulties attending to the execution.

B. The submission of a proposal will be construed as evidence that such an examination has been made. Later claims for labor, equipment, materials, etc., required for difficulties encountered which could have been foreseen had such an examination been made, will not be recognized.

1.13 EXISTING CONDITIONS

A. The locations of all piping, conduits, cables, utilities, and manholes existing, or otherwise, that comes within the contract construction site, shall be subject to continuous uninterrupted service with no other exception than the Owner of the utilities permission to interrupt same temporarily. Provide a seven (7) day written notice to Engineer, Architect and Owner prior to interrupting any utility service or line.

B. Known utilities and lines as available to the Engineer are shown on the Plans. However, it is additionally required that, prior to any excavation being performed, each Contractor ascertain and mark all utilities or lines that would be endangered by the excavation. Hand dig if required to locate. Contractor shall bear costs of repairing damaged utilities.

C. If utilities or lines occur in the earth within the construction site, the Contractor shall probe and locate the lines prior to machine excavation in the respective area. Hand dig if required to locate.

D. Cutting into existing utilities and services shall be performed in coordination with and as designated by the Owner of the utility. The Contractor shall work continuously to restore

service(s) upon deliberate or accidental interruption, providing premium time and materials as needed without extra claim to the Owner.

E. The Contractor shall repair to the satisfaction of the Owner and Engineer, any surfaces or subsurface improvements damaged during the course of the work, unless such improvement is shown to be abandoned or removed.

F. Machine excavation shall not be permitted with ten feet of gas lines, fuel lines, electrical lines or lines carrying combustible and/or explosive materials. Hand excavate only in accord with utility company, agency or other applicable laws, standards, or regulations.

G. Protect all new or existing lines from damage by traffic, etc. during construction. Repairs or replacement of such damage shall be at the sole expense of the party responsible.

H. Protect existing trees, indicated to remain with fencing or other approved method. Hold all new subsurface lines outside the drip line of trees, offsetting as necessary to protect root structures. Refer to planting or landscaping plans, or in their absence, consult with the Architect.

1.14 DEMOLITION AND SCHEDULE

A. All existing mechanical equipment noted on drawings and listed herein that is to be removed or demolished, shall be removed on schedule, and disposed of as hereinafter directed.

B. All items removed shall become the property of the Contractor and shall be immediately disposed of off-site at Contractor’s expense except as noted on drawings unless otherwise directed by owner.

C. All demolition shall be carefully accomplished in accordance with master construction schedule so as not to remove any item required for support operation during the planned schedule. No item shall be removed until full schedule is worked out with Contractors according to owner’s demands and agreed to in writing by the Engineer.

D. Storage will be arranged during scheduling process. Contractors to provide own storage and security.

E. Contractor doing the demolition of equipment must conform to the Clean Air Act of 1990. Refrigerant must be recovered from any air conditioning or refrigeration equipment prior to disconnecting and disposal. The Contractor must own and use recovery equipment to meet this requirement. The Contractor will be responsible for disposal of refrigerant, refrigerant oil, or equipment.

F. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damage or unserviceable portion and replace with new products of equal capacity and quality. All existing piping to remain shall be permanently capped, new or existing valves are not adequate.

1.15 CUTTING AND PATCHING

A. All cutting and patching required in connection with the installation of this work, and work due to errors, defective work, ill-timed work, or tardiness in properly designating size and location in sufficient time or by failure to notify other trades, shall be done under this section, but only in the manner directed by the Engineer so as to prevent or minimize damage to installed work. Damage as a result of cutting for installation, shall be repaired by mechanics skilled in the trade involved, at no additional expense to the Owner.

B. No cutting of structural members will be permitted, except when prior permission of the Engineer has been obtained. This work must conform in every respect to the surrounding finish and to the quality of workmanship and materials used.

C. Piercing of any waterproofing or roofing shall be done only by the trade involved. After the part piercing the waterproofing has been set in place, the opening made for this purpose shall be filled and made absolutely watertight to the satisfaction of the Engineer.

D. See Section: 230517 - SLEEVING, CUTTING, PATCHING AND REPAIRING - MECHANICAL

1.16 FIRE AND SMOKE-STOPPING

A. Fire-stopping and smoke-stopping shall be provided around all piping and ductwork penetrations of fire rated and/or smoke-rated floors, walls, ceilings, or other barriers.

B. The materials used shall be UL 263 or UL 1479 classified and meet ASTM E814 standards and be rated for assemblies where applied.

C. Clean surfaces to be in contact with penetration seal materials, of dirt, grease, oil, loose materials, rust, or other substances that may affect proper fitting, adhesion, or the required fire resistance.

D. Install penetration seal materials in accordance with manufacturer's instruction.

E. Seal holes or voids may be penetrations to ensure an effective fire and/or smoke barrier.

F. Protect materials from damage on surfaces subject to traffic.

G. Stop insulation flush with wall on insulated pipe and seal edges.

H. All exposed piping passing through floors, ceilings and walls in finished areas shall be fitted with a chrome plated escutcheon of sufficient outside diameter to amply cover the sleeved opening and ad inside diameter to closely fit the pipe around which it is installed.

I. Galvanized sheet metal collars shall be provided around all ducts, equipment, etc., exposed in finished areas. Where such openings are finished and the space around the unit is small, the collar may be omitted with the approval of the Architect.

1.17 CONCRETE WORK AND ANCHOR BOLTS

A. The Contractor under this Division shall provide all concrete bases, curbs and pads for all floor and ground mounted equipment unless otherwise indicated.

B. The Contractor under this Division shall verify the sizes and locations of all supports, bases, and pads prior to pouring of same to be certain that the installed units will be compatible.

C. The Contractor under this Division shall set anchor bolts when required for the equipment prior to pouring of concrete. Sizes and exact locations of bolts shall be determined by the manufacturer's recommendations for the equipment served.

D. Concrete work must be provided in strict accordance with Section 03 Concrete Work. As a minimum provide pads using 3500 psi concrete not less than 3.5 inches high reinforced with WI.4 x WI.4 welded wire fabric. Chamfer top and edge corners with 3/4" preformed chamfer strips. Subbases shall rest on structural floor and shall be reinforced with steel rods and interconnected with floor reinforcing bars by tie bars hooked at both ends or suitable dowels. Slope top to floor drain if drain is provided in pad.

1.18 ELECTRIC MOTORS

A. All motors shall be designed, tested, and applied in accordance with the applicable standards listed hereinbefore. Motors shall be of sufficient size for the duty to be performed and shall not exceed the full load rating when the driven equipment is operating at specified capacity. Unless otherwise specified, all motors shall be high efficiency type and shall have open frames and continuous-duty classification based on 50 degrees C. ambient temperature. Polyphase motors shall be squirrel-cage type, having normal-starting-torque and low-starting-current characteristics. Motors shall meet

NEMA high efficiency standards MGI - 1.41.2 for energy efficient polyphase squirrel-cage motor. Efficiency shall be in accordance with MGI - 1.2.55. When motor horse powers required differ from those indicated on the drawings, the Contractor shall make the necessary adjustments to the wiring, disconnect devices, starters, and branch-circuit protection at no additional cost to the Owner.

1. Motors shall be rated for continuous duty capable of driving the connected loads without exceeding temperature limitations of the motor insulation. Special Class A moisture-resisting insulation (designed to operate in a 122-degree F. ambient without exceeding a temperature rise rating designated by NEMA for the type of enclosure used) shall be utilized in each motor.

B. Unless otherwise indicated or specified, the electrical components required to operate mechanical equipment, such as, motors, float and pressure switches, solenoid valves, and other devices functioning to control the mechanical equipment, shall be furnished as part of the mechanical equipment, shall be complete and operable, and shall be included under this section of the specifications. All motor starters not part of a motor control center shall be included under this Section and shall be the hand off auto type with 3 over-loads on 3 phase units and 120V control transformer. Conduit and wires required for external electrical connections shall be furnished and are specified under DIVISION 26 - ELECTRICAL. Integral phase failure relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Mechanical Contractor shall coordinate staggered restart times as required.

1.19 DRIVES

A. Each belt-connected motor-driven unit or fan shall be provided with a variable pitch V-belt drive.

B. Sheaves shall be of cast iron or of steel, statically and dynamically balanced, bored to fit properly on the shafts and secured with key of proper size. Sheaves having set screws alone will not be permitted. Sheaves shall be variable pitched and shall be designed to give the required rpm at approximately the mid-position of adjustment. Pitch diameters of sheaves shall be not less than 3.0 inches for "A" section belts; 5.4 inches for "B" section belts; 9.0 inches for "C" section belts; and 13.0 inches for "D" section belts.

C. Belts shall be selected for a minimum service factor of 1.5 (based on motor nameplate horsepower) and selected and matched in sets for equal tension.

D. All other drives shall be as described under the respective equipment paragraph of these Specifications, as applicable.

1.20 ACCESS PANELS

A. The Mechanical Contractor shall furnish all other access panels needed for access to valves, open receptacles, vents, fire dampers, mechanical units, etc., in inaccessible locations installed under this Division of the work.

B. Access panels shall have a minimum size of 12" x 12" and shall be centered beneath equipment for accessibility and maintenance. Access panels must be of adequate size to service, observe, remove, and maintain equipment.

C. Access panels shall be equal to the types specified under the Architectural Specifications. As a minimum the access panels shall be equivalent to Acudor Products, Cendrex, Inc., MIFAB, Inc., Lane-Aire Manufacturing, 14 gauge with vandal proof lock and frame as selected by Architect. Access panels shall be fire rated when installed in fire rated construction.

D. Access panels shall have a primed white finish.

E. Ceiling Types

1. In areas with suspended acoustical tile ceilings (installed on exposed metal grid suspension system so that the tile may be readily removed), equipment, valves, etc., install above these ceilings will be considered to be accessible.

2. All plastered ceilings or ceilings having concealed spline type of suspension system will be considered as not removable for accessibility to equipment; therefore, access panels will be required.

3. See Architectural Drawings and Specifications for the types of ceilings throughout the building.

F. Access panels shall be installed by sub-Contractor specialized in access panel installation.

1.21 CONNECTION TO EQUIPMENT SPECIFIED IN OTHER SECTIONS

A. Examine all Contract Documents and be thoroughly familiar with all items of equipment in other sections or by Owner, unless otherwise specified or indicated on Drawings. Rough-in for and make final connections to all equipment which requires any of the services specified in this Section and including furnishing and install all valves, P-traps, unions, vacuum breakers, and all other specialties as required to make all work and equipment final and operating. It is the intent of the Contract Drawings to detail and indicate all such equipment; however, be responsible for notifying Architect/Engineer in writing of major discrepancies seven (7) days prior to Bid Date; otherwise, all such connections shall be made at no extra cost. The Contractor shall finally connect mechanical services (water, sanitary, gas, air, etc.), to any terminal equipment, appliances, kitchen equipment, etc., provided under this and/or other divisions of the work. Various equipment connections indicated are based upon “basis of design” equipment selections. Should alternate equipment be purchased, then this Contractor shall make the necessary provisions in the Bid for any and all differences. Change Orders shall not be considered for any differences due to alternate equipment purchase. Such connections shall be made in strict accord with current codes, safety regulations and the equipment manufacturer’s recommendations. If in doubt, contact the Engineer prior to installation.

B. Unless specified otherwise, all conduit, wiring and connections for power to mechanical equipment will be provided by Electrical Contractor. Be responsible for correct sequences of operation of all mechanical equipment after all wiring has been completed.

1.22 SAFETY

A. The Contractor and his Sub-Contractors for the project shall comply with all applicable Federal, State, and local laws governing safeguards, safety devices, and protective equipment and shall take all other needed actions which they may determine or which the Department may determine to be reasonably necessary to protect the life and health of all employees and personnel on the project, provide for the safety of the public and protect all property affected by the performance of the work covered by the contract.

B. As provided in KRS Chapter 338 in the Kentucky Occupational Safety and Health Act and in subsequent regulations and standards promulgated by the Kentucky Occupational Safety and Health Standards Board, neither the Contractor nor his Sub-Contractors shall require any laborer or mechanic employed in performance of the contract to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety.

C. The Contractor shall not remove or disturb any suspected hazardous materials, including asbestos-containing materials, lead based paints, electrical equipment containing PCB’s, or any other except as instructed in this contract. If any material not covered by the contract is encountered, notify the Engineer immediately.

D. All belts, pulleys, chains, gears, couplings, projecting setscrews, keys and other rotating parts located so that any person can come in close proximity thereto shall be fully enclosed or properly guarded.

1.23 OPERATING INSTRUCTIONS / START-UP

A. After all tests have been completed and work accepted by the Owner, a competent representative shall, at a time determined by the Engineer, present verbal, and visual instructions to the Owner's personnel in the proper operation of his respective system. For this purpose, each section of work shall be demonstrated and explained to the Owner's personnel and sufficient time allotted for instructions.

B. The Contractor shall include in their bid to provide equipment and controls startup and verification for all mechanical systems specified for this project.

C. A pre-start-up conference shall be held with the Architect, Engineer, Owner, General Contractor, Mechanical Contractor, Electrical Contractor, Controls Contractor, Test and Balance Contractor, Commissioning Agent (where applicable), and the Manufacturer's providing startup services. The purpose of this meeting will be discuss the goals, procedures, etc. for start-up.

D. Specific startup/verification specifications are included throughout the Mechanical Specifications. In general, as part of the verification process, equipment suppliers shall perform start-up by their factory authorized technicians, not third party Contractors, and shall complete and submit start-up reports/checklists. The Contractor shall have appropriate trades on site to correct all deficiencies noted by the factory representative. For each deficiency noted, documentation of corrective action (including date and time) shall be submitted to the Engineer and Owner. Where factory start-up is not specified for a particular piece of equipment or system, the Contractor shall be responsible to perform start-up. All information shall be completed by the Contractor and submitted to the Owner/Engineer prior to acceptance of the equipment.

E. The Contractor shall be responsible for completion of System Verification Checklists/Manufacturer's Checklists. Factory startup is required for all HVAC equipment noted. Unless noted otherwise, as part of the verification process, equipment suppliers shall perform start-up by their factory authorized technicians and shall complete and submit start-up reports/checklists. This shall include the following:

1. Gas-Fired Furnaces/Cooling Coils
2. Condensing Units
3. Exhaust Fans
4. Temperature Controls

F. Except for the specific equipment specified in this Specification Section, the manufacturer's recommended startup procedures and checklists will be acceptable for use in the project. Where "manufacturer" startup is not specified, then this Contractor shall perform startup services in strict accordance with manufacturer's instructions. All startup/verification process shall be thoroughly documented by the Contractor and shall include the time and date when performed.

G. The Contractor shall "zip-tie" a start-up report to each piece of equipment in a clear plastic cover. Once start-up completion is verified by the Engineer the Contractor shall remove all reports and consolidate them into close-out documentation. The Contractor shall be responsible for completion of System Verification Checklist (SVC) / Manufacturer's Checklists.

1.24 TESTS

A. All tests required to establish the adequacy, quality, safety, completed status and suitable operation of each system and all components thereof shall be made in the presence of

and to the satisfaction of the Engineer or his authorized representative and other representatives of State and local Government. All instruments, labor, and expert service necessary to conduct these tests shall be supplied by the Contractor; power and fuel will be furnished by the Owner.

B. The final inspection and tests are to be made only after the Engineer is satisfied that the work described in these specifications has been completely installed in accordance with the true spirit and intent of these specifications and that complete preliminary tests were made which indicate adequacy, quality, completion, and satisfactory operation. The acceptance of the work herein specified, shall not in any way prejudice the Owner's right to demand replacement of defective material and/or workmanship.

C. The Architect/Engineer shall be notified by the Contractor under this Division forty-eight (48) hours in advance of any tests so that the Architect/Engineer or his representative may be present when the tests are run. Leaks or imperfections found shall be corrected and a new test shall be run to the satisfaction of the Architect/Engineer. Upon successful completion of the test, pipe covering may be applied, and piping may be concealed. A successful test, even if witnessed, however, does not relieve the Contractor under this Division of the responsibility for any failure during the guarantee period.

D. After pipe fabrication has been completed, all water piping shall be subjected to a hydrostatic test of 100 psi and proven tight and free of leaks for a 24-hour period. Tests shall be applied to the piping before being attached to any equipment which would be damaged by the test pressure. Damage to equipment caused by testing shall be repaired or replaced without additional cost to the Owner.

E. Exterior water piping shall be tested in strict compliance with local water company. The minimum hydrostatic test pressure is 1 1/2 times the water pressure serving the site.

F. No insulation, paint, backfill or other prohibitive covering shall be applied to piping prior to the above tests.

G. Provide all temporary equipment, materials, valves, gauges, etc., required for the preceding tests.

H. The expense of all tests shall be borne by the Contractor under this Division.

I. In addition to the testing specified above the Contractor shall perform the following HVAC systems tests and place the system(s) in operation to demonstrate that all features of the system(s) including instrumentation, controls, and equipment function as specified for final acceptance.

1. At such time as the Engineer determines that the new heating, ventilating, and cooling system is ready to be placed into service, the Contractor shall place the new equipment in operation and demonstrate that the safety devices are in proper working order to the satisfaction of the Engineer.

2. The Contractor shall then maintain operation and demonstrate each system's capability of producing at full load capacity. Within 24 hours after the systems have been satisfactorily tested, Owner operating personnel will relieve the Contractor of the operations and the Contractor shall continue his work on a joint occupation basis.

3. Depending on the status of the work, the Contractor may at his option conduct other required tests concurrent with, prior to, or following the system testing, providing the Engineer is satisfied the installation is in conformance with the specifications. However, all features of the system(s) shall be tested individually for proper operation at partial and full load conditions and collectively where normal operations require the several components to operate concurrently to constitute an acceptable system.

4. Final acceptance of the entire installation will be based on an acceptable demonstration that all components, local and remote, respond to safety manual and Automatic System controls. During this test, the Contractor shall cause simulated perturbations for which the control system is designed to respond. All control, monitor and readout points in the system shall function properly before final acceptance is made.

1.25 CLEANING

A. Before the building is turned over to the Owner, all of the piping, ductwork and equipment must be carefully cleaned of debris and dust. All coils shall be cleaned and flushed out with new filters installed.

B. Utilities and Equipment: The Contractor shall provide all necessary temporary materials and equipment to clean the piping and equipment installed under this specification. No permanent equipment shall be used for storage, mixing, settling, compressing, pumping, etc., without the approval of the Architect. The Contractor shall supply a separate and independent source of clean, dry, oil-free air for the blowdown of systems requiring this method of cleaning.

C. Use of Chemicals: No chemicals, wetting or drying agents shall be used to clean systems or equipment where the materials of the system undergo any changes in their physical or structural characteristics. In case of any doubt as to the compatibility of any materials to the cleaning solution used, the Contractor shall obtain prior written approval for the use of the solution from the manufacturer of the equipment. Piping systems, equipment and sub-assemblies shall be cleaned after completion of welding, machining, threading, testing and any other operations capable of contaminating the system piping or equipment. After cleaning, the permanent strainers shall be removed, cleaned, and replaced. Temporary strainers shall be periodically removed, cleaned, and replaced during cleaning in lines ahead of equipment to protect against particles becoming lodged in the equipment.

D. After the Architect/Engineer has complete examination, this Contractor shall remove all stickers, tags, etc., and shall thoroughly clean all equipment, fixtures, and materials installed under his section of the work.

E. Surplus material, rubbish and equipment resulting from the work shall be removed from the building and premises by the Contractor upon completion of the work in accordance with the General Conditions.

F. All equipment shall be thoroughly cleaned to "Factory New" condition prior to turning over to owner. Touch up or completely repaint equipment as required.

G. Keep all nameplates on equipment clean and exposed for easy reading.

1.26 PUNCH LISTS

A. The Contractor shall prepare and complete punch lists for all their scope of work and all associated Sub-Contractors.

B. The Engineer shall be notified one week in advance of above ceiling and below ceiling / final inspections.

C. Upon completion of all punch list items, the Contractor shall request that the Engineer develop a punch list. After all corrections have been made from the Engineer's punch list, the Contractor shall review and initial off on each item. This signed-off punch list shall be submitted to the Engineer. The Engineer shall return to the site only once to review each punch list and all work prior to the ceilings being installed and at the final punch list review. The Contractor’s representative may be requested at the inspections.

D. Upon inspection by the Engineer, if there are discrepancies found indicating the punch list is incomplete and additional visits will be required by the Engineer to review the

incomplete work, the Engineer shall be reimbursed directly by the Contractor. This payment shall be made by check or money order to STW and due 10 days from date of each additional visit at a rate of $125.00 per hour plus travel expense for any extra trips required to complete either/any of the above ceiling, below ceiling or final punch lists. Sign-off on project completion will not be granted by the Engineer until all punch list items are deemed corrected at the Engineer's discretion and any additional monies due have been received by the STW.

1.27 WARRANTY AND SERVICE

A. All equipment and labor shall be warranted for a period of at least one (1) year from the date of acceptance, as evidenced by date of substantial completion for the entire project or for the last phase of the project, whichever occurs later, against defective materials, design, and workmanship. In addition to the equipment warranty, the Contractor shall provide all repair and adjustment service necessary for the proper operation of the entire system for a period of one (1) year after the date of acceptance, as evidenced by the date of substantial completion for the entire project or for the last phase of the project, whichever occurs later. Upon receipt of notice from the Owner's representative of failure of any part of the warranted system or equipment during the warranty period, the affected part shall be replaced promptly with a new part without cost to the Owner. Upon failure to take action within 24 hours after being notified, the work will be accomplished by the Engineer at the expense of the Contractor. See General Conditions and individual equipment specifications. Note that the warranty period of time specified in this section represents the minimum warranty period required for work performed under specification Division 21, 22 and 23. Where the General Conditions and/or individual equipment/system specifications require a warranty period of longer duration or earlier start date than specified in this paragraph, the longer duration/earlier start date shall supersede for those portions of work covered by that specification. In the event the Contractor is notified of warranty issues but does not correct or address the warranty issues prior to the end of the specified warranty period, the Contractor will not be relieved of the responsibility to correct the deficient items after the warranty end date has passed.

B. Make a minimum of two (2) service calls during guarantee period, free of charge, to check with Owner and to check and repair malfunctioning equipment which was installed. Service calls shall be in middle and end of guarantee period and as required to maintain systems operation. Dates shall be listed in operating and maintenance manuals, along with Contractor's name and phone number.

C. The use of any permanent systems prior to substantial completion or the time identified by the GC/CM (whichever is more strict), does not alter or prematurely begin the warranty period.

D. The Contractor shall furnish three (3) copies of all Final Inspection Certificates obtained to the Engineer when work is complete. Final payment for work will be contingent upon compliance with this requirement.

1.28 AS-BUILT DRAWINGS, DESCRIPTIVE DATA AND O&M MANUALS

A. During construction, the Contractor shall retain a set of blue line drawings on the site for recording all changes. These drawings shall be available for inspection by the Engineer.

B. The Contractor shall deliver to the Engineer at the completion of the work, one (1) print of "As-Built" drawings, showing legibly and accurately, mechanical and piping systems with equipment locations shown as actually installed. Changes in original plans shall be neatly shown in red pencil. Each print shall be signed by the sub-Contractor who has done the work.

C. Operating Instructions and Maintenance Manuals, Etc.

1. At completion of the contract, the Owner shall be provided with three (3) bound copies of operations and maintenance instructions, recommended list of spare

parts required for a period of one (1) year and a list of any special tools required to maintain the equipment for the various items of the mechanical equipment. Where special tools are required, the Contractor shall furnish two (2) of each such tools to the Owner at no additional contract cost.

2. MANUAL SHALL INCLUDE ALL APPROVED SHOP DRAWINGS OF EQUIPMENT REQUIRING OPERATION AND MAINTENANCE INFORMATION.

3. MANUAL SHALL BE ORGANIZED WITH APPROVED SHOP DRAWING FOLLOWED BY ALL RELATED OPERATION AND MAINTENANCE MATERIAL.

4. EQUIPMENT SHALL BE IDENTIFIED IN ACCORDANCE WITH THE DRAWING NOMENCLATURE AND INCLUDE SUPPLIER OF SAID EQUIPMENT.

5. Instructions shall be included for routine checking of all items requiring continued maintenance.

6. Schematic drawings with actual pieces of mechanical equipment, etc., shall be included; where manufacturer's parts numbers only are applicable, they shall be included.

7. Detailed operating instructions for mechanical equipment shall be included, as well as general maintenance procedures to be followed on such equipment. Manufacturers maintenance and operation manuals will be required where such are normally available with the equipment, but as such information is often of a general nature and applicable to various models of equipment, such information shall be supplemented by specified typed directions for the particular piece of equipment applicable to this project.

1.29 DIGITAL DATA AND FILE TRANSMISSION

A. Sub-Contractors (SC) requiring digital files to prepare shop drawings and governmental agency submittals shall make their request through the Construction Manager (CM) or General Contractor (GC).

1. The CM/GC shall compile a list of requested drawings from the respective SC's and submit one comprehensive list to STW.

2. STW will provide the CM/GC with a digital file transmission release form. The CM/GC may sign and return or have the requesting SC's sign and return to STW through the CM/GC.

3. After receiving the signed release form, STW will provide one set of all requested digital files to the CM/GC to then distribute to the appropriate SC's.

4. STW will provide AutoCAD/dwg files.

a. Revit/BIM models will not be provided to Contractors. Projects completed using REVIT will be exported to AutoCAD prior to releasing.

B. The project architect is the owner/author of the floor plans and reflected ceiling plans.

1. The architect must approve the release of these plans before STW can release our respective drawings.

2. Requests for floor plans and/or reflected ceiling plans only shall be made directly to the architect.

END OF SECTION 23 01 00

SECTION 23 01 30.51 – HVAC AIR DISTRIBUTION SYSTEM CLEANING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISION FOR MECHANICAL WORK.

1.2 SCOPE OF WORK

A. This Section includes cleaning of the following existing duct systems as noted.

1. Perform cleaning and Mold Remediation process to Louvers and Plenums as described on the Contract Documents, including an Antimicrobial coating (Foster’s 40-20) to the internal insulation to seal the insulation and inhibit Mold and Mildew growth.
2. Utilize multi-stage HEPA filtered vacuums, air whips and attachments to clean and remove dirt, dust and debris from Louvers and Plenums
3. Apply a Sanitizing solution (Foster’s 40-80) to all internal surfaces of the equipment listed above.
4. Apply Fiberlock IAQ8500 coating to the internal insulation to seal the fiberglass insulation to the address the delaminating of the fiberglass fibers.
5. Install sheet metal access doors to gain access to interior of duct and use aluminum type duct tape to reattach & seal external insulation at access doors in the duct where needed.
6. Properly collect, contain, and dispose of material removed from duct system.
7. HEPA filtered Air Scrubbers shall be placed in work areas during the cleaning process to capture air bourn particulate and provide Negative Pressure during the cleaning process.
8. Work to be performed in accordance with National Air Duct Cleaners Association (NADCA) standards.
9. Digital Photographs shall be taken before and after cleaning and sealing process with copies being provided to customer.

1.3 DEFINITIONS

A. ASCS: Air system cleaning specialist.

B. NADCA: National Air Duct Cleaners Association.

C. SMACNA: Sheet Metal and Air Conditioning Contractors' National Association.

1.4 ACTION SUBMITTALS

A. Product Data:

1. Cleaning agents.
2. Antimicrobial surface treatments.
3. Manufacturer Certificates: Signed by manufacturers certifying that products comply with requirements.

B. Qualification Data: For ASCS.

C. Field quality-control test reports.

1. Project's existing conditions.

2. Project's cleaned conditions.

1.5 CLOSEOUT SUBMITTALS

A. Pre- and Post-Project report to be included in operation and maintenance manuals.

1.6 QUALITY ASSURANCE

A. ASCS Qualifications: A certified member of NADCA.

1. Certification: Employ a staff of ASCSs certified by NADCA.

2. Supervisor Qualifications: Certified as an ASCS by NADCA.

3. Experience: Submit records of experience in the field of HVAC systems cleaning.

4. Equipment, Materials, and Labor: Have equipment, materials, and labor required to perform specified services.

B. Comply with current published standards of NADCA.

C. UL Compliance: Comply with UL 181 and UL 181A for fibrous-glass ducts.

PART 2 - PRODUCTS

2.1 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.

2.2 SHEET METAL MATERIALS

A. Comply with SMACNA's "HVAC Duct Construction Standards - Metal and Flexible" for acceptable materials, material thicknesses, and duct construction methods, unless otherwise indicated.

B. Galvanized-Steel Sheet: Lock-forming quality; complying with ASTM A 653/A 653M and having G90 coating designation; ducts shall have mill-phosphatized finish for surfaces exposed to view.

C. Reinforcement Shapes and Plates: Galvanized-steel reinforcement where installed on galvanized sheet metal ducts; compatible materials for aluminum and stainless-steel ducts.

D. Tie Rods: Galvanized steel, 1/4-inch minimum diameter for lengths 36 inches or less; 3/8-inch minimum diameter for lengths longer than 36 inches.

2.3 DUCT-MOUNTING ACCESS DOORS

A. See Section 233300.

2.4 FLEXIBLE CONNECTORS

A. See Section 233300

2.5 FLEXIBLE DUCTS

A. See Section 233113.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine systems to determine appropriate methods, tools, and equipment required for performance of work.

B. Prepare written report listing conditions detrimental to performance of work.

C. Proceed with work only after unsatisfactory conditions have been corrected.

D. Perform “Project Evaluation and Recommendation” according to NADCA ACR 2006.

3.2 CLEANING

A. Engage a qualified ASCS to clean as indicated in paragraph 1.5A.

B. Comply with NADCA ACR 2006.

C. Perform cleaning before air balancing or mark position of dampers and air-directional mechanical devices before cleaning.

D. Use duct-mounted access doors, as required, for physical and mechanical entry and for inspection.

1. Install additional duct-mounting access doors to comply with duct cleaning standards.

2. Disconnect and reconnect flexible ducts as needed for cleaning and inspection. Replace damaged and deteriorated flexible ducts.

3. Disconnect and reconnect flexible connectors as needed for cleaning and inspection. Replace damaged and deteriorated flexible connectors.

4. Remove and reinstall ceiling components to gain access for duct cleaning. Clean ceiling components after they have been removed and replaced.

E. Mark position of dampers and air-directional mechanical devices before cleaning and restore to their marked position on completion.

F. Particulate Collection and Odor Control:

1. Where venting vacuuming system inside building, use HEPA filtration with 99.97 percent collection efficiency for 0.3-micron size (or greater) particles.

2. When venting vacuuming system outside building, use filtration to contain debris removed from the HVAC system and locate exhaust down wind and away from air intakes and other points of entry into building.

G. Mechanical Cleaning Methodology:

1. Clean metal-duct systems using mechanical cleaning methods that extract contaminants from within duct systems and remove contaminants from building.

2. Use vacuum-collection devices that are operated continuously during cleaning. Connect vacuum device to downstream end of ducts so areas being cleaned are under negative pressure.

3. Use mechanical agitation to dislodge debris adhered to interior duct surfaces without damaging integrity of metal ducts or duct liner.

4. Clean fibrous-glass duct liner with HEPA vacuuming equipment, and do not permit duct liner to get wet. Replace fibrous-glass duct liner that is damaged, deteriorated, or delaminated or that has friable material, mold, or fungus growth.

5. Biocidal Agents and Coatings: Apply an Antimicrobial Sealer to internally insulated ducts and components. Sealer to be guaranteed for 10 years to protect insulation and prevent microbial growth. Use according to manufacturer's written instructions after removal of surface deposits and debris.

H. Cleanliness Verification:

1. Verify cleanliness after mechanical cleaning and before application of treatment, including biocidal agents and protective coatings.

2. Visually inspect metal-duct systems for contaminants.

3. Where contaminants are discovered, re-clean and re-inspect duct systems.

3.3 DUCT ACCESSORIES INSTALLATION

A. Install duct accessories according to applicable details in SMACNA's "HVAC Duct Construction Standards--Metal and Flexible" for metal ducts and in NAIMA AH116, "Fibrous Glass Duct Construction Standards," for fibrous-glass ducts.

B. Provide duct accessories of materials suited to duct materials; use galvanized-steel accessories in galvanized-steel and fibrous-glass ducts, stainless-steel accessories in stainless-steel ducts, and aluminum accessories in aluminum ducts.

C. Install duct-mounting access doors where access doors do not currently exist to allow for the cleaning of ducts and accessories.

3.4 CONNECTIONS

A. Reconnect ducts to fans and air-handling units with existing flexible connectors after cleaning ducts and flexible connectors. Report any existing damaged and deteriorated flexible connectors, to Engineer/Owner.

3.5 CLEANLINESS VERIFICATION

A. Verify cleanliness according to NADCA ACR 2006, "Verification of HVAC System Cleanliness" Section.

B. Verify HVAC system cleanliness after mechanical cleaning and before applying any treatment or introducing any treatment-related substance to the HVAC system, including biocidal agents and coatings.

C. Perform visual inspection for cleanliness. If no contaminants are evident through visual inspection, the HVAC system shall be considered clean. If visible contaminants are evident through visual inspection, those portions of the system where contaminants are visible shall be re-cleaned and subjected to re-inspection for cleanliness.

END OF SECTION 23 01 30.51

SECTION 23 05 17 – SLEEVING, CUTTING, PATCHING AND REPAIRING FOR MECHANICAL

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes requirements for the Mechanical Contractor related to sleeving, cutting, patching, and repairing associated with mechanical work.

1.2 WORK INCLUDED

A. Sleeves

B. Grout

C. Escutcheons

D. Lintels

1.3 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

PART 2 - PRODUCTS

2.1 SLEEVES

A. Galvanized-Steel Wall Pipes: ASTM A 53/A 53M, Schedule 40, with plain ends and welded steel collar; zinc coated.

B. Galvanized-Steel-Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, zinc coated, with plain ends.

C. PVC-Pipe Sleeves: ASTM D 1785, Schedule 40.

D. Galvanized-Steel-Sheet Sleeves: 0.0239-inch minimum thickness, round tube closed with longitudinal joint.

2.2 GROUT

A. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.

B. Characteristics: Non-shrink; recommended for interior and exterior applications.

C. Design Mix: 5000-psi, 28-day compressive strength.

D. Packaging: Premixed and factory packaged.

2.3 ESCUTCHEONS

A. Escutcheons shall be Beaton and Caldwell; Carpenter and Patterson; Fee and Mason or approved equivalent. Chromium-plated iron or chromium-plated brass, either one piece or split patterns, held in place by internal spring tension or set screw that completely covers opening.

2.4 LINTELS

A. New openings under 48" in width: Provide one 3 1/2" x 3 1/2" x 3 1/2" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

B. New openings 48" to 96" in width: Provide one 3 1/2" x 6" x 3/8" steel angle for each 4" of masonry width. Lintel shall have 8" bearing on either side.

C. New openings over 96" in width: Consult the project structural engineer.

PART 3 - EXECUTION

3.1 GENERAL

A. The Contractor shall be responsible for all openings, sleeves, trenches, etc., that he may require or create by demolition in floors, roofs, ceilings, walls, etc., and shall coordinate all such work with the General Contractor and all other trades. Coordinate with the General Contractor, any openings which he is to provide before submitting a bid proposal in order to avoid conflict and disagreement during construction. Improperly located openings shall be reworked at the expense of the Contractor.

B. The Contractor shall plan his work ahead and shall place sleeves, frames or forms through the walls, floors, and ceilings during the initial construction, where it is necessary for piping, ductwork, conduit, etc., to go throughout; however, when this is not done, the Contractor shall do all cutting and patching required for the installation of his work, or he shall pay other trades for doing this work when so directed by the Engineer. Any damage caused to the buildings by the workmen of the responsible Contractor must be corrected or rectified by him at his own expense.

C. The Contractor shall notify other trades in due time where he will require openings or chases in new concrete or masonry. He shall set all concrete inserts and sleeves for his work. Failing to do this, he shall cut openings for his work and patch same as required at his own expense.

D. The Contractor shall be responsible for properly shoring, bracing, supporting, etc., any existing and/or new construction to guard against cracking, settling, collapsing, displacing, or weakening while openings are being made. Any damage occurring to the existing and/or new structures, due to failure to exercise proper precautions or due to action of the elements shall be promptly and properly made good to the satisfaction of the Engineer.

E. All work improperly done or not done at all as required by the Mechanical Trades in this section, will be performed by the Contractor at the direction of the trade whose work is affected.

3.2 SLEEVES

A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.

1. Sleeves are not required for core-drilled holes.

C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.

1. Cut sleeves to length for mounting flush with both surfaces.

a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.

2. Using grout, seal the space outside of sleeves in slabs and walls without sleeve-seal system.

D. Install sleeves for pipes passing through interior partitions.

1. Cut sleeves to length for mounting flush with both surfaces.
2. Install sleeves that are large enough to provide 1/4-inch (6.4-mm) annular clear space between sleeve and pipe or pipe insulation.
3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.

E. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials.

F. Pipes Passing Through Waterproofing Membranes: Pipes passing through floor waterproofing membrane shall be installed through a 4-pound lead-flashing sleeve, or a 0.032-inch thick aluminum sleeve, each with an integral skirt or flange. Flashing sleeve shall be suitably formed, and the skirt of flange shall extend not less than 8 inches from the pipe and shall set over the floor membrane in a troweled coating of bituminous cement. The flashing sleeve shall extend up the pipe a minimum of 1 inch above the floor. The annular space between the flashing sleeve and the metal-jacket-covered insulation shall be sealed. At the Contractor's option, pipes passing through floor waterproofing membrane may be installed through a cast iron sleeve with caulking recess, anchor lugs, flashing clamp device, and a pressure ring with brass bolts. Waterproofing membrane shall be clamped into space and sealant shall be placed in the caulking recess.

G. Pipes Passing Through Roof: Pipes passing through the roof shall be installed where shown on the drawings. Any penetration in roof shall be approved by the Roofing Manufacturer.

H. Openings for ductwork, fixtures, equipment, etc. through floors, walls, ceiling, and roofs, shall be located and sized by the Contractor under this division who shall provide and set necessary lintels, sleeves, and sheet metal forms for all such openings.

I. Galvanized sheet metal collars shall be provided around all ducts, equipment, etc., exposed in finished areas. Where such openings and finished and the space around the penetration is small, the collar may be omitted with the approval of the Architect/Engineer.

3.3 ESCUTCHEONS

A. Escutcheons shall be provided at all finished surfaces where exposed piping, bare or insulated, passes through floors, walls, or ceilings. Escutcheons shall be fastened securely to pipe sleeves or to extensions of sleeves without any part of sleeves being visible. Where sleeves project slightly from floors, special deep-type escutcheons shall be used.

3.4 CUTTING

A. All rectangular or special shaped openings in plaster, stucco, or similar materials, including gypsum board, shall be framed by means of plaster frames, casing beads, wood or metal angle members as required. The intent of this requirement is to provide smooth even termination of wall, floor, and ceiling finishes as well as to provide a fastening means for grilles, diffusers, lighting fixtures, etc.

B. All trades shall coordinate all openings in masonry walls with the General Contractor, and, unless otherwise indicated on the Architectural drawings, shall provide lintels for all openings required for the plumbing work (piping, wall boxes, etc.).

C. No cutting is to be done at points or in a manner that will weaken the structure and unnecessary cutting must be avoided. If in doubt, contact the engineer.

D. Pipe openings in slabs and walls shall be cut with core drill. Hammer devices will not be permitted. Edges of trenches and large openings shall be scribe cut with a masonry saw.

E. Openings in metal building walls shall be made in strict accord with building suppliers recommendations.

3.5 PATCHING AND REPAIRING

A. Patching and repairing made necessary by work performed under this division shall be included as part of the work and shall be done by skilled mechanics of the trade or trades for work cut or damaged, in strict accordance with the provisions herein before specified for work of like type to match adjacent surfaces and in a manner acceptable to the engineer.

B. Where portions of existing lawns, shrubs, paving, etc. are disturbed for installation or work of this Division, such items shall be repaired and/or replaced to the satisfaction of the engineer.

C. Where the installation or removal of piping, etc. requires or creates the penetration of fire or smoked rated walls, ceilings or floors, the space around such pipe, etc., shall be tightly filled with an approved non-combustible fire insulating material satisfactory to maintain the rating integrity of the wall, floor or ceilings affected.

D. Piping passing through floors, ceilings, and walls in finished areas, unless otherwise specified, shall be fitted with chrome plated brass escutcheons of sufficient outside diameter to amply cover the sleeved openings and an inside diameter to closely fit the pipe around which it is installed.

E. Where pipes pass through exterior walls, the wall openings shall be sealed air and watertight. This shall include sealing on both sides of the wall to insure air and water does not enter or exit the wall cavity. This is especially critical on exterior walls where the wall cavity may be vented to the exterior.

END OF SECTION 23 05 17

SECTION 23 05 48 – VIBRATION CONTROL FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This specification includes vibration isolation, equipment balancing requirements and sound level criteria for equipment spaces and exterior mounted equipment.

B. Mechanical and electrical equipment and associated piping and ductwork shall be mounted on vibration isolators as specified and/or required to minimize transmission of vibration and structure-borne noise to building structure or spaces.

C. All rotating equipment shall be balanced both statically and dynamically. The equipment when mounted and placed in operation shall not exceed a self-excited vibration velocity of 0.10 inches per second in the vertical, horizontal, or axial directions when measured with a vibration meter on the bearing caps or at the equipment mounting feet if the bearings are concealed.

D. Section Includes:

1. Elastomeric Isolators
2. Suspension Type Isolators
3. Spring Isolators

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product.
    a. Include rated load, rated deflection, and overload capacity for each vibration isolation device.
    b. Detail fabrication and assembly of equipment bases.
    c. Vibration Isolation Base Details: Detail fabrication including anchorages and attachments to structure and to supported equipment. Include adjustable motor bases, rails, and frames for equipment mounting.

1.4 SHOP DRAWINGS

A. Shop drawings shall be submitted as required in Section 230100: GENERAL PROVISIONS FOR MECHANICAL WORK. See Submittal Sheet.

B. Shop drawings for neoprene mounts, or pads and spring isolators with neoprene components shall contain a certification that the neoprene compound complies with the industry standards for physical properties.

C. All steel frames, steel bases and rails and vibration isolation units except those installed as part of the packaged equipment prior to shipment shall be furnished by one vibration isolation manufacturer.

D. All submittals for equipment bases and equipment and piping isolation shall be in one brochure. The isolation units including steel base for each piece of equipment and connected piping shall be grouped together. Each isolation unit in the group shall show the equipment location, weight supported, type unit specified, and type unit selected. Data for each spring isolator shall include outside diameter, deflection, operating spring height, solid spring height and the ratio of outside diameter to the operating height. Submittal shall include detail drawings, cut sheets, and catalog data showing foundations, bases, and isolators for all equipment. Certifications required for isolation materials shall be placed on all submittal drawings and catalog sheets containing neoprene items. The sound power levels in Db with reference to 10 - 12 watts, in the nine frequency bands between 31 and 8000 Hertz, exterior to the equipment as it effects the equipment space sound level shall be included with the data submitted for approval of the equipment. The sound power levels of the equipment with the resultant sound pressure levels for a room acoustics factor of 0.15 shall be plotted on an octave band analysis chart containing the broad band and pure tone Db sound pressure levels specified. When the equipment sound levels exceed the specification levels in any of the frequencies, the submittal shall include the sound attenuating enclosure or other method proposed to reduce the equipment sound level to that specified, with supporting data.

E. The submittals for equipment mounted at the exterior of the building, or generating outside noise, shall include sound level calculations showing equipment sound level limitations based on the requirements hereinbefore specified and applicable sound level ordinances. The equipment sound pressure levels in all nine frequency bands between 31 and 8000 Hertz shall be included in the data. Where required to comply with the sound level limitations, the sound attenuation method proposed, with supporting data, shall be included with the equipment submittal.

1.5 EQUIPMENT SOUND ATTENUATION

A. The sound pressure levels in occupied spaces generated by any mechanical and electrical equipment as transmitted by the building structure, supply or return duct borne, duct breakout or airborne through mechanical room wall and ceiling shall not exceed the following:

Octave Band Hertz							
Mid Frequency	63	125	250	500	1000	2000	4000
Sound Pressure Level dB	57	48	41	35	31	29	28

B. The maximum allowable sound pressure levels shall be reduced by 5 Db in any octave band where field tests indicate pure tone generation.

C. When equipment sound levels exceed the specified noise criteria removable acoustical enclosures, alterations to the equipment, or other approved means shall be provided to reduce the noise level to that specified. Ventilation openings in enclosures shall be provided with sound traps, access openings, observation ports and lights shall be provided where required for normal operation, observation, and servicing.

D. Equipment sound power levels may be obtained by laboratory tests measured in accordance with ASHRAE Standard No. 35-36 or by field testing. All equipment sound power tests shall be certified for compliance with the specified test procedure and accuracy by the test personnel and a responsible official of the test company.

E. Mechanical equipment installed within or outside the building shall comply with all local, city, state, and OSHA sound level requirements.

F. Test instruments shall be calibrated for accuracy by an approved testing laboratory or by the manufacturer. Certificates showing degree of accuracy shall be furnished to the Engineer.

G. All labor, instruments and appliances required for the tests shall be furnished by the Contractor.

1.6 VIBRATION

A. Isolation system shall be stable during starting and stopping of equipment without excessive transverse or eccentric movement.

B. The installed vibration isolation system shall have a maximum lateral motion under start-up and shut-down conditions of 0.25 inch. Motions in excess shall be restrained by approved spring type mountings.

C. All electrical and piping connections shall be sufficiently flexible to permit proper isolation.

D. Isolation components shall be selected for the lowest operating speed of the equipment.

E. Isolators, including springs, exposed to weather shall be hot dip galvanized after fabrication.

F. Isolators shall be selected and located to produce uniform loading and deflection even when equipment weight is not evenly distributed.

G. The type of isolation, base and minimum deflection shall be as required for each specific application when supported on a solid concrete slab, 6 inches total thick minimum. Vibration isolators with a deflection greater than the minimum specified shall be submitted for approval if they are needed to meet the noise criteria.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Mason Industries, Amber/Booth Company, Vibration Elimination Co., Inc.

2.2 ELASTOMERIC ISOLATORS

A. Elastomeric isolators shall be one of the following:

1. Neoprene isolation mounts of the straight-line deflection curve type. The isolation mounts shall be manufactured with bolt holes for bolting to equipment base. Bottom steel plates for mounting to subbase shall be provided where required to prevent movement of equipment. These isolators shall be molded in black oil-resistant neoprene and color coded. All metal parts shall be embedded in neoprene.

2. Neoprene pads shall be of cross-ribbed or waffle design, 5/16-inch minimum thickness. Where concentrated load bearing is encountered, steel bearing plates shall be bonded to the neoprene pads. The neoprene pads shall be sized for a load of 50 psi.

2.3 SPRING ISOLATORS

A. Spring isolators shall be free-standing, laterally stable without any housing and complete with 1/4-inch-thick neoprene acoustical friction pads between the base plate and the support.

B. All mountings shall have leveling bolts. Coil outside diameters shall be not less than 0.8 of the operating height.

C. Spring shall have an additional travel to solid equal to 50% of the operating deflection.

D. The horizontal stiffness of spring isolators shall be not less than 0.8 of the vertical (axial) stiffness.

E. Springs shall be designed and installed so that the ends remain parallel during and after deflection to operating height.

2.4 SUSPENSION TYPE ISOLATION

A. Suspension type spring isolation for piping system or equipment hangers shall be a combination of spring and neoprene in series. The spring and elastomer combination shall be encased in a structurally stable steel bracket. Spring diameters shall be large enough to permit a 15-degree angular misalignment of the rod without rubbing on the hanger box.

B. Suspension type elastomeric isolators shall be double deflection. Isolators shall be mounted in an open steel bracket with openings for hanger rod connections. The hanger rod shall be separated from contact with the hanger bracket by a neoprene grommet. The neoprene isolator shall have a minimum deflection of 0.35 inch.

C. Where required, pipe hangers shall be equipped with a method of holding the piping at a fixed elevation during installation and a secondary adjustment to transfer the load to the spring and maintain the same elevation. Deflection shall be clearly indicated by a permanent pointer and scale.

D. Duct isolation hangers shall consist of spring and neoprene grommet, or mount encased in a steel bracket with suitable means of connecting to ducts and building structure.

2.5 FOUNDATIONS FOR MACHINERY

A. Subbases of 3500 PSI concrete not less than 4 inches high shall be provided for all floor and ground mounted mechanical equipment. Subbases shall rest on structural floor and shall be reinforced with steel rods and interconnected with floor reinforcing bars by tie bars hooked at both ends or suitable dowels. A minimum clearance of 1 percent of the maximum base dimension or 1 inch shall be provided between subbases and all steel bases and steel saddles with equipment in operation.

B. Each electric motor shall be mounted on the same foundation as the driven machine.

C. Foundations for machines shall be a minimum of 2500 psi concrete with all exposed surfaces, steel troweled smooth and corners beveled.

D. Machines shall be secured to steel bases with anchor bolts of ample size. All machines having baseplates shall be grouted under the full area of the baseplate with a non-shrinking, premixed grout.

PART 3 - EXECUTION

3.1 Provide equipment and piping vibration isolation where required by equipment manufacturer and where called for on drawings.

3.2 Type of vibration isolators to be provided shall be based as follows:

1. Static deflection up to 1/4 inch - single deflection neoprene mounting or pads.
2. Static deflection 5/16 inch to 3/8 inch - double deflection neoprene mountings.
3. Static deflection above 3/8 inch - spring isolators.

END OF SECTION 23 05 48

SECTION 23 05 53 – IDENTIFICATION OF HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

A. Identification of products installed under Division 23 including:

1. Plastic Nameplates
2. Plastic Tags
3. Metal Tags
4. Stencils and Paint

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.
2. Equipment Label Schedule: Include a listing of all piping and equipment to be labeled with the proposed content for each label.
3. Submit list of wording, symbols, letter size, and color coding for mechanical identification.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: Valve Schedules for each piping system to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Brady Corp., Craftmark Pipe Markers, Seton Identification Products.

2.2 Color: Unless specified otherwise, conform with ANSI/ASME A13.1.

2.3 Plastic Nameplates: Laminated three-layer plastic with engraved black letters on light contrasting background color.

2.4 Plastic Tags: Laminated three-layer plastic with engraved black letters on light contrasting background color. Tag size minimum 1-1/2-inch square.

2.5 Metal Tags: Brass or aluminum with stamped letters; tag size minimum 1-1/2-inch diameter with smooth edges.

2.6 Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
3/4" - 1-1/4”	8"	1/2"

1-1/2" - 2"	8"	3/4"
2-1/2" - 6"	12"	1-1/4"
8" - 10"	24"	2-1/2"
Over 10"	32"	3-1/2"

A. Stencil Paint: Semi-gloss enamel black unless otherwise indicated.

PART 3 - EXECUTION

3.1 PREPARATION

A. Degrease and clean surfaces to receive adhesive for identification materials and to accept stencil painting.

3.2 INSTALLATION

A. Plastic Nameplates: Install with corrosive-resistant mechanical fasteners, or adhesive.

B. Plastic or Metal Tags: Install with corrosive-resistant chain.

C. Stencil Painting: Apply in accordance with manufacturer's instructions.

D. Equipment: Identify HVAC equipment such as but not limited to air handing equipment, condensing units, chillers, pumps, storage tanks, expansion tanks, water treatment devices etc. with plastic nameplates. Small devices, such as in-line pumps, may be identified with plastic or metal tags.

E. Controls: Identify control panels and major control components outside panels with plastic nameplates.

END OF SECTION 23 05 53

SECTION 23 05 93 – TEST, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL SPECIFICATIONS

1.1 DESCRIPTION OF WORK

A. The total system balance shall be performed by an independent test and balance firm that specializes in testing and balancing of HVAC systems.

B. This specialty firm shall perform the following:

1. On-going job site inspections of equipment, controls, and metering devices during construction to verify conformance with design specifications.
2. Air System Balance
    a. Outside Air Systems
    b. Supply Air Systems
    c. Return Air Systems
    d. Exhaust Air Systems
3. Control Systems Verification

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 – GENERAL PROVISION'S FOR MECHANICAL WORK

1.3 DEFINITIONS

A. ASHRAE: American Society of Heating, Refrigerating and Air Conditioning Engineers.

B. HVAC: Heating, Ventilating and Air Conditioning.

C. NAS: National Account Services. An enhanced program of testing and balancing offering an expanded range of services including a Quality Assurance Guaranty.

D. TAB: Testing, Adjusting and Balancing of HVAC systems to meet design objectives and obtain optimum system performance.

E. TBE: Test and Balance Engineer is an individual certified by AABC or NEBB as having a degree in engineering and 3 years of test and balance experience, or, 5 years of background in the air conditioning field and 5 years continuous field experience in testing and balancing work.

1.4 REFERENCES

A. 2011 ASHRAE Handbook, HVAC Applications, Chapter 38, Testing, Adjusting and Balancing.

1.5 AGENCY QUALIFICATIONS

A. Testing and Balancing (TAB) Agency shall be a member of the AABC or NEBB.

B. A certified Test-and-Balance Engineer (TBE) shall be responsible for certification of the total work of this section.

C. All work shall be performed in accordance with AABC National Standards. If these specifications set forth more stringent requirements than the AABC National Standards, these specifications shall prevail.

1.6 QUALIFICATION SUBMITTALS

A. Testing and Balancing (TAB) Agency shall submit a company resume listing personnel and project experience in the field of air and hydronic system balancing.

B. TAB Agency shall furnish all necessary calibrated instrumentation to adequately perform the specified products. TAB Agency shall submit an inventory and calibration data of all instruments and devices in possession of the balancing agency, to enable the Owner, or his representative, to evaluate the balancing agency's performance capability.

C. The TAB Agency shall, upon acceptance of the contract, submit to the Owner, or the Owner's representative, a "Quality Assurance Guaranty".

D. Within 30 days after acceptance of the contract, the TAB Agency shall submit to the Design Engineer a working agenda which will include procedures for testing and balancing each type of air and water flow system. The Test and Balance Report format will also be submitted indicating data to be recorded.

1.7 NOTIFICATION AND SCHEDULING

A. A pre-balance conference shall be held prior to job start as scheduled by the Tab Agency. Attendees at the meeting shall include representatives of the Test and Balance (TAB) Agency, General Contractor, Mechanical Sub Contractor, Control Sub Contractor, Owner and Mechanical Engineer.

B. The schedule for testing and balancing the HVAC system shall be established by the General Contractor, and/or Owner’s representative, in coordination with the TAB Agency on a critical path network.

C. The TAB Agency is responsible for initiating this continuing coordinating to determine schedule for final testing and balancing services.

D. It will be necessary for the TAB Agency to perform its services in close coordination with the Mechanical Contractor, with all scheduling and deficiencies reported through the General Contractor, and/or Owner’s representative.

E. Before testing and balancing commences, the TAB Agency shall receive notification in writing from the Mechanical Contractor that the system is operational, complete, and ready for balancing.

F. A completed system means more than just physical installation. The Mechanical Contractor shall certify that all prime movers; fans, pumps, refrigeration machines, boilers, etc., are installed in good working order, and that full load performance has been preliminarily tested.

G. The Mechanical Contractor shall certify in writing that all equipment has been checked, started, and adjusted by the manufacturer and operated for the specified period.

1.8 COORDINATION WITH OTHER TRADES

A. To bring the HVAC system into a state or readiness for testing adjusting and balancing, the Mechanical Contractor shall perform the following:

1. Air Distribution Systems

a. Ensure that all splitters, extractors, volume, smoke, and fire dampers are properly located and functional. Dampers serving requirements of smoke, minimum and maximum outside, return, relief, and exhaust air shall provide tight closure and full opening, with a smooth and free operation.

b. Verify that all supply, return, exhaust, and transfer grilles, registers, diffusers, and high-pressure terminal units are installed and operational.

c. Ensure that air handling systems, units, and associated apparatus, such as heating and cooling coils, filter sections, access doors, etc. are blanked and/or sealed to eliminate excessive bypass or leakage of air.

d. Ensure that all fans (supply, return, relief, and exhaust) are operating and free of vibration. All fans and drives shall be checked for proper fan rotation and belt tension. Overload protection shall be of proper size and rating. A record of motor current and voltage shall be made to verify that the motors do not exceed nameplate rating.

e. Make any necessary changes to the sheaves, belts, and dampers, as required by the TAB Agency, at no additional cost to Owner.

f. Install clean filters prior to testing.

B. The Temperature Control Subcontractor Shall Perform the Following:

1. Verify that all control components are installed in accordance with project requirements and are functional, including all electrical interlocks, damper sequences, air and water resets, and fire and freeze stats.

2. Verify that all controlling instruments are calibrated and set for design operating conditions.

3. Calibrate room thermostats after installation and before the thermostat control verification tests are performed. The Test and Balance (TAB) Agency shall verify the accuracy of final settings by taking temperature readings. The readings shall be in a typical conditioned space for each separately controlled zone.

4. The Control Contractor shall allow sufficient time in the project to provide assistance and instruction to the TAB Agency in the proper use and setting of control components such as, but not limited to, computers, static pressure controllers, or any other device that may need set points changed so that the testing and balancing work can be performed.

C. The General Contractor and/or Owner's representative, Mechanical Contractor, Temperature Control Subcontractor, and the suppliers of the HVAC equipment shall all cooperate with the TAB Agency to provide all necessary data on the design and proper application of the system components. In addition, they shall furnish all labor and materials required to eliminate any system deficiencies.

D. In coordination with the General Contractor and/or Owner's representative, the TAB Agency shall arrange for an area of ample size and convenient location for storage of tools, equipment, and other items as required.

PART 2 - PRODUCTS

NOT APPLICABLE

PART 3 - EXECUTION

3.1 ON-GOING JOB SITE INSPECTIONS

A. During construction, the balancing agency shall inspect the installation of pipe systems, sheet metal work, temperature controls, and other component parts of the HVAC systems. Inspections shall be conducted a minimum of 3 times. (Typically, this is performed when 60% of the duct work is installed and again when 90% of the total system is installed and prior to insulation of the piping.)

B. The balancing agency shall submit a written report of each inspection to the Owner or owner's representative, and the contractors responsible for correcting noted deficiencies.

C. Check for necessary balancing hardware (dampers, flow meters, valves, pressure taps, thermometer wells, etc.) to determine if they are installed properly and readily accessible.

D. Identify and evaluate any variations from system design.

E. Identify and report possible restrictions in systems (closed fire dampers, long runs of flexible duct, poorly designed duct fittings, etc.).

3.2 AIR SYSTEM TEST AND BALANCE PROCEDURES

A. Fan Speeds: Test and adjust fan RPM to achieve design CFM requirements.

B. Current and Voltage: Measure and record motor current and voltage.

C. Pitot Tube Traverse: Perform a Pitot tube traverse of main supply and return ducts to obtain total CFM. If a Pitot tube traverse is not practical, the summation of the outlets or inlets may be used. An explanation of why a traverse was not made must appear on the appropriate data sheet.

D. Outside Air: Test and adjust system minimum outside air by Pitot tube traverse. If a Pitot tube traverse is not practical, the percentage of outside air may be determined by calculations from the return air, outside air, and mixed air temperature. Make allowances for heat of compression and motor heat where applicable.

E. Static Pressure: Test and record system static pressures, including suction and discharge static pressure profile of each fan.

F. Air Temperature: Take wet bulb and dry bulb air temperatures on the entering and leaving side of each cooling coil. Dry bulb temperatures shall be taken on the entering and leaving side of each heating coil.

G. Zone Ducts (supply and return): Adjust zone ducts to within design CFM requirements. At least one zone balancing damper shall be completely open.

H. Main Ducts: Adjust main ducts to within design CFM requirements. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.

I. Branch Ducts: Adjust branch ducts to within design CFM requirements. Multi-diffuser branch ducts shall have at least one outlet or inlet volume damper completely open.

J. Tolerance - test and balance each diffuser, grille, and register to within 10 percent of design requirement.

K. Identification: Identify the location and area of each grille, diffuser, register, and terminal box. This information shall be recorded on air outlet data sheets.

L. Description: Record the size and type of each diffuser, grille, and register on air outlet data sheets.

M. Minimizing Drafts: Adjust all diffusers, grilles, and registers to minimize drafts in all areas.

N. Exhaust Fans: Measure exhaust fan static pressure, total CFM, makeup air and fan RPM. Measure motor operating voltage and amperage.

O. Measure exhaust fan static pressures, total CFM, makeup air and fan RPM.

P. Measure motor operating voltage and amperage.

Q. Record the specified against the actual supplied horsepower and electrical characteristics of all motors.

3.3 CONTROL SYSTEMS VERIFICATION

A. Verify that all control devices are properly connected.

B. Verify that all dampers, valves, and other controlled devices are operated by the intended controller.

C. Verify that all dampers and valves are in the position indicated by the controller (open, closed or modulating).

D. Verify the integrity of valves and dampers in terms of tightness of close-off and full-open positions. This includes dampers in multizone units.

E. Check that all valves are properly installed in the piping system in relation to direction of flow and location.

F. Check the calibration of all controllers.

G. Verify the proper application of all normally open and normally closed valves.

H. Check the location of all thermostats and humidistats for potential erratic operation from outside influences such as sunlight, drafts, or cold walls.

I. Check the locations of all sensors to determine whether their position will allow them to sense only the intended temperatures or pressures of the media. Control Contractor will relocate as deemed necessary by the TAB Agency.

J. Check the sequence of operation that any control mode is in accordance with approved shop drawings. Verify that only minimum simultaneous heating and cooling occurs.

K. Verify that all controller set points meet the design intent.

L. Check all dampers for free travel.

M. Verify the operation of all interlock systems.

N. Perform all system verification to assure the safety of the system and its components.

3.4 SYSTEM PERFORMANCE VERIFICATION

A. At the time of final inspection, the Test and Balance (TAB) Agency shall recheck, in the presence of the Owner's Representative, specific and random selections of data, air quantities, and air motion recorded in the Certified Report.

B. Points and areas for recheck shall be selected by the Owner's Representative.

C. Measurement and test procedures shall be the same as approved for work forming basis of Certified Report.

D. Selections for recheck, specific plus random, will not normally exceed 25 percent of the total number tabulated in the report, except that special air systems may require a complete recheck for safety reasons.

E. If random tests elicit a measured flow deviation of ten percent or more from that recorded in the Certified Report listings, by ten percent or more of the selected recheck stations, the report is rejected, all systems shall be readjusted and tested, new data recorded, new Certified Report submitted, and new inspection tests made, all at no additional cost to Owner.

F. Following system verification of the Certified Report by the Owner's Representative, the settings of all valves, splitters, dampers, and other adjustment devices shall be permanently marked by the TAB Agency, so that adjustment can be restored if disturbed at any time. Devices shall not be marked until after system verification.

G. Opposite Season Test

1. The Testing and Balancing (TAB) Agency shall perform an inspection of the HVAC system during the opposite season from that in which the initial adjustments were made. The TAB Agency shall make any necessary modifications to the initial adjustments to produce optimum system operation.

3.5 RECORD AND REPORT DATA

A. The Test and Balance Report shall be complete with logs, data and records as required herein. All logs, data and records shall be typed on white bond paper and bound. The

report shall be certified accurate and complete by the Testing and Balancing (TAB) Agency's certified Test and Balance Engineer.

B. Copies of the Test and Balance Report are required and shall be submitted to the Owner, or the Owner's representative.

C. The report shall contain the following general data in a format selected by the TAB Agency.

1. Project number.
2. Contract number.
3. Project title.
4. Project location.
5. Project architect.
6. Project mechanical engineer.
7. Test and balance agency.
8. Test and Balance Engineer.
9. General contractor.
10. Mechanical subcontractor.
11. Date tests were performed.
12. Certification.

D. The Test and Balance Report shall be recorded on report forms conforming to the recommended forms in AABC National Standards. At a minimum, the report shall include:

1. Preface: A general discussion of the system, any abnormalities and problems encountered.
2. Instrumentation List: The list of instruments including type, model, manufacturer, serial number, and calibration dates.
3. Air Handling Equipment
    a. Manufacturer, model number, and serial number.
    b. All design and manufacturer related data.
    c. Total actual CFM by traverse if practical, if not practical, the sum of the outlets may be used, or a combination of each of these procedures. For specific systems, such as ones with diversity, see the AABC National Standards.
    d. Suction and discharge static pressure of each fan, as applicable.
    e. Outside air and return air total CFM.
    f. Exhaust air total CFM.
    g. Actual operating current, voltage, and brake horsepower of each fan motor.
    h. Final RPM of each fan.
    i. Fan and motor sheave manufacturer, model, size, number of grooves, and center distance.
    j. Belt size and quantity.

k. Static pressure controls' final operating set points.

4. Pumps

a. Manufacturer, size, and serial number.

b. All design and manufacturer's related data.

c. Pump operating suction and discharge pressure and final total dynamic head.

d. No flow (pump discharge valve closed) suction and discharge pressure and corresponding total dynamic head. This procedure is to determine actual impeller size.

e. Rated and actual operating current, voltage, and brake horsepower of each pump motor.

f. Submit pump curve showing design, operating, and no-flow points of operation.

5. Coils

a. Manufacturer.

b. All design and manufacturer's related data.

c. Rated and actual water pressure drop through each coil and related GPM.

d. Rated and actual static pressure drop across each coil.

e. Entering and leaving water temperatures.

f. Wet bulb and dry bulb temperatures entering and leaving each cooling coil; dry bulb temperatures entering and leaving each heating coil.

6. Electric Heating Coil/Duct Heater

a. Manufacturer and model number.

b. All design and manufacturer rated data.

c. Actual operating current and voltage.

d. Coil location and identification number.

END OF SECTION 23 05 93

SECTION 23 06 00 – MECHANICAL SYSTEMS DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:

1. Demonstration of operation of systems, subsystems, and equipment.
2. Training in operation and maintenance of systems, subsystems, and equipment.
3. Demonstration and training recordings.

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISION FOR MECHANICAL WORK

1.3 SUBMITTALS

A. Instruction Program: Submit copies of outline of instructional program for demonstration and training, including a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module

1. At completion of training, submit training manual for Owner's use which includes receipts signed by the Owner acknowledging that training took place.

B. Attendance Record: For each training module, submit list of participants and length of instruction time.

C. Demonstration and Training Videos: Provide recording of all demonstrations and training given and submit video within ten days of end of each training module.

1. Identification: Provide an applied label with the following:
   a. Name of Project
   b. Name of Engineer
   c. Name of Contractor
   d. Date video was recorded
   e. Description of information recorded.
2. Transcript: Prepared on 8-1/2-by 11-inch paper, punched and bound in heavy-duty, three ring, vinyl-covered binders. Mark appropriate identification on front and spine of each binder. Include a cover sheet with same label information as the corresponding video recording. Include name of Project and date of video recording on each page.

1.4 COORDINATION

A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to minimize disrupting Owner's operations.

B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.

C. Coordinate content of training modules with operation and maintenance manual information.

PART 2 - PRODUCTS

2.1 DEMONSTRATION AND TRAINING PROGRAM

A. Provide program that includes individual training modules for each system and equipment not a part of a system as required by individual Specification Sections and as follows, but not limited to:

1. HVAC: Provide demonstration and training by showing Owner personnel the major components of the HVAC system as follows:

a. Gas-Fired Furnaces/Cooling Coils

b. Condensing Units

c. Exhaust Fans

d. Instrumentation and Controls overview

PART 3 - EXECUTION

3.1 PREPARATION

A. Assemble materials necessary for instruction, including documentation and training module. Assemble training modules into a combined training manual.

3.2 INSTRUCTION

A. Engage qualified instructors to instruct Owner personnel to adjust, operate, and maintain systems, subsystems, and equipment not a part of a system.

B. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at the start of each season.

C. Schedule training with Owner, through Architect/Engineer, with at least ten days' advance notice.

3.3 DEMONSTRATION AND TRAINING RECORDINGS

A. Engage a qualified individual to record demonstration and training video(s). Record each training module separately. Include classroom instructions and demonstrations.

B. Format: Provide high-quality DVD or thumb drive. Cloud storage is unacceptable.

C. Narration: Describe scenes on video while recording. Include description of items being viewed.

D. Transcript: Provide typewritten transcript of the narration.

END OF SECTION 23 06 00

SECTION 23 07 19 – HVAC PIPING INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Piping Insulation

B. Jackets and Accessories

1.2 RELATED WORK

A. The General and Special Conditions and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 230553 - IDENTIFICATION OF HVAC PIPING AND EQUIPMENT

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. 1. Product Data: For each type of product. Include thermal conductivity, water-vapor permeance thickness, and jackets (both factory and field applied if any).

1.4 QUALITY ASSURANCE

A. Materials: Flame spread smoke developed rating of 25/50 in accordance with ASTM E84.

B. All pipe insulation shall be installed by mechanics specializing in this type of work. The finished product shall present a neat and workmanlike appearance. Insulation shall not be applied until all tests except operating tests have been completed, all foreign material, such as rust, scale, or dirt, has been removed and the surfaces are clean and dry. Insulation shall be clean and dry when installed and during the application of any finish.

C. The insulation, insulating materials and related items shall be delivered to the jobsite in the manufacturer's unopened containers. The containers shall have labels stating the manufacturer's name, contents, quantity and other pertinent data.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Insulations having the thermal and physical properties of the specific materials specified hereinafter, of any of the following manufacturers, or approved equal, are acceptable.

Armstrong	Knauf
Johns Mansville	Certain Teed/Saint Gobain
Owens Corning	Pittsburgh Corning
Rubatex	

B. The Engineer reserves the right to determine if the proposed insulating materials of any one manufacturer are acceptable in lieu of the specific insulation selected for the following applications.

2.2 INSULATION

A. Type A glass fiber insulation; ANSI/ASTM C547; 'k' value of 0.23 minimum at 75 degrees F; noncombustible.

B. Type B cellular foam; flexible, plastic; 'k' value of 0.25 minimum at 75 degrees F; ASTM C534. APArmaflex W (white) or APArmaflex SS (black) or equal.

2.3 JACKETS

A. Vapor Barrier Jackets: Kraft reinforced foil vapor barrier with self-sealing adhesive joints.

B. PVC Jackets: One piece, premolded type.

C. Canvas Jackets: UL listed treated cotton fabric, 6 oz/sq yd.

2.4 ACCESSORIES

A. Insulation Bands: 3/4 inch wide; 0.015 inch thick galvanized steel, stainless steel. 0.007 inch 0.18 thick aluminum.

B. Metal Jacket Bands: 3/8 inch wide; 0.015 inch thick aluminum. 0.010 inch thick stainless steel.

C. Insulating Cement: ANSI/ASTM C195; hydraulic setting mineral wool.

D. Finishing Cement: ASTM C449.

E. Fibrous Glass Cloth: Untreaded; 9 oz/sq yd weight.

F. Adhesives: Compatible with insulation.

G. Treated wooden blocks.

PART 3 - EXECUTION

3.1 PREPARATION

A. Install materials after piping has been tested and approved.

3.2 INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Continue insulation with vapor barrier through penetrations, except on fire rated walls.

C. In exposed piping, locate insulation and cover seams in least visible locations.

D. On insulated piping with vapor barrier, insulate fittings, valves, unions, flanges, strainers, flexible connections, and expansion joints.

E. Provide an insert, not less than 6 inches long, of same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2 inches diameter or larger, to prevent insulation from sagging at support points. Inserts shall be cork or other heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used. Insert shall extend around bottom 120 degrees of pipe barrel and shall be included inside vapor barrier jacket where applied. See Section 230529 for shields and hangers.

F. Neatly finish insulation at supports, protrusions, and interruptions.

G. Jackets

1. Indoor, Concealed Applications: Insulated pipes shall have standard jackets, with vapor barrier, factory-applied or field-applied. Insulate fittings, joints, and valves with insulation of like material and thickness as adjoining pipe, and finish with glass cloth and adhesive. PVC jackets may be used.

2. Indoor, Exposed Applications: For pipe exposed in mechanical equipment rooms or in finished spaces, insulate as for concealed applications. Finish with canvas jacket; size for finish painting. This jacketing must be properly applied with lagging adhesive, such that the outer surface is smooth and free of wrinkles. Do not use PVC jackets. All chilled water piping insulation shall be completely sealed so that a perfect vapor barrier is achieved.

3. Indoor, Field-Applied Jacket Schedule: Install jacket over insulation material. For insulation with factory-applied jacket, install the field-applied jacket over the factory-applied jacket. Piping jacket shall be Stainless Steel, Type 304 or Type 316, Smooth 2B Finish: 0.020 inch thick.

4. Outdoor, Field-Applied Jacket Schedule: Install jacketing on all piping to be installed outside the building per the following: foil faced, UV-resistant vapor barrier and weather barrier membrane, self-stick, self-healing, with a zero perm rating; for use on exterior duct, piping, and vessels. Jacketing shall be a high strength foil/polymer laminate coated with self-healing, self-adhering rubberized asphalt. Jacketing shall not require 'slip joints' and shall expand and contract with the system without rupture or leakage. Jacketing shall be for use as UV protection, weather protection, vapor barrier, and mechanical protection; and simple 'peel and stick' installation.

5. Flanges, Valves, Anchors and Fittings: Unless otherwise specified, all flanges, valves, anchors and fittings shall be insulated with factory premolded or field fabricated segments of insulation of the same materials and thickness as the adjoining pipe insulation. When segments of insulation are used, elbows shall be provided with not less than three segments. For other fittings and valves, segments shall be cut to required curvatures, or nesting size sectional insulation shall be used. The segments of the insulation shall be properly placed and jointed with fire-resistant adhesive. After the insulation segments are firmly in place, fire-resistant vapor barrier coating shall be applied over the insulation in two coats with glass tape embedded between coats. The coating shall be applied to a total dry film thickness of 1/16 inch minimum. All glass tape seams shall be terminated neatly at the ends of the unions with insulating cement troweled on the bevel. For piping operating below ambient temperature, the beveled ends shall receive a coat of vapor barrier coating. Where anchors are used and secured directly to low temperature piping, they shall be insulated for a distance to prevent condensation, but not less than 6 inches from the surface of the pipe insulation. For jacket facing to receive finish painting, the factory applied jacket shall be as specified herein, except that the kraft paper shall be light colored with the kraft paper exposed. Field applied vapor barrier jacket shall conform to the above conditions where finish painting is required.

INSULATION APPLICATION AND THICKNESS (inches)

PIPE SYSTEM	TYPE	TEMP RANGE DEG F	Pipe Diameter Range (inches) <1	1 - 1.5	1.5 - 4	4 - <8	≥8
			Insulation Thickness (inches				
CONDENSATE DRAIN	B		0.5	0.5	0.5	0.5	0.5
REFRIGERANT	B		0.5	1.0	1.0	1.0	1.0

END OF SECTION 23 07 19

SECTION 23 31 13 – DUCTWORK AND DUCTWORK INSULATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Low Pressure Ducts

B. Insulation

C. Duct Cleaning

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 233300 – DUCTWORK ACCESSORIES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product data: For each type of the following:

a. Ductwork.

b. Ductwork insulations.

c. Ductwork Hangers.

1.4 REFERENCES

A. ASHRAE - Handbook 2013 Fundamentals; Chapter 21- Duct Design.

B. ASHRAE - Handbook 1989 HVAC Systems and Equipment; Chapter 19 - Duct Construction.

C. ASHRAE - Surface Burning Characteristics of Building Materials.

D. NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

E. NFPA 90B - Installation of Warm Air Heating and Air Conditioning Systems.

F. IMC - International Mechanical Code - Latest Issue

G. SMACNA - HVAC Duct Construction Standards, Metal and Flexible.

H. UL 181 - Factory-made Air Ducts and Connections.

1.5 DEFINITIONS

A. Duct Sizes: Inside clear dimensions. For lined ducts, maintain sizes inside lining.

B. Low Pressure: Up to 2” WG positive or negative and/or velocities less than 2,000 fpm.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. C&R Sheet Metal, Ductmate, DuctSox Corporation, Eastern Sheet Metal, Euro-Aire, Fabricair, FlexmasterUSA, KE Fibertec, Lindab, Nordfab, Prihoda, Turnkey or Hamlin.

2.2 MATERIALS

A. General: Non-combustible or conforming to requirements for Class 1 air duct materials, or UL 181.

B. All duct material and covering shall have a flame spread rating of 24 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84.

C. Steel Ducts: ASTM A653/A653M galvanized steel sheet, lock forming quality, having zinc coating of 1.25 oz. Per sq. ft. for each side in conformance with ASTM G90.

D. Duct Schedule:

1. Supply, Return, Exhaust and Outside Air Ducts connected to Fan Coil Units, Furnaces, Heat Pumps, Variable Air Volume Box (VAV box outlet to grille, register, diffuser) and Terminal Units:

a. Pressure Class (Low Pressure): Positive 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 16.

d. SMACNA Leakage Class for Round and Flat Oval: 8.

2. All other ducts not listed above:

a. Pressure Class (Low Pressure): Positive 2-inch wg.

b. Minimum SMACNA Seal Class: C.

c. SMACNA Leakage Class for Rectangular: 16.

d. SMACNA Leakage Class for Round and Flat Oval: 8.

E. Flexible Ducts: Interlocking spiral of galvanized steel, or fabric supported on helically wound spring steel wire rated to 2 inches WG positive and 1.5 inches WG negative for low pressure ducts and 15 inches positive or negative for medium high-pressure ducts. Flexible ducts shall conform to UL 181. Maximum length per run shall be 48".

F. Insulated Flexible Duct: Flexible duct wrapped with flexible glass fiber insulation, enclosed by seamless aluminum pigmented plastic vapor barrier jacket; maximum 0.23 K value at 75 degrees F. Maximum length per run shall be 48".

G. Fasteners: Rivets, bolts, or sheet metal screws.

H. Sealant: Non-hardening, water resistant, fire resistive, compatible with mating materials; liquid used along or with tape, or heavy mastic.

I. Hanger Rod: Steel, galvanized; threaded both ends, threaded one end, or continuously threaded. Stainless steel for stainless steel duct.

2.3 INSULATION

A. Internal: Glass fiber; ASTM C1071, G21 and G22 with an NRC not less than .65, 1.5 lb./.cu. ft. minimum density; smooth black matted air side surface for maximum 5000 FPM air velocity.

B. External (choose one of the following):

1. Flexible or rigid glass fiber; ASTM C1290 and C1136 all-service duct wrap; K value of .27 at 75 degrees F and a minimum installed R-value of R-6. Provide with foil scrim facing.

2. Reflectix (or equal) R-6.0 insulation having two layers of aluminum foil with polyethylene bonded for strength, and two inner layers of insulated bubbles; 5/16” thick; 1.25 oz./sq. ft. Flame and smoke 25/50.

C. Insulation material and jackets shall have a flame spread rating of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84.

D. Adhesives: Waterproof fire-retardant tape.

E. Lagging Adhesives: Fire resistive to ASTM E84, NFPA 255, UL723.

F. Impale Anchors: Galvanized steel, 12- gage, spot welded or self-adhesive pad. No anchors shall penetrate duct walls.

G. Joint Tape: Glass fiber cloth, open mesh.

H. Tie Wire: Annealed steel, 16-gage.

2.4 DUCT HANGERS

A. All duct hangers in direct contact with galvanized duct shall be galvanized steel.

PART 3 - EXECUTION

3.1 LOW PRESSURE DUCTWORK

A. Fabricate and support in complete accordance with SMACNA HVAC Duct Construction Standards, Metal and Flexible and ASHRAE handbooks latest editions, except as indicated. Provide duct material, gages, reinforcing, and sealing for operation pressures indicated.

B. Size round ducts installed in place of rectangular ducts in accordance with ASHRAE table of equivalent rectangular and round ducts. No variation of duct configuration or sizes permitted except by written permission.

C. Construct T's, bends, and elbows with a radius of not less than 1-1/2 times width of duct on centerline. Where not possible and where rectangular elbows are used, provide turning vanes. Where acoustical lining is indicated, provide turning vanes of perforated metal with glass fiber insulation fill.

D. Increase duct sizes gradually, not exceeding 15 degrees divergence wherever possible. Divergence upstream of equipment shall not exceed 30 degrees; convergence downstream shall not exceed 30 degrees.

E. 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.

F. Connect flexible ducts to metal ducts with draw bands or adhesive plus sheet metal screws.

G. Use crimp joints with or without bead for joining round duct sizes 8 inch and smaller with crimp in direction of air flow.

3.2 INSULATION INSTALLATION

A. Install materials in accordance with manufacturer's instructions.

B. Exterior Insulation Application

1. Secure insulation with vapor barrier with wires and seal jacket joints with vapor barrier adhesive or tape to match jacket.

2. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.

3. Continue insulation with vapor barrier though penetrations.

C. Internal Application

1. Adhere insulation with adhesive for 100 percent coverage. Secure insulation with mechanical fasteners on 15-inch centers maximum on top and side of ductwork

with dimension exceeding 20 inches. Seal and smooth joints. DO not use nail-type fasteners. Seal vapor barrier penetrations by mechanical fasteners with vapor barrier adhesive.

2. Ductwork dimensions indicated are net inside dimensions required for air flow. Increase ductwork to allow for insulation thickness.

D. Insulation Schedule

1. Supply, return, and outside air ductwork shall be insulated with external insulation as noted below.

2. Ductwork listed below that is to be externally insulated:

a. All supply, return and outside air ductwork shall be externally insulated unless otherwise noted.

3. Externally insulated ductwork shall be insulated using one of the following methods:

a. Ductwork shall be externally insulated with Reflectix (or equal) R-6.0 insulation having two layers of aluminum foil with polyethylene bonded for strength, and two inner layers of insulated bubbles; 5/16” thick; 1.25 oz./sq. ft. Flame and smoke 25/50.

i) Ductwork may also be insulated with fiberglass insulation, maintaining the insulation value of R-6.0, in lieu of Reflectix insulation.

4. Insulation must be installed in strict accordance with insulation manufacturer's requirements. Provide spacers, pins, bands and adhesive as required. Special care must be taken on large ductwork to prevent sagging of insulation away from ductwork.

5. Interior exhaust duct shall not require insulation

6. Where duct is scheduled to be insulated (either externally or internally) herein and shown to be routed in an area that will be exposed based on Architectural drawings, the Contractor shall provide double-wall duct conforming with the specifications provided herein.

7. All ductwork insulation must conform to the minimum requirements of ASHRAE 90.1 (current edition) and International Energy Conservation Code (current edition) unless otherwise specified in this section.

3.3 HANGERS

A. Duct hangers may be directly attached to ducts. Ducts shall be hung by angles or straps as listed in the following schedule. Rods, straps or angles may be used in trapeze hangers. Hangers shall be in accordance with the following schedule, except that there shall be no less than one set of hangers for each section of ductwork. Where elbows or tees are installed for changes in direction, hangers shall be provided. No ductwork shall rest on the building structural system. No ductwork shall be supported by suspended ceiling systems. All ductwork must be independently supported from building structural system.

B. Where trapeze hangers are used, the bottom of the duct shall be supported to angle sized as follows (for round ducts, the angle shall conform to the bottom 120 degrees of the duct):

Diameter of Duct	Width of Duct	Bottom Angle Sizes
0"-32"	0"-30"	1" x 1" x 1/8"
35" and Larger	31" - 48"	1-1/2" x 1-1/2" x 1/8"

C. All hangers shall be sufficiently across-braced to eliminate, in the opinion of the Architect, excessive sway. Wherever ductwork contains filter sections, coils, fans or other heavy equipment (excluding registers, grilles, diffusers, splitter dampers, etc.) such equipment shall be hung independently of the ductwork, with rods or angles of sizes adequate to support the load.

D. Special Duct Hanging Conditions

1. In the event ductwork interferes with suspended ceiling support hangers, provide cross members from hangers affected. These cross members shall be of reinforcing steel or furring channels and shall run under ductwork in question from which additional ceiling hangers shall be supported.

END OF SECTION 23 31 13

SECTION 23 33 00 – DUCTWORK ACCESSORIES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Volume Control Dampers

B. Backdraft Dampers

C. Air Turning Devices

D. Flexible Duct Connectors

E. Duct Access Doors

F. Duct Test Holes

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - General Provisions for Mechanical Work

C. Section 233113 – Ductwork and Ductwork Insulation

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product specified.

PART 2 - PRODUCTS

2.1 VOLUME CONTROL DAMPERS

A. Acceptable Manufacturers

1. United Enertech, Air Balance, American Warming, Arrow, Cesco, Creative Metals, Nailor, Ruskin, Vent Products, and Whiz Air.

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

C. Fabricate splitter dampers of material same gage as duct to 24 inches size in either direction and two gages heaver for sizes over 24 inches.

D. Fabricate splitter dampers to streamline shape. Secure blade with continuous hinge or rod. Operate with minimum 1/4-inch diameter rod in self-aligning, universal joint action flanged bushing with set screw.

E. Fabricate single blade dampers for duct sizes to 12 inch.

F. Fabricate multi-blade damper of opposed blade pattern with maximum blade sizes 12 x 72 inches. Assemble center and edge crimped blades in prime coated or galvanized channel frame with suitable hardware.

G. Except in round ductwork 12 inches and smaller, provide end bearings. On multiple blade dampers, provide oil-impregnated nylon or sintered bronze bearings.

H. Provide locking, indicating quadrant regulators on single and multi-blade dampers. Where rod lengths exceed 30 inches provide regulator at both ends.

I. Where ductwork is required to have external insulation wrap applied, dampers shall be provided with 2” stand-off (minimum) to allow full range of motion of damper handle without damage to surrounding insulation.

2.2 BACKDRAFT DAMPERS

A. Acceptable Manufacturers

1. United Enertech, Air Balance, Arrow, Cesco, Nailor, Ruskin, and Vent Products.

B. Gravity backdraft dampers, size 18 x 18 inches or smaller, furnished with air moving equipment, may be air moving equipment manufacturers standard construction.

C. Fabricate multi-blade, parallel action gravity balanced backdraft dampers of 16 gage galvanized steel, with center pivoted blades of maximum 6-inch width, with felt or flexible vinyl sealed edges, linked together in rattle-free manner with 90 degree stop, steel ball bearings, and plated steel pivot pin; adjustment device to permit setting for varying differential static pressure.

2.3 AIR TURNING DEVICES

A. Acceptable Manufacturers

1. Ductmate Industries, Duro-Dyne, Metalaire, Semco, Ward Industries.

B. Multi-blade device with blades aligned in short dimension; steel or aluminum construction; with individually adjustable blades, mounting straps. Provide in all square turns.

2.4 FLEXIBLE DUCT CONNECTORS

A. Acceptable Manufacturers

1. Ductmate Industries, Duro-Dyne, Vent Fabrics, Ward Industries.

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards, and as indicated.

C. UL listed fire-retardant neoprene coated woven glass fiber fabric to NFPA 90A, minimum density 20 oz per square yard, approximately 6 inches wide, crimped into metal edging strip.

2.5 DUCT ACCESS DOORS

A. Acceptable Manufacturers

1. American Warming, Cesco, Ductmate Industries, Kees, Safe Air/Dowco, Vent Fabrics

B. Fabricate in accordance with SMACNA Low Pressure Duct Construction Standards and as indicated.

C. Fabricate rigid and close-fitting doors of galvanized steel with sealing gaskets and quick fastening locking devices. For insulated ductwork, install minimum one-inch thick insulation with sheet metal cover.

D. Access doors smaller than 12 inches square may be secured with sash locks.

E. Provide two hinges and two sash locks for sizes up to 18 inches square, three hinges and two compression latches with outside and inside handles for sizes up to 24 x 48 inches. Provide an additional hinge for larger sizes.

F. Access doors with sheet metal screw fasteners are not acceptable.

G. Fire and Smoke Damper Access: Ductwork serving dampers 12”x12” and 12” diameter inside clear dimension and smaller, Rectangular and round, to be provided with a

removable ductwork section for damper inspection and maintenance. Removable ductwork section to function without the use of tools.

2.6 DUCT TEST HOLES

A. Cut or drill temporary test holes in ducts as required. Cap with neat patches, neoprene plugs, threaded plugs, or threaded or twist-on metal caps.

B. Permanent test holes shall be factory fabricated, airtight flanged fittings with screw cap. Provide extended neck fittings to clear insulation.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install accessories in accordance with manufacturer's instructions.

B. Provide balancing dampers at points on low pressure supply, return, and exhaust systems where branches are taken from larger ducts as required for air balancing. Use splitter dampers where required.

C. Provide backdraft dampers on exhaust fans or exhaust ducts nearest to outside and where indicated.

D. Provide flexible connections immediately adjacent to equipment in ducts associated with fans and motorized equipment.

E. Provide duct access doors for inspection and cleaning before and after filters, coils, fans, automatic dampers, at fire dampers, and elsewhere as indicated. Provide minimum 8 x 8-inch size for hand access, 18 x 18-inch size for shoulder access, and as indicated.

F. Provide duct test holes where indicated and required for testing and balancing purposes.

END OF SECTION 23 33 00

SECTION 23 34 23 – POWER VENTILATORS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Ceiling Exhaust Fans

B. Attic Ventilation Fans

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 230529 - SUPPORTS AND ANCHORS FOR HVAC PIPING AND EQUIPMENT

D. Section 230548 - VIBRATION ISOLATION FOR HVAC EQUIPMENT AND PIPING

E. Section 233113 – DUCTWORK AND DUCTWORK INSULATION

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.

a. Construction details, material descriptions, dimensions of individual components and profiles, and finishes for fans.

b. Rated capacities, operating characteristics, and furnished specialties and accessories.

c. Certified fan performance curves with system operating conditions indicated.

d. Certified fan sound-power ratings.

e. Motor ratings and electrical characteristics, plus motor and electrical accessories.

f. Material thickness and finishes, including color charts.

g. Dampers, including housings, linkages, and operators.

h. Prefabricated roof curbs.

i. Fan speed controllers.

j. Wiring Diagrams: For power, signal, and control wiring.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For all fans and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For fans to include in operation, and maintenance manuals.

1.5 REFERENCES

A. AMCA 99 - Standards Handbook.

B. AMCA 210 - Laboratory Methods of Testing Fans for Rating Purposes.

C. AMCA 300 - Test Code for Sound Rating Air Moving Devices.

D. AMCA 301 - Method of Publishing Sound Ratings for Air Moving Devices.

E. SMACNA - Low Pressure Duct Construction Standard.

1.6 QUALITY ASSURANCE

A. Performance Ratings: Conform to AMCA 210.

B. Sound Ratings: AMCA 301, tested to AMCA 300.

C. Fabrication: Conform to AMCA 99.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Acme Engineering & Manufacturing Corp.
2. Aerovent; a division of Twin City Fan Companies, Ltd.
3. Broan
4. Carnes Company.
5. CaptiveAire.
6. Greenheck Fan Corporation.
7. JencoFan.
8. Loren Cook Company.
9. PennBarry.
10. S & P USA Ventilation Systems, LLC.

2.2 GENERAL

A. Provide all fans with disconnect.

B. Provide all fans with motor starters. See Section 230100 for details.

C. Integral phase relay shall be provided as a part of all three phase motor starters. Relay shall shut motor down on phase loss or phase unbalance and automatically reset when normal phasing is restored. Phase failure relay shall have adjustable restart time capabilities. Mechanical contractor shall coordinate staggered restart times as required.

2.3 ATTIC EXHAUST FAN

A. Attic exhaust fan dome to be ultraviolet resistant plastic or .050, 18 gauge aluminum dome. Motor to be thermally protected and permanently lubricated. RPM not to exceed 1000 RPM. Fan to have built-in adjustable thermostat for automatic operation at adjustable temperature setpoint.

2.4 CEILING EXHAUST FANS

A. Centrifugal Fan Unit: V-belt or direct drive as specified, with galvanized steel housing lined with 1/2-inch acoustic insulation resilient mounted motor, gravity backdraft damper in discharge.

B. Disconnect Switch: Factory wired, non-fusible, in housing for thermal overload protected motor and wall mounted multiple speed switch/solid state speed controller.

C. Grille: Molded white plastic or aluminum with baked white enamel finish.

D. Sheaves: Cast iron or steel, dynamically balanced, bored to fit shafts and keyed, variable and adjustable pitch motor sheaves selected so required rpm is obtained with sheaves set at mid-position, fan shaft with self-aligning pre-lubricated ball bearings.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install equipment in a manner to provide required clearances for proper operation and maintenance.

C. For roof mounted fans, secure roof exhausters with lag screws to roof curb.

END OF SECTION 23 34 23

SECTION 23 37 13 – AIR DISTRIBUTION DEVICES

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Diffusers

B. Registers/grilles

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 – GENERAL PROVISIONS FOR MECHANICAL WORK

C. Section 233113 – DUCTWORK AND DUCTWORK INSULATION

D. Section 233300 - DUCTWORK ACCESSORIES

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product indicated.

a. Data Sheet: Indicate materials of construction, finish, and mounting details; and performance data including throw and drop, static pressure drop, and noise ratings.

b. Diffuser Schedule: Indicate drawing designation, room location, quantity, model number, size, and accessories furnished.

1.4 REFERENCES

A. ADC 1062 - Certification, Rating and Test Manual.

B. AMCA 500 - Test Method for Louvers, Dampers and Shutters.

C. ANSI/NFPA 90A - Installation of Air Conditioning and Ventilating Systems.

D. ARI 650 - Air Outlets and Inlets.

E. ASHRAE 70 - Method of Testing for Rating the Air Flow Performance of Outlets and Inlets.

F. SMACNA - Low Pressure Duct Construction Standard.

1.5 QUALITY ASSURANCE

A. Test and rate performance of air outlets and inlets in accordance with ADC Equipment Test Code 1062 and ASHRAE 70.

B. Test and rate performance of louvers in accordance with AMCA 500.

1.6 REGULATORY REQUIREMENTS

A. Conform to ANSI/NFPA 90A.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Manufacturer listed in schedule is for design selection only.

B. Registers, Grilles, and Diffusers

1. Anemostat, Carnes, Hart and Cooley, Krueger, Metalaire, Price, Titus, Tuttle and

2.2 WALL SUPPLY REGISTERS/GRILLES

A. Streamlined and individually adjustable blades, depth of which exceeds 3/4 inch with adjustable blades, vertical, horizontal face, and horizontal rear deflectors.

B. Fabricate margin frame with countersunk screw or concealed mounting and gasket suitable for surface or duct mounting.

C. Fabricate of steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory baked enamel finish.

D. Provide integral, gang-operated opposed blade dampers with removable key operator, operable from face.

2.3 WALL EXHAUST AND RETURN REGISTERS/GRILLES

A. Streamlined blades, fixed, non-adjustable, horizontal face.

B. Fabricate margin frame with countersunk screw or concealed mounting.

C. Fabricate of steel with 20 gage minimum frames and 22 gage minimum blades, steel and aluminum with 20 gage minimum frame, or aluminum extrusions, with factory baked enamel finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Furnish and install where shown on drawings all registers, grilles, diffusers and louvers in accordance with the tabulation in the schedule on drawings.

B. Provide accessories and modifications as indicated in schedule notes.

C. Install items in accordance with manufacturer’s instructions.

D. Install in locations as shown on drawings. Items have been located as shown to provide maximum performance. Coordinate with architectural features and notify Architect/Engineer of any conflicts.

E. Install diffusers to ductwork with airtight connection.

F. Provide accessible balancing dampers on duct take-off to diffusers, and grilles and registers, regardless of whether dampers are specified as part of the diffuser, or grille and register.

END OF SECTION 23 37 13

SECTION 23 41 00 – PARTICULATE AIR FILTRATION

PART 1 - GENERAL

1.1 WORK INCLUDED

A. 30% efficient throwaway filters.

B. Filter frames

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 230100 - GENERAL PROVISIONS FOR MECHANICAL WORK

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product. Include dimensions; operating characteristics; required clearances and access; rated flow capacity, including initial and final pressure drop at rated airflow; efficiency and test method; fire classification; furnished specialties; and accessories for each model indicated.

2. Where applicable provide filter rack assembly, dimensions, materials, and methods of assembly of components.

1.4 CLOSEOUT DOCUMENTS

A. Operation and Maintenance Data: For list of all filters (size and number) required and associated air handling equipment in operation and maintenance manuals.

1.5 REFERENCES

A. ANSI/UL 586 - Test Performance of High Efficiency Particulate, Air Filter Units.

B. ANSI/UL 900 - Test Performance of Air Filter Units.

C. ASHRAE 52 - Method of Testing Air Cleaning Devices Used in General Ventilation for Removing Particulate Matter.

1.6 QUALITY ASSURANCE

A. Filter media shall be ANSI/UL 900 listed, Class 1 or Class 2, as approved by local authorities.

B. Provide all filters as product of one manufacturer.

C. Assemble filter components to form filter banks from products of one manufacturer.

1.7 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 220100.

B. Include instructions for operation, changing, and periodic cleaning.

1.8 STOCK AND EXTRA STOCK

A. Throwaway filters (ducted equipment):

1. Provide one set of 30% efficient pleated filters for all equipment utilizing filters. The contractor shall be responsible for changing the air filters once the equipment has been started until substantial completion of the entire project. During this period,

filters shall be changed every 30 days with dated specified filters. New dated filters shall be installed when the systems are balanced. One complete set of filters shall be turned over to the owner at substantial completion of the entire project as a spare set. See specific specification sections regarding equipment requiring filters.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. FARR, American Air Filter, Airguard, Tri-Dim Filter Corporation.

2.2 PLEATED AIR FILTERS

A. Air filters shall be medium efficiency, pleated, disposable type. Each filter shall consist of a non-woven cotton and synthetic fabric media, media support grid and enclosing frame. The filter shall be listed by Underwriters' Laboratories as Class 2.

B. Filter media shall be the non-woven cotton fabric type. The filter media shall have an average efficiency of 25-30% on ASHRAE Test Standard 52-76. It shall have an average arrestance of 90-92% in accordance with that test standard.

C. The media support shall be a welded wire grid with an effective open area of not less than 96%.

1. The welded wire grid shall be bonded to the filter media to eliminate the possibility of media oscillation and media pull away.

2. The media support grid shall be formed in such a manner that it effects a radial pleat design, allowing total use of filter media.

D. The enclosing frame shall be constructed of a rigid, heavy-duty, high wet-strength beverage board, with diagonal support members bonded to the air entering and air exit side of each pleat, to ensure pleat stability. The inside periphery of the enclosing frame shall be bonded to the filter pack, thus, eliminating the possibility of air bypass.

2.3 FILTER FRAMES

A. Description: Factory-assembled, side-service housings, constructed of galvanized steel, with flanges to connect to duct or casing system.

B. Approved manufacturers:

1. AAF International

2. Camfil Farr

3. Flanders Corporation

4. Koch Filter Corporation

C. Source Limitations: Obtain from single source from single manufacturer.

D. Access Doors: Hinged, with continuous gaskets on perimeter and positive-locking devices or magnetic closure and arranged so filter cartridges can be loaded from either access door.

E. Sealing: Incorporate positive-sealing gasket material on channels to seal top and bottom of filter cartridge frames and to prevent bypass of unfiltered air.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install air cleaning devices in accordance with manufacturer's instructions.

B. Do not operate fan system until filters (temporary or permanent) are in place. Replace temporary filters used during construction.

C. Install all filter frames in a manner to allow replacement without interference of any other system or component.

END OF SECTION 23 41 00

SECTION 23 54 16.13 – GAS-FIRED FURNACES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Gas-fired, noncondensing condensing furnaces and accessories complete with controls.
2. Air filters.
3. Refrigeration components. (Indoor cooling coil & exterior air-cooled condensing unit).

1.2 RELATED DOCUMENTS

A. The General and Special Conditions, Division 01 Specification Sections, and all other Contract Documents (ESPECIALLY DIVISIONS 21, 22, 23 AND 26) are applicable to work under this section of the specifications. All the work under this section of the specifications shall be governed by any alternates and unit prices called for in the FORM OF PROPOSAL insofar as they affect this portion of the work.

B. Section 220100 - GENERAL PROVISION FOR MECHANICAL WORK

C. See drawings for further conditions, requirements, and schedules.

1.3 ACTION SUBMITTALS

A. Shop Drawings:

1. Product Data: For each type of product.
   a. Include rated capacities, operating characteristics, furnished specialties, and accessories.
   b. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.

1.4 CLOSEOUT SUBMITTALS

A. Approved Shop Drawings: For each furnace and related components. Provide in operation and maintenance manual.

B. Operation and Maintenance Data: For each furnace to include in operation and maintenance manuals.

1.5 QUALITY ASSURANCE

A. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

B. ASHRAE/IES 90.1 Compliance: Applicable requirements in ASHRAE/IES 90.1, Section 6 - "Heating, Ventilating, and Air-Conditioning."

C. Comply with NFPA 70.

1.6 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace the following components of furnaces that fail in materials or workmanship within specified warranty period:

1. Warranty Period, Commencing on Date of Substantial Completion:
   a. Furnace Heat Exchanger: 20 years.

b. Integrated Ignition and Blower Control Circuit Board: Five years.

c. Draft-Inducer Motor: Five years.

d. Refrigeration Compressors: 5 years.

e. Evaporator and Condenser Coils: Five years.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Daikin, Carrier, Lennox, Trane

2.2 GAS-FIRED FURNACES, NONCONDENSING

A. Cabinet: Steel.

1. Cabinet interior around heat exchanger shall be factory-installed insulation.

2. Lift-out panels shall expose burners and all other items requiring access for maintenance.

3. Factory paint external cabinets in manufacturer's standard color.

4. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

B. Fan: Centrifugal, factory balanced, resilient mounted, direct drive.

1. Special Motor Features: Multi-tapped, multispeed with internal thermal protection and permanent lubrication.

2. Special Motor Features: Electronically controlled motor (ECM) controlled by integrated furnace/blower control.

C. Type of Gas: Natural.

D. Heat Exchanger: Stainless steel.

E. Burner:

1. Gas Valve: 100 percent safety two-stage main gas valve, main shutoff valve, pressure regulator, safety pilot with electronic flame sensor, limit control, transformer, and combination ignition/fan timer control board.

2. Ignition: Electric pilot ignition, with hot-surface igniter or electric spark ignition.

F. Gas-Burner Safety Controls:

1. Electronic Flame Sensor: Prevents gas valve from opening until pilot flame is proven; stops gas flow on ignition failure.

2. Flame Rollout Switch: Installed on burner box; prevents burner operation.

3. Limit Control: Fixed stop at maximum permissible setting; de-energizes burner on excessive bonnet temperature; automatic reset.

G. Combustion-Air Inducer: Centrifugal fan with thermally protected motor and sleeve bearings pre-purges heat exchanger and vents combustion products; pressure switch prevents furnace operation if combustion-air inlet or flue outlet is blocked.

H. Furnace Controls: Solid-state board integrates ignition, heat, cooling, and fan speeds; and adjustable fan-on and fan-off timing; terminals for connection to accessories.

I. Vent Materials: Type B metal vent.

2.3 GAS-FIRED FURNACES, CONDENSING

A. Cabinet: Steel.

1. Cabinet interior around heat exchanger shall be factory-installed insulation.
2. Lift-out panels shall expose burners and all other items requiring access for maintenance.
3. Factory paint external cabinets in manufacturer's standard color.
4. Airstream Surfaces: Surfaces in contact with the airstream shall comply with requirements in ASHRAE 62.1.

B. Fan: Centrifugal, factory balanced, resilient mounted, direct drive.

1. Special Motor Features: Multi-tapped, multispeed with internal thermal protection and permanent lubrication.
2. Special Motor Features: Electronically controlled motor (ECM) controlled by integrated furnace/blower control.

C. Type of Gas: Natural.

D. Heat Exchanger:

1. Primary: Stainless steel.
2. Secondary: Stainless steel.

E. Burner:

1. Gas Valve: 100 percent safety modulating main gas valve, main shutoff valve, pressure regulator, safety pilot with electronic flame sensor, limit control, transformer, and combination ignition/fan timer control board.
2. Ignition: Electric pilot ignition, with hot-surface igniter or electric spark ignition.

F. Gas-Burner Safety Controls:

1. Electronic Flame Sensor: Prevents gas valve from opening until pilot flame is proven; stops gas flow on ignition failure.
2. Flame Rollout Switch: Installed on burner box; prevents burner operation.
3. Limit Control: Fixed stop at maximum permissible setting; de-energizes burner on excessive bonnet temperature; automatic reset.

G. Combustion-Air Inducer: Centrifugal fan with thermally protected motor and sleeve bearings pre-purges heat exchanger and vents combustion products; pressure switch prevents furnace operation if combustion-air inlet or flue outlet is blocked.

H. Furnace Controls: Solid-state board integrates ignition, heat, cooling, and fan speeds; adjustable fan-on and fan-off timing; terminals for connection to accessories.

I. Accessories:

1. Combination Combustion-Air Intake and Vent: PVC plastic fitting to combine combustion-air inlet and vent through outside wall or roof as specified.
2. CPVC Plastic Vent Materials:
    a. CPVC Plastic Pipe: Schedule 40, complying with ASTM F 441/F 441M.
    b. CPVC Plastic Fittings: Schedule 40, complying with ASTM F 438, socket type.
    c. CPVC Solvent Cement: ASTM F 493.
3. PVC Plastic Vent Materials:
    a. PVC Plastic Pipe: Schedule 40, complying with ASTM D 1785.

b. PVC Plastic Fittings: Schedule 40, complying with ASTM D 2466, socket type.

c. PVC Solvent Cement: ASTM D 2564.

2.4 THERMOSTATS

A. Controls shall comply with requirements in ASHRAE/IES 90.1, "Controls."

B. Solid-State Thermostat: Wall-mounted, programmable, microprocessor-based unit with automatic switching from heating to cooling, preferential rate control, seven-day programmability with minimum of four temperature presets per day and battery backup protection against power failure for program settings.

2.5 AIR FILTRATION SECTION

A. General Requirements for Air Filtration Section:

1. Comply with NFPA 90A.

2. Minimum MERV according to ASHRAE 52.2.

3. Filter-Holding Frames: Arranged for flat or angular orientation, with access doors on both sides of unit. Filters shall be removable from one side or lifted out from access plenum.

B. Disposable Panel Filters:

1. Factory-fabricated, viscous-coated, flat-panel type.

2. Thickness: 1 inch.

3. Media: Interlaced glass fibers sprayed with nonflammable adhesive and antimicrobial agent.

2.6 REFRIGERATION COMPONENTS

A. General Refrigeration Component Requirements:

1. Refrigeration compressor, coils, and specialties shall be designed to operate with CFC-free refrigerants.

2. Energy Efficiency: Equal to or greater than prescribed by ASHRAE/IES 90.1.

B. Refrigerant Coil: Copper tubes mechanically expanded into aluminum fins and thermal-expansion valve. Comply with AHRI 210/240. Match size with furnace. Include condensate drain pan with accessible drain outlet complying with ASHRAE 62.1.

1. Refrigerant Coil Enclosure: Steel, matching furnace and evaporator coil, with access panel and flanges for integral mounting at or on furnace cabinet and galvanized sheet metal drain pan coated with black asphaltic base paint.

2. Condensate Overflow Switch

C. Refrigerant Line Kits: Annealed-copper suction and liquid lines factory cleaned, dried, pressurized with nitrogen, sealed, and with suction line insulated. Provide in standard lengths for installation without joints, except at equipment connections.

1. This piping shall be capped throughout the construction to prevent any foreign materials from entering the piping. Fittings shall be wrought copper solder joint type. Dry nitrogen shall be bled through piping while joints are being brazed. Joints shall be as follows:

a. Copper to Brass - Silver Solder.

b. Copper to Copper - Silfos.

2. Joints: Copper tubing connections shall be made up with 95/5 tin antimony solder or silfos, in accordance with the recommendations of the manufacturer or as specified hereinafter.

3. Refrigerant Piping Insulation: Armstrong Armaflex insulation ½" thick with fittings covered with mitered sections of insulation and sealed with 520 adhesive. All insulation on outdoor installation shall be additionally protected with two (2) coats of Armaflex vinyl-lacquer type finish.

   a. Comply with ASTM C 534/C 534M, Type I.

4. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534/C 534M, Type I, 1 inch thick.

D. Air-Cooled Compressor-Condenser Unit:

1. Casing: Steel, finished with baked enamel, with removable panels for access to controls, weep holes for water drainage, and mounting holes in base. Provide brass service valves, fittings, and gage ports on exterior of casing.

2. Compressor: Hermetically sealed scroll type.

   a. Crankcase heater.

   b. Vibration isolation mounts for compressor.

   c. Compressor motor shall have thermal- and current-sensitive overload devices, start capacitor, relay, and contactor.

   d. Two-speed compressor motors shall have manual-reset high-pressure switch and automatic-reset low-pressure switch.

   e. Refrigerant: R-410A.

3. Refrigerant Coil: Copper tube, with mechanically bonded aluminum fins, complying with AHRI 210/240, and with liquid sub-cooler.

4. Fan: Aluminum-propeller type, directly connected to motor.

5. Motor: Permanently lubricated, with integral thermal-overload protection.

6. High- and Low-Pressure switches.

7. High capacity liquid air drier.

8. Low Ambient Kit: Permits operation down to 45 deg F.

E. Condensate Drain

1. Furnace and coil condensate drains shall be schedule 40 PVC, ASTM-D1784.

2. Fittings: PVC, ASTM D-1785 and 2466.

3. Joints: Solvent weld.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Examine factory-installed insulation before furnace installation. Reject units that are wet, moisture damaged, or mold damaged.

C. Examine roughing-in for gas and refrigerant piping systems to verify actual locations of piping connections before equipment installation.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install gas-fired furnaces and associated fuel and vent features and systems according to NFPA 54.

B. Suspended Units: Suspend from structure using threaded rods, spring hangers, and building attachments. Secure rods to unit hanger attachments. Adjust hangers so unit is level and plumb.

1. Install seismic restraints to limit movement of furnace by resisting code-required seismic acceleration.

C. Base-Mounted Units: Secure units to substrate. Provide optional bottom closure base if required by installation conditions.

1. Anchor furnace to substrate to resist code-required seismic acceleration.

D. Controls: Install thermostats at mounting height of 48 inches above floor.

E. Wiring Method: Install control wiring in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Conceal control wiring except in unfinished spaces.

F. Install ground-mounted, compressor-condenser components on 4-inch thick, reinforced concrete base; 4 inches larger on each side than unit.

G. Install roof-mounted compressor-condenser components on equipment supports as specified. Anchor units to supports with removable, cadmium-plated fasteners.

3.3 CONNECTIONS

A. Gas piping installation requirements are specified in Section 221000 "Plumbing Piping and Valves." Drawings indicate general arrangement of piping, fittings, and specialties. Connect gas piping with union or flange and appliance connector valve.

B. Install piping adjacent to equipment to allow service and maintenance.

C. Vent Connection, Noncondensing, Gas-Fired Furnaces: Connect Type B vents to furnace vent connection and extend outdoors.

D. Vent and Outside-Air Connection, Condensing, Gas-Fired Furnaces: Connect plastic piping vent material to furnace connections and extend outdoors. Terminate vent outdoors with a cap and in an arrangement that will protect against entry of birds, insects, and dirt.

1. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

2. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

3. Plastic Piping Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:

a. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements.

b. CPVC Piping: Join according to ASTM D 2846/D 2846M, Appendix.

c. PVC Pressure Piping: Join schedule number ASTM D 1785 PVC pipe and PVC socket fittings according to ASTM D 2672. Join other-than-schedule-number PVC pipe and socket fittings according to ASTM D 2855.

4. Slope pipe vent back to furnace or to outside terminal.

E. Connect ducts to furnace with flexible connector. Comply with requirements in Section 233300 "Ductwork Accessories."

F. Connect refrigerant tubing kits to refrigerant coil in furnace and to air-cooled compressor-condenser unit.

1. Flared Joints: Use ASME B16.26 fitting and flared ends, following procedures in CDA's "Copper Tube Handbook."

2. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

3. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8/A5.8M.

3.4 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Perform electrical test and visual and mechanical inspection.

2. Leak Test: After installation, charge systems with refrigerant and test for leaks. Repair leaks, replace lost refrigerant, and retest until no leaks exist.

3. Operational Test: After electrical circuitry has been energized, start units to confirm proper operation, product capability, and compliance with requirements.

4. Verify that fan wheel is rotating in the correct direction and is not vibrating or binding.

5. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Verify that vibration isolation and flexible connections properly dampen vibration transmission to structure.

3.5 STARTUP SERVICE

A. Complete installation and startup checks according to manufacturer's written instructions and perform the following:

1. Inspect for physical damage to unit casings.

2. Verify that access doors move freely and are weathertight.

3. Clean units and inspect for construction debris.

4. Verify that all bolts and screws are tight.

5. Adjust vibration isolation and flexible connections.

6. Verify that controls are connected and operational.

B. Adjust fan belts to proper alignment and tension.

C. Start unit according to manufacturer's written instructions and complete manufacturer's operational checklist.

D. Measure and record airflows.

E. Verify proper operation of capacity control device.

F. After startup and performance test, lubricate bearings.

3.6 ADJUSTING

A. Adjust initial temperature set points.

B. Set controls, burner, and other adjustments for optimum heating performance and efficiency. Adjust heat-distribution features, including shutters, dampers, and relays, to provide optimum heating performance and system efficiency.

3.7 CLEANING

A. After completing installation, clean furnaces internally according to manufacturer's written instructions.

B. Install new filters in each furnace within 14 days after Substantial Completion.

3.8 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain condensing units. Refer to Section 230600 "Mechanical Systems Demonstration and Training."

END OF SECTION 23 54 16.11

ELECTRICAL INDEX

SECTION NUMBER
DIVISION 26 – ELECTRICAL

SECTION 26 05 00 – GENERAL REQUIREMENTS

PART 1 - GENERAL

1.1 SUMMARY

A. All drawings and general provisions of the contract, including the General and Supplementary Conditions and Division 01 Specifications apply to all specifications in Divisions 26, 27 and 28. In addition, the general requirements described within this specification section, 260500 General Requirements, apply to all specifications in Division 26, 27, 28 and the Contract Drawings.

B. The contractor is responsible for obtaining and paying for all building permits, fees, licenses and inspections required by the governing agencies.

C. The drawings and specifications constitute the Contract Documents. They complement each other. All items shown on the drawings and/or listed in the specifications shall be provided and installed by the Contractor unless specifically noted that it will be provided and/or installed by others. In the event there is a conflict within the Contract Documents, the Contractor shall notify the Engineer immediately. If a clarification is not given, the Contractor shall bid the more stringent of the two requirements.

D. The Engineer does not define the scope of work for individual trades, subcontractors, material suppliers or vendors. Any sheet numbering system or reference to a specific trade in the contract documents is used solely for the Engineer's convenience and it is not intended to define a subcontractor's scope of work. It is the responsibility of any contractor, subcontractor, manufacturer or supplier preparing bids for this project to obtain and review the complete set of drawings and specifications.

E. Any materials, labor, equipment or services not specifically mentioned herein which may be necessary to complete any part of the electrical systems described in the drawings and/or specifications shall be included as part of the Contract.

F. References in the Contract Documents to any specific manufacturer and/or catalog numbers are intended to establish a standard of quality and not to limit competition. Proposed equivalent manufacturers shall be provided to the Engineer a minimum of 14 days prior to bid.

1. These references to a specific manufacturer and/or catalog number represent a 'basis-of-design.' The Engineer has used the specific characteristics of the basis-of-design product(s) in coordination with other trades. These characteristics include, but not limited to, the following: dimensions, weight, working clearances, and interconnections with other trades. If the contractor elects to provide alternative products to the basis-of-design with deviating characteristics affecting other trades, it is the contractor's responsibility to coordinate all modifications required by the alternative product(s) with all other trades involved and to provide complete and operational systems. Work required for the alternative product(s) that is above and beyond work required to install the basis of design shall be borne by the Contractor at no additional cost to the Owner.

G. All work performed in the Contract shall comply with all relevant codes adopted by the state and locality in which the project is located.

H. All electrical components, devices and accessories shall be listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

I. The drawings are diagrammatic only. It is the responsibility of this Contractor to coordinate the installation of the specified components with all other trades to accomplish the following:

J. Allow maximum possible headroom unless specific mounting heights that reduce headroom are indicated.

K. Provide for ease of disconnecting equipment with minimum interference with other installations.

L. Mount control panels, relay panels, VFD's, or similar, at locations where they are accessible without the use of a lift or ladder taller than 8 feet unless otherwise noted. Mount in mechanical rooms, or similar where possible. Provide additional local disconnect switch(es) as required where control panels, relay panels, VFD's, or similar are located remoted from the equipment served. Coordinate final locations with Architect/Engineer.

M. Allow right of way for piping and conduit installed at required slope, so connecting raceways, cables, wireways, cable trays and busways will be clear of obstructions and of the working and access space of other equipment.

N. All work shall be installed in a neat and workman like manner complying with standards in NECA1, Standard for Good Workmanship in Electrical Construction.

1.2 DIGITAL DATA AND FILE TRANSMISSION

A. Sub-Contractors (SC) requiring digital files to prepare shop drawings and governmental agency submittals shall make their request through the Construction Manager (CM) or General Contractor (GC).

1. The CM/GC shall compile a list of requested drawings from the respective SC's and submit one comprehensive list to STW.

2. STW will provide the CM/GC with a digital file transmission release form. The CM/GC may sign and return or have the requesting SC's sign and return to STW through the CM/GC.

3. After receiving the signed release form, STW will provide one set of all requested digital files to the CM/GC to then distribute to the appropriate SC's.

4. STW will provide AutoCAD/dwg files.

a. Revit/BIM models will not be provided to contractors. Projects completed using REVIT will be exported to AutoCAD prior to releasing.

B. The project architect is the owner/author of the floor plans and reflected ceiling plans.

1. The architect must approve the release of these plans before STW can release our respective drawings.

2. Requests for floor plans and/or reflected ceiling plans only shall be made directly to the architect.

1.3 WARRANTY

A. At a minimum the Contractor shall warranty all defects in material and labor for one year starting from the date of substantial completion. In the event of a multi-phased renovation, all warranty periods shall start on the date of substantial completion of the final phase. Additional warranties may be required and will be described within the associated specification section.

1.4 SHOP DRAWINGS

A. The Engineer's review is for general conformance with the design concept as it relates to the Engineer's scope of services. The contractor shall remain responsible for compliance with the project's contract drawings and specifications. Any markings, comments or lack of any notation on the returned submittals shall not be construed as relieving the contractor from this responsibility. Under no circumstances shall submittal and review of

the shop drawings be interpreted as acceptance of a modification or change to the contract documents. The contractor remains responsible for details and accuracy, for confirming and correlating all quantities and dimensions, and for performing its work in a safe manner.

B. The Contractor shall provide the Engineer with any and all product cutsheets, dimensioned drawings, wiring diagrams or any other documentation which may be required to describe the material to be provided as part of this Contract. Refer to the respective specification sections for additional requirements.

C. The Engineer requires a minimum of two (2) weeks to review shop drawings. The contractor shall account for this review time in the project schedule.

1. The contractor can notify the Engineer if there are specific shop drawings that require a quicker review time. The Engineer will make efforts to accommodate this request.

1.5 OPERATION AND MAINTENANCE MANUALS

A. Operation and maintenance manuals are NOT a copy of the shop drawings or equipment cutsheets. They are intended to be reference materials on how to operate and maintain equipment.

B. All information shall be type written and machine generated.

C. All information required to be included in the operation and maintenance manuals shall be provided in digital PDF format and with hard copies.

1. Hard copies shall be bound a hard cover three ring binder.

2. The binder shall be labeled on the cover of the spine with the following information:

a. Project Name

b. Date of Construction

c. Installing contractor’s name

d. Consultant’s name

D. Each manual shall contain the following:

1. A title page with the same information included on the binder cover.

2. A table of contents.

3. Dividers separating each section and labeled to correspond with the table of contents.

1.6 RECORD DRAWINGS

A. The contractor shall maintain one set of marked-up paper copies of the contract drawings and specifications for record documents.

1. Make marks using colored instruments. Do not use the color black or a lead pencil.

B. The set of drawings and specifications used for the record documents shall not be used in the field for construction purposes. The record documents shall be clean, dry, legible, and undamaged.

C. Mark the record drawings as necessary to incorporate the following:

1. Addendums which changed the original drawings.

2. Change orders, supplemental instructions or similar change directives that modify the contract drawings.

3. Any deviations from the contract drawings including locations of equipment and devices, and panel circuits.

4. Locations and depths of underground electrical installations located outside the building footprint.

    a. The contractor shall reference the dimensions of the installations from permanent structures and note on the record drawings.

D. Mark the record specifications as necessary to incorporate the following:

1. Addendums which changed the original specifications.

2. Change orders, supplemental instructions or similar change directives that modify the contract specifications.

E. Refer to the Division 1 specifications for additional record drawing requirements.

1.7 PUNCH LISTS

A. It is the responsibility of the contractor to notify the engineer when the contractor is ready for punch lists to be performed. The contractor shall notify the engineer a minimum of one week prior.

1. Above ceiling punch lists shall not be scheduled until the following have been completed, at a minimum. The following is not intended to be a comprehensive checklist:

    a. Ceiling grid installed.

    b. Light fixtures installed, wired and independently supported.

    c. Ceiling mounted devices installed and wired. Ceiling tiles may be installed where necessary for the installation of the devices.

    d. Low-voltage cabling installed and supported.

2. Above ceiling punches and back-checks shall occur prior to the installation of ceiling tiles. If ceiling tiles have been installed, it will be contractor’s responsibility to assist the engineer during the punch or back-check. The contractor shall provide a ladder, raise ceiling tiles and replace, in areas deemed necessary by the engineer.

B. The engineer will prepare a written list of deficiencies and distribute to the contractor. The contractor shall make all corrections. The contractor shall initial and date each punch list item indicating the item has been corrected. After all items have been corrected the contractor shall return the initialed punch list to the engineer and then request a back check of the punch.

1. The engineer will not back-check until the punch list has been completed and returned.

C. The engineer will perform one above ceiling punch list, one back-check, one final punch list and one back-check.

1. If additional punch lists are required due to incomplete work, the engineer shall be financially compensated for their additional time and effort. The contractor will be financially responsible for this additional time and it will be billed at our standard hourly rates.

2. If additional back-checks are required due to the contractor’s failure to complete identified items, the engineer shall be financially compensated for their additional

time and effort. The contractor will be financially responsible for this additional time and it will be billed at our standard hourly rates.

1.8 OWNER TRAINING

A. Where owner training for specific systems is specified, the contractor shall provide at a minimum the following:

1. The following shall occur prior to scheduling owner training:

a. The respective system MUST be fully operational, software programmed, all punch list items completed, and the resolution tracking form completed (if third party commissioning is provided for the project).

b. Manufacturer's startup and testing has been completed. The owner training shall not be scheduled for the same day as startup and testing.

c. The operation manuals shall be submitted to the engineer for review.

i) Include owner training agenda.

2. Sign-in sheet documenting the attendees.

3. The operation manual for the respective system. A copy shall be provided to each attendee.

a. The operation manual shall be reviewed with the attendees in conjunction with the physical demonstration of the system.

4. Physical demonstration of how to operate, program, adjust and maintain the respective system.

5. The contractor shall digitally record training sessions (video and audio). A copy of the recording shall be provided with the O&M manual.

1.9 EXISTING SYSTEMS

A. All existing equipment and systems are assumed to be fully functioning and operating properly in all their capacity unless otherwise noted.

B. Pre-Test: It is the responsibility of the contractor to provide functional testing and document in writing the condition, functionality and deficiencies of any existing equipment or systems prior to any renovations.

1. The contractor shall provide a copy of this report to the design team and owner for review and comment.

2. The owner will determine the procedures and/or methods for addressing deficiencies should any be discovered.

C. Post-Test: It is the responsibility of the contractor to provide functional testing and document in writing the condition, functionality and deficiencies of any existing equipment. This test shall occur prior to the owner occupying the facility or substantial completion, whichever occurs first.

1. The post-test is to confirm the existing systems operate at the same capacity as they did prior to construction beginning.

2. The contractor shall provide a copy of this report to the design team and owner for review and comment.

D. If the contractor fails to document the condition of any existing equipment or systems and provide a written report prior to any work commencing, and subsequently the existing system is found to have deficiencies, it will be the contractor's financial responsibility to make any and all corrections.

1. It will be at the Owner's and Engineer's sole discretion as to the extent corrections will be required, including but not limited to the full replacement of the respective equipment or system.

1.10 DEMOLITION

A. The owner reserves the right to keep any removed items. The contractor is responsible for removing any unwanted items from the site.

B. The contractor shall dispose of any demolished items in accordance with all applicable local, state and federal regulations.

C. Hazardous Material

1. Shrout Tate Wilson Consulting Engineers, PLLC is not a design professional in the determination of the presence of hazardous material or involved in making recommendations regarding hazardous material.

2. If the contractor encounters any suspected hazardous material, they shall immediately notify the owner.

END OF SECTION 26 05 00

SECTION 26 05 26 – GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to the general requirements specification, Section 26 05 00.

B. Section includes grounding and bonding systems and equipment.

1.2 SUBMITTALS

A. Product Data:

1. Provide product data for each product to be used on this project.

1.3 OPERATION AND MAINTENANCE MANUALS

A. Provide dimensioned record drawing locating test wells, ground rods or other grounding electrodes installed outside the building footprint.

B. Provide ground resistance measurements.

1.4 QUALITY ASSURANCE

A. All components shall be manufactured, listed and installed in accordance with the applicable NEMA, UL and ASTM standards.

B. Grounding and bonding materials and equipment shall comply with the UL 467 Standard.

PART 2 - PRODUCTS

2.1 CONDUCTORS

A. General Requirements

1. Refer to the raceways, boxes, power conductors and cables specification, Section 26 03 33 for conductor requirements.

a. All grounding and bonding conductors shall be insulated.

2.2 CONNECTORS

A. Connectors shall be factory-fabricated of the size, ampacity rating, material type and class for the application and service indicated.

B. Welded connections shall be exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Refer to the electrical system grounding detail on the drawings for additional information.

B. Install an equipment grounding conductor with all feeders and branch circuits.

C. All grounding and bonding conductors shall be installed in raceways, boxes or enclosures. Refer to the Raceways, Boxes, Power Conductors and Cables specification, Section 260333 for requirements.

D. The grounding conductors shall be furnished from the factory with the following insulation colors.

1. Grounding conductors shall be green.

2. Isolated grounding conductors shall be green with one or more continuous yellow stripes.

E. Make all connections so the possibility of galvanic action or electrolysis is minimized. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact are galvanically compatible.

1. Use electroplated or hot-tin-coated materials to ensure 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.

F. For grounding conductor terminations and connections not specifically addressed or noted otherwise in this specification, provide the following:

1. Utilize bolted connectors for pipe and equipment grounding conductor terminations.

2. Utilize welded connectors for underground connections.

G. Install bonding jumpers in locations accessible for inspection and maintenance except where routed through short lengths of conduit.

3.2 FUNCTIONAL TESTING

A. Tests and Inspections:

1. After installing the grounding system but before permanent electrical circuits have been energized, provide the following:

a. Inspect the physical and mechanical condition. Verify tightness of accessible, bolted, electrical connections with a calibrated torque wrench according to manufacturer's written instructions.

END OF SECTION 26 05 26

SECTION 26 05 33 – RACEWAYS, BOXES, POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to the General Requirements Specification, Section 260500.

B. This Section includes:

1. Raceways, fittings, boxes, enclosures, and cabinets for electrical wiring.
2. Building wires and cables rated 1,000V and less.
3. Connectors, splices, and terminations rated 1,000V or less.

1.2 DEFINITIONS

A. EMT: Electrical metallic tubing.

B. ENT: Electrical nonmetallic tubing.

C. FMC: Flexible metal conduit.

D. LFMC: Liquidtight flexible metal conduit.

E. LFNC: Liquidtight flexible nonmetallic conduit.

F. RNC: Rigid nonmetallic conduit.

G. RSC: Rigid galvanized steel conduit.

1.3 SUBMITTALS

A. Product Data

1. Provide product data for each product to be used on this project.

B. Shop Drawings

1. Provide shop drawings for the following raceway components. Include plans, elevations, sections, details, and attachments to other work.
   a. Custom enclosures and cabinets.
   b. Surface raceway.
   c. For handholes and boxes for underground wiring, including the following:
      1) Duct entry provisions, including locations and duct sizes.
      2) Frame and cover design.
      3) Grounding details.
      4) Dimensioned locations of cable rack inserts, and pulling-in and lifting irons.
      5) Joint details.

1.4 QUALITY ASSURANCE

A. All components shall be manufactured, listed, and installed in accordance with the applicable NEMA, ASTM B3 and B8, UL, ANSI and SCTE standards.

PART 2 - PRODUCTS

2.1 CONDUCTORS AND CABLES

A. Acceptable Manufacturers:

1. Alcan Products Corporation; Alcan Cable Division.
2. American Insulated Wire Corp.; a Leviton Company.
3. General Cable Corporation.
4. Senator Wire & Cable Company.
5. Southwire Company.

B. General Requirements:

1. All conductors shall be copper and insulated unless otherwise noted on the drawings.
2. Insulation be type THHN/THWN/THWN-2, 90°C, minimum 600-volt rating.
3. Refer to the drawings for conductor sizes. The minimum conductor size permitted shall be No. 12 AWG.
4. Solid conductor for No. 10 AWG and smaller; stranded conductor for No. 8 AWG and larger.
5. Provide type SO, hard service cord for cord drops and connections to portable appliances.

2.1 METAL CLAD CABLE, TYPE MC

A. Single circuit.

B. Cable shall be listed for the environmental air-handling spaces.

C. Steel, interlocked armor. Aluminum is not permitted.

D. Mark cable according to UL's "Wire and Cable Marking and Application Guide."

2.2 CONNECTORS AND SPLICES

A. Acceptable Manufacturers:

1. AFC Cable Systems, Inc.
2. Hubbell Power Systems, Inc.
3. O-Z/Gedney; EGS Electrical Group LLC.
4. 3M; Electrical Products Division.
5. Tyco Electronics Corp.

B. Connectors and splices shall be factory-fabricated of the size, ampacity rating, material, type, and class for application and service indicated.

2.3 METAL CONDUIT AND TUBING

A. Acceptable Manufacturers:

1. AFC Cable Systems, Inc.
2. Alflex Inc.
3. Allied Tube & Conduit; a Tyco International Ltd. Co.
4. Anamet Electrical, Inc.; Anaconda Metal Hose.
5. Electri-Flex Co.
6. Manhattan/CDT/Cole-Flex.
7. Maverick Tube Corporation.
8. O-Z Gedney; a unit of General Signal.

9. Wheatland Tube Company.

B. Fittings for all types of conduit and tubing shall be listed for the type and size raceway with which used, and for application and environment in which installed.

C. Provide steel, compression type fittings for EMT.

D. Threaded fittings shall be used for RSC.

E. Provide joint compound for RSC. The compound shall be listed for use in cable connector assemblies and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.

F. Refer to the drawings for colors/finish.

G. Refer to drawings for sizes.

1. Provide a minimum of 1-inch for conduit/tubing containing telecommunications cabling and audio/visual cabling.

2. All other conduit/tubing shall be a minimum of 3/4 inch.

2.4 NONMETALLIC CONDUIT AND TUBING

A. Acceptable Manufacturers:

1. AFC Cable Systems, Inc.

2. Anamet Electrical, Inc.; Anaconda Metal Hose.

3. Arnco Corporation.

4. CANTEX Inc.

5. CertainTeed Corp.; Pipe & Plastics Group.

6. Condux International, Inc.

7. ElecSYS, Inc.

8. Electri-Flex Co.

9. Lamson & Sessions; Carlon Electrical Products.

10. Manhattan/CDT/Cole-Flex.

11. RACO; a Hubbell Company.

12. Thomas & Betts Corporation.

B. Fittings for all types of nonmetallic conduit and tubing shall be listed for the type and size of conduit or tubing type and material with which used, and for the application and environment in which installed.

C. Refer to drawings for sizes.

1. Provide a minimum of 1-inch for conduit/tubing containing telecommunications cabling and audio/visual cabling.

2. All other conduit/tubing shall be a minimum of 3/4 inch.

D. RNC shall be type Electrical Polyvinyl Chloride (EPC).

2.5 BOXES, ENCLOSURES, AND CABINETS

A. Acceptable Manufacturers:

1. Cooper Industries, Inc.

2. EGS/Appleton Electric.

3. Hoffman.
4. Hubbell Incorporated.
5. Wiremold, Legrand LLC.

B. Outlet and Device Boxes
1. Dimensions:
a. Minimum 2 1/8 inches deep.
b. Minimum 2-gang (4-11/16-inch square) for all boxes.
2. Provide plaster ring as required for device(s) and wall construction type.

C. Sheet metal outlet device boxes and small pull and junction boxes shall be constructed of welded steel.

D. Cast-Metal outlet device boxes and small pull and junction boxes shall be constructed of cast aluminum, type FD, with gasketed cover.

E. Refer to the drawings for floor box type(s) and configuration(s).

F. Enclosures and cabinets shall comply with the following unless otherwise noted on the drawings:
1. Constructed of galvanized steel.
2. Finished inside and out with manufacturers standard enamel.
3. Continuous hinged cover.
4. Flush latch keyed to match panelboards.
5. Provide accessory feet where freestanding.

PART 3 - EXECUTION

3.1 COORDINATION

A. Where surface raceways are permitted to be installed by the contract documents, coordinate installation with architectural drawings including windows, furniture, display boards, etc.

B. Coordinate the installation of raceways, boxes, etc. with all other trades.
1. Install horizontal raceways above water and steam piping.
2. Maintain a minimum of 6 inches of separation between raceways and steam, flues, and hot-water pipes.

C. Provide protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

3.2 INSTALLATION

A. General Requirements
1. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on the drawings or in this article are stricter.
2. All conduit, raceways, boxes, etc. shall be installed concealed unless noted otherwise on the drawings or listed in the following exceptions:
a. In dedicated electrical or mechanical rooms/spaces.
b. Areas with exposed ceilings/structure.
c. Existing inaccessible walls.

1) FMC shall be fished/installed within CMU walls where the cells have not been filled with concrete.

3. Do not fasten conduits onto the bottom side of the roof deck.

4. Install raceways parallel or perpendicular to building lines.

5. All items shall be wet location rated when installed in wet locations.

6. Install no more than the total of 270 degree of bends in any conduit run, prior to installing a pull box, except for conduits/raceways containing voice/data and audio/visual cabling which require less.

7. Label all junction box covers with black permanent marker, identifying the circuit numbers contained within.

8. Complete raceway installation before starting conductor installation.

9. Arrange stub-ups so curved portions of bends are not visible above the finished slab.

10. Raceways shall not be embedded in slabs unless explicitly noted to do so on the drawings. If raceways are noted to be embedded in slabs, comply with the following:

    a. Run conduits parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.

    b. Arrange raceways to cross building expansion joints at right angles with expansion fittings.

    c. Change from RNC to rigid steel conduit or EMT, as applicable, before rising above the floor.

11. Apply listed compound to threads of raceway and fittings before making up joints. Follow compound manufacturer's written instructions.

12. Use insulating bushings to protect conductors, including conductors smaller than No. 4 AWG, for terminations at locations subject to moisture or vibration.

13. RSC shall be terminated into threaded hubs or with locknuts on the inside and outside of boxes or cabinets.

    a. Provide insulated throat bushings for RSC terminated with locknuts.

14. Install pull strings in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb. (90-kg) tensile strength. Leave at least 12 inches of slack at each end of pull strings.

15. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

    a. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces

    b. Where otherwise required by NFPA 70.

16. Provide flexible metallic conduit connections for the following:

    a. Recessed and semi-recessed lighting fixtures. Use a maximum of 72 inches for connections.

    b. For equipment subject to vibration, noise transmission or movement and for transformers and motors. Use a maximum of 36 inches.

c. Use LFMC in damp or wet locations.

17. For recessed boxes in masonry wall, saw-cut opening for box in center of cell of masonry block, and install box flush with surface of wall.

a. Horizontally separate boxes mounted on opposite sides of walls, so they are not in the same vertical channel.

18. Support boxes from building structure. Do not support boxes from conduit.

19. Do not rely on locknuts to penetrate nonconductive coatings on enclosures. Remove coatings in the locknut area prior to assembling conduit to enclosure to assure a continuous grounding path.

B. Conductors

1. Conductors shall be installed in raceway in all locations unless otherwise noted.

2. Where cord drops and portable appliance connections are indicated on the drawings, provide stainless steel wire mesh strain relief at terminations to suit application.

3. All new line voltage wiring shall confirm to the following color schemes. The insulation shall be as furnished from the factory for all conductor sizes. Phase taping will not be permitted.

a. 120/208- or 120/240-Volt Systems

1) Phase A – Black

2) Phase B – Red

3) Phase C – Blue

4) Neutral – White

5) Ground – Green

b. 277/480 Volt Systems

1) Phase A – Brown

2) Phase B – Orange

3) Phase C – Yellow

4) Neutral – Gray

5) Ground – Green

4. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

5. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

6. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."

7. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified by UL.

8. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

9. Install conductors at each outlet with at least 6 inches of slack.

10. Where conductors are oversized (such as for voltage drop), provide conductor reducers or other approved wire reduction method as required for termination at the respective equipment.

C. Interior, above grade locations shall comply with the following:

1. When the use of surface raceway (Wiremold) is permitted by the contract documents, it shall be installed in finished areas/spaces.

2. MC cable

1) Locations permitted:

i) Concealed within metal or wood stud walls only.

ii) Concealed above finished ceilings.

iii) 8 feet above finished floor and higher where exposed in unfinished spaces.

2) The MC cable shall transition to other specified raceways where it exits permitted locations.

3) Provide cable with insulated bushings at terminations.

3. All boxes shall be steel.

4. All enclosures shall be NEMA Type 1 unless otherwise noted on the drawings.

D. Below grade locations shall comply with the following:

1. All raceways shall be RNC, schedule 40, unless otherwise noted on the drawings.

2. Transition from RNC to EMT at the point the conduit rises above the slab. Transition from RNC to RSC before the conduit rises above the finished grade for exterior locations.

3. All cabling or conductors installed in raceway below grade shall be rated for wet locations.

E. Exterior, above grade locations, where permitted by the contract documents to be exposed, comply with the following:

1. All raceways, boxes, enclosures, conductors, cabling, etc. shall be wet location rated. Any fittings shall be watertight.

2. All raceways shall be RSC with threaded connections unless otherwise noted on the drawings.

a. Raceways shall be painted battleship gray unless otherwise noted on the drawings.

3. All boxes shall be cast metal.

4. All enclosures shall be NEMA Type 3R unless otherwise noted on the drawings.

END OF SECTION 26 05 33

SECTION 26 27 26 – WIRING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Refer to the general requirements specification, Section 26 05 00.

B. 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. Receptacles, receptacles with integral GFCI, and associated device plates.
2. Twist-locking receptacles.
3. Wall-box motion sensors.
4. Snap switches and wall-box dimmers.
5. Solid-state fan speed controls.
6. Wall-switch and exterior occupancy sensors.
7. Cord and plug sets.
8. Floor service outlets, poke-through assemblies, service poles, and multioutlet assemblies.

B. Related Sections include the following:

1. Division 27 Section "Communications Horizontal Cabling" for workstation outlets.

1.3 DEFINITIONS

A. EMI: Electromagnetic interference.

B. GFCI: Ground-fault circuit interrupter.

C. Pigtail: Short lead used to connect a device to a branch-circuit conductor.

D. RFI: Radio-frequency interference.

E. TVSS: Transient voltage surge suppressor.

F. UTP: Unshielded twisted pair.

1.4 SUBMITTALS

A. Product Data: For each type of product indicated.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain each type of wiring device and associated wall plate through one source from a single manufacturer. Insofar as they are available, obtain all wiring devices and associated wall plates from a single manufacturer and one source.

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 NFPA 70.

1.6 COORDINATION

A. Receptacles for Owner-Furnished Equipment: Match plug configurations.

1. Cord and Plug Sets: Match equipment requirements.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers' Names: Shortened versions (shown in parentheses) of the following manufacturers' names are used in other Part 2 articles:

1. Cooper Wiring Devices; a division of Cooper Industries, Inc. (Cooper).
2. Hubbell Incorporated; Wiring Device-Kellems (Hubbell).
3. Leviton Mfg. Company Inc. (Leviton).
4. Pass & Seymour/Legrand; Wiring Devices & Accessories (Pass & Seymour).

2.2 STRAIGHT BLADE RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 configuration 5-20R, and UL 498. Receptacles shall have nickel-plated brass strap and a one piece strap with integral ground.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Cooper; 5351 (single), 5352 (duplex).
   b. Hubbell; HBL5351 (single), CR5352 (duplex).
   c. Leviton; 5891 (single), 5352 (duplex).
   d. Pass & Seymour; 5381 (single), 5352 (duplex).

2.3 GFCI RECEPTACLES

A. General Description: Straight blade, feed-through type. Comply with NEMA WD 1, NEMA WD 6, UL 498, and UL 943, Class A, safe lock protection, and include indicator light that is lighted when device is tripped.

B. Duplex GFCI Convenience Receptacles, 125 V, 20 A:

1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper; GF20.
   b. Pass & Seymour; 2084.

2.4 TAMPER-RESISTANT RECEPTACLES

A. Convenience Receptacles, 125 V, 20 A: Comply with NEMA WD 1, NEMA WD 6 Configuration 5-20R, UL 498 Supplement SD, and FS W-C-596.

1. Products: Subject to compliance with requirements products that may be incorporated into the Work include, but are not limited to, the following:
   a. Cooper; TR8300.
   b. Hubbell; HBL8300SGA.
   c. Leviton; 8300-SGG.
   d. Pass & Seymour; TR63H.

2.5 SNAP SWITCHES

A. Comply with NEMA WD 1 and UL 20.

B. Switches, 120/277 V, 20 A:

1. Products: Subject to compliance with requirements, provide one of the following:

a. Cooper; 2221 (single pole), 2222 (two pole), 2223 (three way), 2224 (four way).

b. Hubbell; CS1221 (single pole), CS1222 (two pole), CS1223 (three way), CS1224 (four way).

c. Leviton; 1221-2 (single pole), 1222-2 (two pole), 1223-2 (three way), 1224-2 (four way).

d. Pass & Seymour; 20AC1 (single pole), 20AC2 (two pole), 20AC3 (three way), 20AC4 (four way).

2.6 WALL PLATES

A. Single and combination types to match corresponding wiring devices.

1. Plate-Securing Screws: Metal with head color to match plate finish.

2. Material for All Spaces: Nylon

B. Wet-Location, Weatherproof Cover Plates: NEMA 250, complying with type 3R weather-resistant, “While In Use” die-cast aluminum with lockable cover.

2.7 FINISHES

A. Color: Wiring device catalog numbers in Section Text do not designate device color.

1. Wiring Devices Connected to Normal Power System: As selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.

B. Coordination with Other Trades:

1. Take steps to insure that devices and their boxes are protected. Do not place wall finish materials over device boxes and do not cut holes for boxes with routers that are guided by riding against outside of the boxes.

2. Keep outlet boxes free of plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other material that may contaminate the raceway system, conductors, and cables.

3. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is troweled flush with the face of the wall.

4. Install wiring devices after all wall preparation, including painting, is complete.

C. Conductors:

1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.

2. Strip insulation evenly around the conductor using tools designed for the purpose. Avoid scoring or nicking of solid wire or cutting strands from stranded wire.

3. The length of free conductors at outlets for devices shall meet provisions of NFPA 70, Article 300, without pigtails.

4. Existing Conductors:

a. Cut back and pigtail, or replace all damaged conductors.

b. Straighten conductors that remain and remove corrosion and foreign matter.

c. Pigtailing existing conductors is permitted provided the outlet box is large enough.

D. Device Installation:

1. Replace all devices that have been in temporary use during construction or that show signs that they were installed before building finishing operations were complete.

2. Keep each wiring device in its package or otherwise protected until it is time to connect conductors.

3. Do not remove surface protection, such as plastic film and smudge covers, until the last possible moment.

4. Connect devices to branch circuits using pigtails that are not less than 6 inches in length.

5. When there is a choice, use side wiring with binding-head screw terminals. Wrap solid conductor tightly clockwise, 2/3 to 3/4 of the way around terminal screw.

6. Use a torque screwdriver when a torque is recommended or required by the manufacturer.

7. When conductors larger than No. 12 AWG are installed on 15- or 20-A circuits, splice No. 12 AWG pigtails for device connections.

8. Tighten unused terminal screws on the device.

9. When mounting into metal boxes, remove the fiber or plastic washers used to hold device mounting screws in yokes, allowing metal-to-metal contact.

E. Receptacle Orientation:

1. Install ground pin of vertically mounted receptacles up, and on horizontally mounted receptacles to the right.

F. Device Plates: Do not use oversized or extra-deep plates. Repair wall finishes and remount outlet boxes when standard device plates do not fit flush or do not cover rough wall opening.

G. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

END OF SECTION 26 27 26

SECTION 26 28 16 – ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Refer to the general requirements specification, Section 26 05 00.

B. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Fusible switches.
2. Nonfusible switches.
3. Shunt trip switches.
4. Molded-case circuit breakers (MCCBs).
5. Molded-case switches.
6. Enclosures.

1.3 DEFINITIONS

A. NC: Normally closed.

B. NO: Normally open.

C. SPDT: Single pole, double throw.

1.4 SUBMITTALS

A. Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated. Include dimensioned elevations, sections, weights, and manufacturers' technical data on features, performance, electrical characteristics, ratings, accessories, and finishes.

1. Enclosure types and details for types other than NEMA 250, Type 1.
2. Current and voltage ratings.
3. Short-circuit current ratings (interrupting and withstand, as appropriate).
4. Detail features, characteristics, ratings, and factory settings of individual overcurrent protective devices, accessories, and auxiliary components.

B. Field quality-control reports.

1. Test procedures used.
2. Test results that comply with requirements.
3. Results of failed tests and corrective action taken to achieve test results that comply with requirements.

C. Manufacturer's field service report.

D. Operation and Maintenance Data: For enclosed switches and circuit breakers to include in emergency, operation, and maintenance manuals. In addition to items specified in Division 01 Section "Operation and Maintenance Data," include the following:

1. Manufacturer's written instructions for testing and adjusting enclosed switches and circuit breakers.

2. Time-current coordination curves (average melt) for each type and rating of overcurrent protective device; include selectable ranges for each type of overcurrent protective device.

1.5 QUALITY ASSURANCE

A. Source Limitations: Obtain enclosed switches and circuit breakers, overcurrent protective devices, components, and accessories, within same product category, from single source from single manufacturer.

B. Product Selection for Restricted Space: Drawings indicate maximum dimensions for enclosed switches and circuit breakers, including clearances between enclosures, and adjacent surfaces and other items.

C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. Comply with NFPA 70.

1.6 PROJECT CONDITIONS

A. Environmental Limitations: Rate equipment for continuous operation under the following conditions unless otherwise indicated:

1. Ambient Temperature: Not less than minus 22 deg F and not exceeding 104 deg F.

2. Altitude: Not exceeding 6600 feet.

B. Interruption of Existing Electric Service: Do not interrupt electric service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary electric service according to requirements indicated:

1. Notify Architect and Owner no fewer than seven days in advance of proposed interruption of electric service.

2. Indicate method of providing temporary electric service.

3. Do not proceed with interruption of electric service without Architect's and Owner's written permission.

4. Comply with NFPA 70E.

1.7 COORDINATION

A. Coordinate layout and installation of switches, circuit breakers, and components with equipment served and adjacent surfaces. Maintain required workspace clearances and required clearances for equipment access doors and panels.

PART 2 - PRODUCTS

2.1 FUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

3. Siemens Energy & Automation, Inc.

4. Square D; a brand of Schneider Electric.

B. Type HD, Heavy Duty, Single Throw, 230 or 600V ac as indicated, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, with clips or bolt pads to accommodate indicated fuses, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.

2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

3. Class R Fuse Kit: Provides rejection of other fuse types when Class R fuses are specified.

4. Lugs: Mechanical type, suitable for number, size, and conductor material.

5. Service-Rated Switches: Labeled for use as service equipment.

2.2 NONFUSIBLE SWITCHES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

3. Siemens Energy & Automation, Inc.

4. Square D; a brand of Schneider Electric.

B. Type HD, Heavy Duty, Single Throw, 240 or 600-V ac, 1200 A and Smaller: UL 98 and NEMA KS 1, horsepower rated, lockable handle with capability to accept three padlocks, and interlocked with cover in closed position.

C. Accessories:

1. Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.

2. Neutral Kit: Internally mounted; insulated, capable of being grounded and bonded; labeled for copper and aluminum neutral conductors.

3. Lugs: Mechanical type, suitable for number, size, and conductor material.

2.3 MOLDED-CASE CIRCUIT BREAKERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Eaton Electrical Inc.; Cutler-Hammer Business Unit.

2. General Electric Company; GE Consumer & Industrial - Electrical Distribution.

3. Siemens Energy & Automation, Inc.

4. Square D; a brand of Schneider Electric.

B. General Requirements: Comply with UL 489, NEMA AB 1, and NEMA AB 3, with interrupting capacity to comply with available fault currents.

C. Alternate Maintenance Setting (AMS) Switch. Switch shall be provided for the temporary arc-flash incident energy reduction during maintenance activities. Provide for circuit breakers where the actual overcurrent device installed in the circuit breakers are rated or can be adjusted to 1,200 amps or higher.

1. Provide a manual switch on the compartment door to switch the circuit breaker's short-time tripping characteristics to instantaneous with minimum pick-up setting in order to reduce the danger from a potential arc-flash at downstream equipment.
2. Provide a lock feature for the AMS switch so that it may be locked in either the off or on maintenance mode position.
3. Provide a blue LED indicating light to indicate the AMS switch is in the maintenance mode.

D. Thermal-Magnetic Circuit Breakers: Inverse time-current element for low-level overloads and instantaneous magnetic trip element for short circuits. Adjustable magnetic trip setting for circuit-breaker frame sizes 250 A and larger.

E. Adjustable, Instantaneous-Trip Circuit Breakers: Magnetic trip element with front-mounted, field-adjustable trip setting.

F. Electronic Trip Circuit Breakers: Field-replaceable rating plug, rms sensing, with the following field-adjustable settings:

1. Instantaneous trip.
2. Long- and short-time pickup levels.
3. Long- and short-time time adjustments.
4. Ground-fault pickup level, time delay, and I2t response.

G. Ground-Fault, Circuit-Interrupter (GFCI) Circuit Breakers: Single- and two-pole configurations with Class A ground-fault protection (6-mA trip).

H. Ground-Fault, Equipment-Protection (GFEP) Circuit Breakers: With Class B ground-fault protection (30-mA trip).

I. Features and Accessories:

1. Standard frame sizes, trip ratings, and number of poles.
2. Lugs: Mechanical type, suitable for number, size, trip ratings, and conductor material.
3. Application Listing: Appropriate for application; Type SWD for switching fluorescent lighting loads; Type HID for feeding fluorescent and high-intensity discharge lighting circuits.
4. Ground-Fault Protection: Comply with UL 1053; integrally mounted, self-powered type with mechanical ground-fault indicator; relay with adjustable pickup and time-delay settings, push-to-test feature, internal memory, and shunt trip unit; and three-phase, zero-sequence current transformer/sensor.
5. Shunt Trip: Trip coil energized from separate circuit, with coil-clearing contact.

2.4 ENCLOSURES

A. Enclosed Switches and Circuit Breakers: NEMA AB 1, NEMA KS 1, NEMA 250, and UL 50, to comply with environmental conditions at installed location.

1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
2. Outdoor Locations: NEMA 250, Type 3R.
3. Kitchen or Wash-Down Areas: NEMA 250, Type 4X, stainless steel .
4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 3R.

5. Indoor Locations Subject to Dust, Falling Dirt, and Dripping Noncorrosive Liquids: NEMA 250, Type 12.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine elements and surfaces to receive enclosed switches and circuit breakers for compliance with installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

A. Install individual wall-mounted switches and circuit breakers with tops at uniform height unless otherwise indicated.

B. Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

C. Install fuses in fusible devices.

D. Comply with NECA 1.

3.3 IDENTIFICATION

A. Label each enclosure with engraved metal or laminated-plastic nameplate.

END OF SECTION 26 28 16

SECTION 26 51 00 – LIGHTING

PART 1 - GENERAL

1.1 SUMMARY

A. Refer to the General Requirements Specifications, Section 260500.

B. Section Includes:

1. Interior and exterior lighting fixtures, lamps, ballasts, LED drivers.
2. Emergency lighting units.
3. Exit signs.
4. Lighting fixture supports.
5. Poles and accessories.

C. Refer to the light fixture schedule on the contract drawings for specific light fixture requirements and acceptable manufacturers.

D. Basis of Design light fixtures are described and listed on the fixture schedule with corresponding catalog numbers. Equivalent manufacturers listed in the schedule without corresponding catalog numbers are responsible for meeting the quality standards and photometric distribution set by the specified product.

1. Identification of the basis of design light fixtures by means of manufacturers' names and catalog numbers is to establish basic features, quality and performance standards, and it is not intended to limit competition. Any substitutions must meet or exceed these standards.

E. Substitutions and/or requests to have a manufacturer added as an acceptable equivalent manufacturer shall be made no later than 14 days prior to the bid date.

F. Those proposing substitutions shall submit the following to the engineer:

1. Cutsheets for each fixture. Cutsheets shall include at a minimum a picture and description of fixture construction, lamp type, efficiency, and any accessories.
2. The engineer may require lighting calculations for specific areas to ensure the substitute fixtures will provide adequate lighting levels.

1.2 DEFINITIONS

A. CCT: Correlated color temperature.

B. CRI: Color-rendering index.

C. HID: High-intensity discharge.

D. LER: Luminaire efficacy rating.

E. Lumen: Measured output of lamp and luminaire, or both.

F. Luminaire: Complete lighting fixture, including housing, ballast LED array, electronic drivers, and integral controls.

G. Pole: Luminaire support structure.

1.3 SUBMITTALS

A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, finishes, and the following:

1. Physical description of lighting fixture and poles including dimensions, materials, and finishes.

2. Emergency lighting units including battery and charger.

3. LED drivers.

4. Life (L7O for LED), output (lumens, CCT, and CRI), and energy-efficiency data.

5. For lamp types other than integrated LED's, provide cutsheets for each lamp to be installed.

6. Photometric data and adjustment factors based on laboratory tests, complying with IESNA Lighting Measurements Testing & Calculation Guides, of each lighting fixture. 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.

7. Details of attaching luminaires and accessories.

B. Operation and Maintenance Data: For lighting equipment and fixtures to include in emergency, operation, and maintenance manuals.

1. Provide a list of all special warranties, per fixture type, that are longer than the standard one-year warranty.

1.4 WARRANTY

A. Special Warranty for Emergency Lighting Batteries: The manufacturer agrees to replace or repair components that fail in material or workmanship within the specified period.

1. Warranty Period for Emergency Lighting Unit Batteries: Three years from the date of Substantial Completion.

2. Warranty Period for Emergency Fluorescent Ballast and Self-Powered Exit Sign Batteries: Three years from the date of Substantial Completion.

3. The electrical contractor shall be responsible for replacing or repairing all components that fail within one year of the date of Substantial Completion.

4. Warranties that extend beyond one year after Substantial Completion shall apply to materials only. Labor is excluded after the first year.

B. Special warranty for LED luminaries and devices: The manufacturer agrees to repair or replace the driver and all components of the luminaire that fail in materials or workmanship or have a loss in performance within the specified warranty period listed below:

1. Warranty Period: Five (5) years from the date of substantial completion.

2. The electrical contractor shall be responsible for repairing or replacing all components that fail within one year of the date of substantial completion.

3. Warranties that extend beyond one year from the date of substantial completion shall apply to material only. Labor is excluded after the first year.

C. 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 Luminaires: Five years from date of Substantial Completion.

2. Warranty Period for Metal Corrosion: Five years from date of Substantial Completion.

3. Warranty Period for Color Retention: Five 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 than three years from date of Substantial Completion.

5. The Electrical Contractor shall be responsible for repairing or replacing all components that fail within one year of the date of substantial completion.

6. Warranties that extend beyond one year from the date of substantial completion shall apply to material only. Labor is excluded after the first year.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers are listed in the fixture schedule.

2.2 GENERAL REQUIREMENTS FOR WARRANTIES AND COMPONENTS

A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.

B. LED Fixtures: Comply with UL 8750.

C. Metal Parts: Free of burrs and sharp corners and edges.

D. Sheet Metal Components: Steel unless otherwise indicated. Form and support to prevent warping and sagging.

E. 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.

F. Plastic parts and acrylic lighting diffusers shall be 100 percent virgin acrylic plastic. Have a high resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation. UV stabilized.

G. Non-Integrated LED Luminaire Factory-Applied Labels: Include recommended lamps and ballasts. Labels shall be located where they will be readily visible to service personnel, but not seen from normal viewing angles when lamps are in place.

1. Label shall include the following lamp and ballast characteristics:

a. "USE ONLY" and include specific lamp type.

b. Lamp diameter code (T-4, T-5, T-8, T-12, etc.), tube configuration (twin, quad, triple, etc.), base type, and nominal wattage for fluorescent and compact fluorescent luminaires.

c. Lamp type, wattage, bulb type (ED17, BD56, etc.) and coating (clear or coated) for HID luminaires.

d. Start type (preheat, rapid start, instant start, etc.) for fluorescent and compact fluorescent luminaires.

e. ANSI ballast type (M98, M57, etc.) for HID luminaires.

f. CCT and CRI for all luminaires.

H. Integrated LED Luminaire Factory Applied Labels:

1. Each luminaire shall have the manufacturer’s name, trademark, model number, serial number, date of manufacture and lot number as identification, permanently marked inside each unit and outside each packaging box.

2. The rated voltage, rated power in watts and volt-amperes shall be permanently marked inside each unit.

I. Exterior luminaires shall be U. L. listed and labeled for installation in wet locations. Interior luminaires located in wet environments shall be U. L. listed and labeled for installation in wet locations.

J. Luminaire efficiency ratings (LER) shall be tested according to NEMA standards for the type of fixture specified.

K. Luminaire Finish: manufacturer's standard or custom paint , as indicted in the Light Fixture Schedule, applied to factory-assembled and tested luminaires before shipping. Match finish for pole and support materials. Colors to be selected by Architect during shop drawing review.

L. LED Luminaire General Requirements

1. Each luminaire shall be tested to operate at an average ambient operating temperature of 25°C. Fixtures located in certain operating environments may require the ability to operate in higher or lower ambient temperature environment and still maintain their longevity, CCT and lumen output.

2. Each luminaire shall meet all parameters of this specification throughout the minimum operational life of 50,000 hours when operated at the average operating temperature.

3. The luminaire shall be a single, self-contained device, not requiring on-site assembly for installation.

4. Polymeric materials (if used) of enclosures containing either the power supply or electronic components of the luminaire shall be made of UL94VO flame retardant materials. Luminaire lenses are excluded from this requirement.

5. The assembly and manufacturing process for the Solid State Lighting luminaire shall be designed to assure all internal components are adequately supported to withstand mechanical shock and vibration.

6. LEDs shall be manufactured by a manufacturer who has produced commercial LEDs for a minimum of five (5) years.

7. Lumen Output – minimum initial delivered lumen output of the luminaire shall be the lumens exiting the luminaire in the 0-360 degree zone - as measured by IESNA Standard LM-79-08 in an accredited lab. Exact tested lumen output shall be clearly noted on the shop drawings.

8. Lumen output shall not decrease by more than 20% over the minimum operational life of 50,000 hours at the rated ambient operating temperature.

9. Individual LEDs shall be connected such that a catastrophic loss or the failure of one LED will not result in the loss of the entire luminaire.

10. LED Boards shall be suitable for field maintenance and have plug-in connectors. LED boards shall be upgradable.

11. Light Color/Quality-

a. Correlated Color temperature (CCT), as indicated in the light fixture schedule, shall be correlated to chromaticity as defined by the absolute (X,Y) coordinates on the 2-D CIE chromaticity chart.

b. Color shift over 6,000 hours shall be <0.007 change in u' v' as demonstrated in IES LM80 report.

c. The color rendition index (CRI) shall be 80 or greater.

d. LED boards to be tested for color consistency and shall be within a space of 2.5 MacAdam ellipses on the CIE chromaticity chart.

12. Thermal Management

a. The thermal management (of the heat generated by the LEDs) shall be of sufficient capacity to assure proper operation of the luminaire over the expected useful life.

b. The LED manufacturer's maximum junction temperature for the expected life shall not be exceeded at the average operating ambient.

c. The LED manufacturer's maximum junction temperature for the catastrophic failure shall not be exceeded at the maximum operating ambient.

d. The Driver manufacturer's maximum case temperature shall not be exceeded at the maximum operating ambient. Thermal management shall be passive by design. The use of fans or other mechanical devices shall not be allowed.

2.3 REPLACEABLE, NON-INTEGRATED LED LAMPS

A. Acceptable Manufacturers

1. Osram Sylvania
2. GE
3. Philips
4. Ushio

B. Minimum CRI of 80, color temperature as indicated in the fixture schedule and minimum 25,000 hour life expectancy.

2.4 LED POWER SUPPLIES AND DRIVERS

A. Driver shall meet or exceed the criteria herein:

1. Ten-year expected life while operating at maximum case temperature and 90 percent non-condensing relative humidity.
2. Driver should be UL Recognized under the component program and shall be modular for simple field replacement.
3. Electrical characteristics: 120 – 277 volt, UL Listed, CSA Certified, Sound Rated A+. Driver shall be > 80% efficient at full load across all input voltages. Input wires shall be 18AWG solid copper minimum.
4. Dimming: Driver shall be suitable for full-range dimming. The luminaire shall be capable of continuous dimming without perceivable flicker over a range of 100 percent to 0.1 percent of rated lumen output with a smooth shut off function.
5. Dimming shall be controlled by a 0-10V signal, "DMX", forward phase or electronic low voltage as indicated in the fixture schedule and/or drawings.
6. Driver shall include ability to provide no light output when the control signal drops below 0.5 V and shall consume 0.5 watts or less in this standby.
7. Driver shall be capable of configuring a linear or logarithmic dimming curve.
8. Drivers shall track evenly across multiple fixtures at all light levels and shall have an input signal to output light level that allows smooth adjustment over the entire dimming range regardless of the controller type.
9. Flicker: Driver and luminaire electronics shall deliver illumination that is free from objectionable flicker as measured by flicker index (ANSI/IES RP-16-10). At all points within the dimming range from 100-0.1 percent luminaire shall have:

a. Less than 1 percent flicker index at frequencies below 120 Hz.

b. Less than 12 percent flicker index at 120 Hz and shall not increase at greater than 0.1 percent per Hz to a maximum of 80 percent flicker index at 800Hz.

10. Driver disconnect shall be provided.

11. The surge protection which resides within the driver shall protect the luminaire from damage and failure for transient voltages and currents as defined in ANSI/IEEE C64.41 2002 for Location Category A, where failure does not mean a momentary loss of light during the transient event.

B. Electrical Requirements

1. Operation Voltage - The luminaire shall operate from at 60 HZ ±3 HZ AC line over a voltage ranging from 120 VAC to 277 VAC. The fluctuations of line voltage of plus or minus 10% shall have no visible effect on the luminous output.

2. Power Factor: The luminaire shall have a power factor of 90% or greater at all standard operating voltages and full luminaire output.

3. THD: Total harmonic distortion (current and voltage) induced into an AC power line by a luminaire shall not exceed 20 percent at any standard input voltage and meet ANSI C82.11 maximum allowable THD requirements.

4. In Rush Current: Meet or exceed NEMA 410 driver inrush standard of 430 Amps per 10 Amps load with a maximum of 370 Amps 2 – seconds.

5. RF Interference: The luminaire and associated on-board circuitry must meet Class A emission limits referred in Federal Communications Commission (FCC) Title 47, Subpart B, Section 15 Non-Consumer requirements for EMI/RFI emissions.

6. Driver must support automatic adaptation, allowing for future luminaire upgrades and enhancements and deliver improved performance:

7. Adjustment of forward LED voltage, supporting 3V through 60V.

8. Adjustment of LED current from 200mA to 1.05A at the 100 percent control input point in increments of 1mA

9. Adjustment for operating hours to maintain constant lumens (within 5 percent) over the 50,000 hour design life of the system and deliver up to 20 percent energy savings early in the life cycle.

10. Electrical connections between normal power and driver must be modular utilizing a snap fit connector. All electrical components must be easily accessible after installation and be replaceable without removing the fixture from the ceiling.

11. All electrical components shall be RoHS compliant.

2.5 LUMINAIRE-MOUNTED PHOTOELECTRIC RELAYS

A. Comply with UL 773 or UL 773A.

B. 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. Relay with locking-type receptacle shall comply with ANSI C136.10.

2. Adjustable window slide for adjusting on-off set points.

2.6 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel- and angle-iron supports, and nonmetallic channel and angle supports.

B. Single-Stem Hangers: 1/2-inch steel tubing with swivel ball fittings and ceiling canopy. Finish same as fixture.

C. Twin-Stem Hangers: Two, 1/2-inch steel tubes with single canopy designed to mount a single fixture. Finish same as fixture.

D. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.

E. Rod Hangers: 3/16-inch minimum diameter, cadmium-plated, threaded steel rod.

F. Hook Hangers: Integrated assembly matched to fixture and line voltage and equipped with threaded attachment, cord, and locking-type plug.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Comply with the manufacturer’s installation recommendations and guidelines.

B. Lighting fixtures:

1. Set level, plumb, and square with ceilings and walls unless otherwise indicated.

2. Install lamps in each luminaire.

C. Temporary Lighting: If it is necessary, and approved by the Engineer, 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, install new lamps, and reinstall.

3.2 FIELD QUALITY CONTROL

A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.

B. Inspect each installed fixture for damage. Replace damaged fixtures and components.

C. Illumination Observations: Verify normal operation of lighting units after installing luminaires and energizing circuits with normal power source.

D. Verify luminaires are operating seemlessly with the lighting controls.

END OF SECTION 26 51 00