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**Stark Metropolitan Housing Authority
Alliance Towers
350 S. Arch Ave.
Alliance, OH 44601**

**TC PROJECT NO: 69A21
DATE: April 7, 2022**

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**INVITATION FOR BID
FOR
RENOVATION AT ALLIANCE SENIOR TOWER**

**STARK METROPOLITAN
HOUSING AUTHORITY**

IFB #050320221

Prepared by:

Procurement & Contracting Department

Alliance Senior Tower c/o

The Stark Metropolitan Housing Authority

400 Tuscarawas Street East

Canton, Ohio 44702

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INTRODUCTION

The Agency

Alliance Senior Tower LLC. (AT) is a 101 unit eight story high rise located at 350 South Arch Avenue, Alliance OH 44601 in Stark County. Listed as parcel #111940 on Stark County Auditor's website. AT is incorporated in State of Ohio and 100% owned by Stark Metropolitan Housing Authority (SMHA). Built in 1979 on 1.91 acres with 11,268 square feet. Consists of 100 leasable one bedroom units currently renting for \$710.00.

AT is a U.S. Department of Housing and Urban Development (HUD) approved multifamily subsidized property. SMHA acquired the property in late 2012 and has operated it since.

OWNER/MANAGER

Stark Metropolitan Housing Authority (hereinafter, "the Agency") a political subdivision of the State of Ohio is governed by the Ohio Revised Code and the U.S. Department of Housing and Urban Development (HUD). The Agency is a public entity that was formed to provide federally subsidized housing and housing assistance to low-income families. The Agency is headed by an Executive Director and is governed by a five-person Board of Commissioners. SMHA has 2,301 subsidized public housing rental units, 100 multifamily subsidized units, and 17 additional non-public housing units consisting of family sites, high rises, and scattered sites located throughout Stark County.

As a part of our social mission and federal mandate, the Agency is committed to providing eligible residents of Stark County with quality, affordable housing in decent, safe, and nourishing neighborhoods. By working in partnership with the public and private sectors the Agency provides families with housing choices and opportunities. SMHA has been the AT managing agent since May 2015. No land use restricted agreement exists on property.

The Invitation for Bids (IFB)

The ALLIANCE TOWER and its affiliated entities are seeking sealed bids from qualified service providers with demonstrated competence and experience to provide all labor and material required to perform **Renovation at Alliance Senior Tower**.

The Invitation for Bids can be obtained online at www.starkmha.org; or by contacting the SMHA Procurement & Contracting Department at bids@starkmha.org.

This Invitation for Bids contains submission requirements, scope of services, period of services, terms and conditions and other pertinent information for submitting a proper and responsive bid. **Prospective Bidders desiring any explanation or interpretation of the solicitation must request it, in writing, by the deadline identified in this IFB (see pg. 4 IFB INFORMATION AT A GLANCE)**. The request must be addressed to the Procurement & Contracting Department, and sent either via email to bids@starkmha.org or by mail. Any information given to a prospective Bidder about this solicitation will be furnished to all other prospective Bidders as a written amendment to the solicitation.

All responses to the IFB must be enclosed in a sealed envelope and labeled as follows:

ALLIANCE TOWER
Attn: Director of Procurement
400 Tuscarawas Street East
Canton, Ohio 44702

IFB# 050320221

Due Date and Time: June 8, 2022 2:00 PM (EST)

Late submissions will not be accepted. Submissions received prior to the opening will be held in confidence until the opening. After evaluation of the responses, the Contract will be awarded to the most responsible/responsive Bidder(s) representing the "Best Value" to AT. The resulting Contract may be funded through Section 3 covered assistance and as such will be subject to Section 3, 24 CFR Part 135. AT and its affiliated entities reserve the right to reject any and all submissions.

Notice: Contact with members of AT Board of Commissioners, or AT officers and employees other than the contact person shown above, by any prospective Bidder, after publication of the IFB and prior to the execution of a contract with the successful Bidder(s) could result in disqualification of your bid. In fairness to all prospective Bidder(s) during the IFB process, if AT meets in person with anyone representing a potential provider of these services to discuss this IFB other than at the pre-submittal meeting, an addendum will be issued to address all questions so as to ensure no Bidder has a competitive advantage over another. This does not exclude meetings red to conduct business not related to the IFB, or possible personal presentations after written qualifications have been received and evaluated.

IFB INFORMATION AT A GLANCE

AT CONTACT PERSON	Procurement & Contracting Specialist bids@starkmha.org
HOW TO OBTAIN THE IFB DOCUMENTS	1. Access: www.starkmha.org 2. Email Request to: Procurement & Contracting Department bids@starkmha.org 3. In Person at: 400 E. Tuscarawas St. Canton. OH 44702
HOW TO FULLY RESPOND TO THIS IFB	Submit 1 unbound original ("hard copy") and 1 electronic copy of your bid to AT Procurement & Contracting Department in the format as described under Section 5.0, Bid Format. Use the submittal checklist (Form of Bid- Appendix B) on page 28.
DATE ISSUED	May 5, 2022
Pre-Bid Meeting	May 18, 2022 at 1:00 PM (EST) Alliance Senior Tower 350 S. Arch Avenue, Alliance, OH 44601
Q&A DEADLINE	May 25, 2022 by 12:00 PM (EST)
BONDING REQUIREMENTS	Bid Bond: 10% of the Bid Price (included with the Bid Submittal) Payment & Performance Bond: 100% of the contract price, <u>upon contract execution.</u>
BID SUBMITTAL RETURN & DEADLINE	June 8, 2022 by 2:00 PM (EST) AT Director of Procurement 400 Tuscarawas St. East Canton, OH 44702

ANTICIPATED AWARD DATE	June, 2022
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INVITATION FOR BIDS

1.0 **GENERAL INFORMATION:**

- 1.1 Statement of Purpose:** The Alliance Tower and its affiliated entities (AT) are seeking sealed bids from qualified, licensed Contractors with demonstrated competence and experience to provide all labor and materials for Renovation at Alliance Tower Project as detailed in **the attached Scope of Work**. Project will be awarded to the contractor which offers the lowest overall cost to AT.
- 1.2** Prospective Bidders acknowledge by downloading and receiving the IFB documents and/or by submitting a bid to AT is not a right by which to be awarded a contract, but merely is an offer by the prospective Bidder to perform the requirements of the IFB documents in the event AT decides to consider to award a contract to that Bidder.
- 1.3 Bidder's Responsibilities- Contact with AT:** It is the responsibility of the Bidder to address all communication and correspondences pertaining to this IFB process to AT contact person listed herein only. Bidders must not make inquiry or communicate with any other AT staff member or official (including members of the Board of Commissioners) pertaining to this IFB. Failure to abide by this requirement may be cause for AT to not consider a bid submittal received from any Bidder who has not followed this directive during the IFB solicitation process. The AT will not conduct any ex parte conversations which may give one perspective Bidder and advantage over other prospective Bidders.
- 1.4 Type of Contract resulting from this IFB:** Firm Fixed-Price Contract.

2.0 **AT'S RESERVATION OF RIGHTS:**

- 2.1** AT reserves the right to reject any or all bids, to waive any informality in the IFB process, or to terminate the IFB process at any time, if deemed by AT to be in its best interest.
- 2.2** AT reserves the right not to award a contract pursuant to this IFB.
- 2.3** AT reserves the right to terminate a contract awarded pursuant to this IFB, at any time for its convenience upon 14 days written notice to the successful Bidder(s).
- 2.4** AT reserves the right to determine the days, hours and locations that the successful Bidder(s) shall provide the services called for in this IFB.
- 2.5** AT reserve the right to retain all bids submitted and not permit withdrawal until October 31, 2022 without written consent from AT.
- 2.6** AT reserves the right to reject and not consider any bid that does not meet the requirements of this IFB, including but not necessarily limited to incomplete bids and/or bids that offering alternate or non-requested services.

- 2.7** AT shall have no obligation to compensate any Bidder for any costs incurred in responding to this IFB.
- 2.8** AT reserves the right to, at any time during the IFB or contract process, prohibit any further participation by a Bidder or reject any bid submitted that does not conform to any of the requirements detailed herein. Each prospective Bidder further agrees that he/she will inform AT in writing within five (5) days of the discovery of any item that is issued thereafter by AT that he/she feels needs to be addressed. Failure to abide by this timeframe shall relieve AT, but not prospective Bidders, of any responsibility pertaining to such issue.
- 2.9** AT reserves the right, prior to award, to revise, change, alter or amend any of the instructions, terms, conditions, and/or specifications identified within the IFB documents issued, within any attachment or drawing, or within any addenda issued. All addenda will be posted on AT's website (www.starkmha.org) and such changes that are issued before the bid submission deadline shall be binding upon all prospective Bidders.
- 2.10** In the case of rejection of all bids, AT reserves the right to advertise for new bids or to proceed to do the work otherwise, if in the judgement of AT, the best interest of AT will be promoted.
- 2.11** AT reserves the right to, without liability; cancel the award of any bid(s) at any time before execution of the contract documents by all parties.
- 2.12** AT reserves the right to reduce or increase estimated or actual quantities in whatever amount necessary without prejudice or liability to AT, if:
- 2.12.1** Funding is not available
- 2.12.2** Legal restrictions are placed upon the expenditure of monies for this category of services or supplies; or
- 2.12.3** AT's requirements in good faith change after award of the contract, documents issued, within any attachment or drawing, or within any addenda issued. All addenda will be posted on AT's website (www.starkmha.org) and such changes that are issued before the bid submission deadline shall be binding upon all prospective Bidders.
- 2.13** Intentionally Left Blank
- 2.14** AT reserves the right to require additional information from all proposers to determine level of responsibility. Such information shall be submitted in the form required by AT within two (2) days or written request.
- 2.15** AT reserves the right to amend the contract any time prior to contract execution.
- 2.16** AT reserves the right to require the Contractor to keep accurate timesheets for all employees assigned to perform any project, task, or assignment resulting from this IFB and any resulting contract.
- 2.17** AT reserves the right to contact any individuals, entities, or organizations that have had business relationships with the proposer regardless of their inclusion in the reference section of the proposal submitted.
- 2.18** In the event any resulting contract is prematurely terminated due to non-performance and/or withdrawal by the Contractor, AT reserves the right to seek monetary restitution (to include but not limited to withholding of monies owed) from the Contractor to cover costs for interim service and/or cover the difference of a higher cost (difference between terminated Contractor's rate and

the new company's rate) beginning the date of Contractor's termination through the contract expiration date.

2.19 AT reserves the right to award all, part, or none of the materials and/or services specified in this IFB as determined to be in the best interest of AT.

2.20 INTENTIONALLY LEFT BLANK

3.0 **GENERAL CONDITIONS:**

3.1 The Contractor shall provide labor and materials to provide Renovation at Alliance Tower per the enclosed specifications/statement of work (**see attached Scope of Work**).

3.2 **Regulatory:** Contractor shall comply with all applicable federal, state, and local laws, rules, regulations, ordinances and codes and obtain any licenses or permits required to provide the services under this IFB. This would include any Americans with Disabilities Act (ADA) and Uniform Federal Accessibility Standard (UFAS) standards.

3.3 **Misclassification of Employees as Independent Contractors:** Per the United States Department of Labor Requirements, as detailed in *Administrator's Interpretation No. 2015-1*, when using Federal Funds, it is necessary to assure all employees are classified correctly and paid accordingly. Misclassification creates an unfair advantage in favor of those employers who are not properly classifying their workers and results in lower tax revenue for the government. To ensure correct classifications, wages and tax revenues are paid and reported any documentation submitted to AT indicating or suspected to indicate an Independent Contractor or Contractor using an IRS1099 Form shall be further investigated by AT. It shall be the burden of the Contractor to provide any documentation requested by AT. For more information on the Misclassification of Employees as Independent Contractors please visit: www.dol.gov/whd/workers/misclassification/.

3.4 **Licensing:** Contractor shall be licensed as required by the jurisdiction in which the service is to be performed and the license shall be current and in good standing.

3.5 **Bid Prices:** Bidders are advised that the Fees shall be all inclusive and fully burdened to accomplish the work as specified in this IFB and any resulting contract.

3.6 **Contractor will be required to prepare and submit monthly reports on Section 3.** Contractor shall utilize Section 3 residents and businesses as defined to perform the requirements under this bid to the greatest extent feasible and shall document such efforts monthly (when applicable).

3.7 **Contractor shall provide at Contractor's own expense all equipment, labor, materials, supplies, and tools to perform all the services required under this IFB and any resulting contract.**

3.8 **Contractor shall perform criminal history checks and drug screening tests on all employees performing work under this IFB and any resulting contract and if requested provide summaries of the results to AT. Prospective employees whose criminal history checks discloses a misdemeanor or felony conviction involving crimes of moral turpitude or harm to persons or property shall not be used to perform work under this IFB or any resulting contract. Contractor is required to perform drug screening of all employees and to ensure acceptable test results. Criminal history and drug screening checks will be completed at the sole expense of the Contractor.**

3.8.1 ALL AT PROPERTIES ARE SMOKE FREE. CONTRACTOR IS RESPONSIBLE FOR ASSURING THEIR EMPLOYEES ABIDE BY THIS.

- 3.9 Liquidated Damages:** For each day that performance under a contract resulting from this IFB is delayed beyond the time specified for completion, the successful Bidder shall be liable for liquidated damages in the amount of \$1000.00 per day. However, the timeframe for performance may be adjusted at AT's discretion in writing and received by the successful Bidder prior to default under any resulting contract.
- 3.10** If any employee of the Contractor is deemed unacceptable by AT, Contractor shall immediately replace such personnel with a substitute acceptable to AT.
- 3.11** Contractor shall provide uniforms and ID badges for all employees working on AT's properties. No employee will be allowed on AT's properties out of uniform and without an ID badge.

4.0 CONDITIONS TO BID:

- 4.1 Pre-Qualification of Bidders:** Prospective Bidders will not be required to pre-qualify in order to submit a bid. However, all Bidders will be required to submit adequate information showing the Bidder is qualified to perform the required work (i.e. Vendor Registration Form [see attached **Vendor Registration Forms**]). Failure by the prospective Bidder to provide the requested information may, at AT's discretion, eliminate that Bidder from consideration, provided that all Bidders were required to submit the same information.

4.2 IFB Forms, Documents, Specifications, and Drawings

- 4.2.1** Prior to submitting a bid in response to this IFB, it shall be each prospective Bidder's responsibility to examine carefully and, as may be required, properly completed all documents issued pursuant to this IFB.
- 4.2.2** Unless otherwise instructed, specifications and drawings (if provided) do not purport to show all of the exact details of the work. They are intended to illustrate the character and extent of the performance desired under the proposed contract and may be supplemented or revised from time to time.
- 4.2.3** Catalogs, brand names or manufacturer's references are provided for descriptive purposes only and indicates the type and quality desired. Bids on brands of like nature and quality will be considered unless specified otherwise. If bidding other than references, bid submittal shall show manufacturer, brand or trade name, and other description of product offered. If other than brand(s) specified is offered, illustrations and complete description of products offered must be included in the bid submittal. Failure to take exception to specifications will require Contractor to furnish specified brand names, numbers, etc.

4.3 Submission and Receipts by AT:

- 4.3.1 Time for Receiving Bids:** Bids received prior to the bid submittal deadline shall be securely kept, unopened, by AT until the due date and time. No bid received after the designated deadline shall be considered.

- 4.3.1.1 Bidders** are cautioned that any bid submittal that is time stamped as being received by AT after the exact time set as the deadline for receiving of bids shall not be considered. Any such bids inadvertently opened shall be ruled to be invalid. No responsibility will attach to AT or any official or employee

thereof, for the pre-opening of, or failure to open a bid not properly addressed and identified.

- 4.3.1.2** A total of one (1) original unbound signature copy (“hard copy”) **and** one (1) electronic (CD) copy **shall** be placed unfolded in a sealed package with the Bidder’s name and return address and addressed as follows:

**Stark Metropolitan Housing Authority
Attn: Director of Procurement
400 Tuscarawas Street East
Canton, Ohio 44702**

IFB# 042520221

Due Date and Time: June 8, 2022, 2:00 PM (EST)

Bidders may choose to respond to this bid through AT’s e-Procurement website, Housing Authority Marketplace in lieu of providing hard copy response.

- 4.3.2 Withdrawal of Bids:** Bids may be withdrawn as detailed within Form HUD-5369, *Late Submissions, Modifications and Withdrawal of Bids*. Negligence on the part of the Bidder preparing his/her bid confers no right of withdrawal or modification of his./her bid after such bid has been received and opened.

- 4.3.2.1 Procedure to withdraw Bid submittal:** A request for withdrawal of a bid due to a purported error need not be considered by AT unless filed in writing by the Bidder within 48 hours after the bid deadline. Any such request shall contain a full explanation of purported error and shall, if requested by AT, be supported by the original calculations on which the bid was computed, a certification and notarization thereon that such computation is the original and was prepared by the Bidder or his/her agent, who must be identified on the notarized form. The foregoing shall not be construed that such withdrawal will be permitted, as AT retains the right to accept or reject any proposed withdrawal for a mistake.

4.4 Exceptions to Specifications:

- 4.4.1** A prospective Bidder may take exception to any of the bid documents or any part of the information contained therein, by submitting, in writing to AT, at least seven (7) days prior to the bid submission deadline, a complete and specific explanation as to what he/she is taking exception. Proposed alternate documents or information must be included. AT reserves the right to agree with prospective Bidder and issue a revision to the applicable requirements, or may reject the prospective Bidder’s request.
- 4.4.2** When taking exception, prospective Bidders must propose services that meet the requirements of the IFB documents. Exceptions to the specifications and/or approved “equal” requests may be discussed at the scheduled pre-bid conference (if scheduled). All verbal instructions issued by AT officers not already listed within the IFB documents shall only become official when issued as addenda or as a written answer issued pursuant to receipt of a written question.

5.0 BID FORMAT:

5.1 **THE BID (TAB 1 TO TAB 13) SHALL BE SUBMITTED IN ONE (1) SEALED ENVELOPE. SUBMIT ONE (1) UNBOUND ORIGINAL (“HARD COPY”) AND ONE (1) ELECTRONIC COPY (CD) OF YOUR BID.** Bid sealed envelopes must be addressed as detailed in 4.3.1.2 and include the Bidder’s Company name in the upper left corner. Failure to submit the bid in the manner specified may result in a premature opening of, post-opening of, or failure to open and consider that bid, and may, at the discretion of AT, eliminate that Bidder from consideration or award. **You may also respond to this bid through the e-procurement site “Housing Agency Marketplace” which is the preferred method for contractors to receive bid information and respond. If you require information as to how to register, please contact me at adetota@starkmha.org.**

5.2 **Required Forms:** All required forms furnished by AT as a part of this IFB shall, as instructed, be fully completed and submitted by the Bidder. Such forms may be completed in a legible hand-written fashion, by use of a typewriter, or may be downloaded and completed on a computer. If, during the download, a form becomes changed in any fashion, the Bidder must “edit” the form back to its original form (for example, signature lines must appear on the page which the line was originally intended).

5.3 **Tabbed Bid Submittal:** AT intends to retain the successful Bidder pursuant to a “Best Value” basis, not a “Low Bid” basis. Therefore, so that AT can properly evaluate the bids received, **all bids submitted in response to this IFB shall be formatted in accordance with the sequence noted below (Tab 1 to Tab 13).** Do not omit any tabs, if the information requested does not apply please put “Not Applicable” under the accompanying tab in the submittal. **FAILURE TO SUBMIT ALL REQUIRED INFORMATION MAY RESULT IN DISQUALIFICATION OF THE BID SUBMITAL FROM CONSIDERATION FOR AWARD.**

Each category shall be separated by numbered index dividers and the number on the index divider must extend so that each tab can be located without opening the bid and labeled with the corresponding tab reference noted below. None of the proposed services may conflict with a requirement AT has published herein or has issued by addendum.

5.3.1 **TAB 1 FORM OF BID:** This Form is attached hereto as **Appendix A** to this IFB document. This one-page Form shall be fully completed, executed where provided, and submitted under this tab as part of the bid submittal.

5.3.2 **TAB 2 BID FEE SHEET:** This Form is attached to this IFB packet. This Form shall be fully completed, including acknowledgement of addendum/HUD Forms/Section 3 Preference, and submitted under this tab as a part of the bid submittal.

5.3.3 **TAB 3 BID BOND:** For construction contracts exceeding \$50,000.00 Bidders shall be required to submit a bid guarantee equivalent to 10% of the bid price. AT’s Bid Bond Form (**attached**) shall be fully completed, executed where provided there on and submitted under this tab as a part of the bid submittal.

5.3.4 **TAB 4 BIDDER’S CERTIFICATION FORM:** This Form is attached hereto as **Appendix B** to this IFB document and must be fully completed, executed where provided thereon and submitted under this tab as a part of the bid submittal.

5.3.5 **TAB 5 SECTION 3 EXPLANATION:**

5.3.5.1 **Section 3 Clause:** Be aware that the Agency previously conducted IFB’s that required bidders and contractors to comply with the requirements of 24 CFR §135, Economic Opportunities for Low- and Very Low-Income Persons (a.k.a., Section

3). However, last year the U.S. Department of Housing and Urban Development (HUD) discontinued these former requirements and implemented the requirements of 24 CFR §5, 14, 75, 91, 92, 93, 135, 266, 570, 574, 576, 578, 905, 964, 983, and 1000, entitled Enhancing and Streamlining the implementation of Section 3 Requirements for Creating Economic Opportunities for Low- and Very Low-Income Persons and Eligible Businesses. Accordingly, these new Section 3 regulations do not provide for a firm proposing to provide services to a housing agency to immediately submit any information pertaining to Section 3, including the new regulations do not provide for the granting of any preferences to Section 3 firms submitting bids. The Agency will advise all firms if these requirements change.

5.3.5.2 NOTE: Please see Appendix C Sample Contract Language regarding Low-income Resident Hiring Plan, which the successful bidder(s) will be required to execute and abide by.

5.3.5.3 INTENTIONALLY LEFT BLANK

5.3.6 INTENTIONALLY LEFT BLANK

5.3.7 TAB 7 LIST OF PAST PERFORMANCE/EXPERIENCE/CLIENT INFORMATION: This Form is attached hereto as **Appendix G** to this IFB document and must be fully completed, executed where provided thereon, if applicable, and submitted under this tab as a part of the bid submittal. The Bidder must submit under this tab a concise description of past performance, experience and client information in performing similar contract work substantially similar to that required by this solicitation. The Bidders shall submit three (3) former or current clients, preferably other than AT, for whom the Bidder has performed similar or like services to those being proposed herein.

5.3.8 TAB 8 LIST OF SUB-CONTRACTORS/JOINT VENTURE INFORMATION: The Bidder shall identify, on the Form attached hereto as **Appendix H** to this IFB document, whether or not he/she intends to use any sub-contractors for this job, if awarded, and/or if the bid is a joint venture with another firm. A Contractor Profile Form (**Appendix I**) shall be provided for each sub-contractor and/or joint venture firm, and any accompanying sub-contractor/joint venture Contractor Profile Forms shall be completed and submitted under this tab as part of the bid submittal.

5.3.9 TAB 9 COPY OF BUSINESS LICENSE: The Bidder shall submit a copy of their current business license. At a minimum, this shall include documentation demonstrating eligibility to do business within the State of Ohio (i.e. Articles of Incorporation). Any additional licenses can also be provided under this tab (i.e. local business license, etc.).

5.3.10 TAB 10 COPY OF INSURANCE CERTIFICATE: The Bidder shall submit a copy of their insurance certificate. If a Bidder receives an award and unless otherwise waived in the IFB documents, Contractor will be required to provide an original Certificate of Insurance confirming the minimum requirements of AT within 10 days of contract signature. The Insurance Certificate shall name AT as an additional insured.

5.3.11 TAB 11 COPY OF WORKMAN'S COMPENSATION CERTIFICATE: The Bidder shall submit a copy of their Workman's Compensation Certificate.

5.3.12 TAB 12 CONTRACTOR PROFILE FORM: This Form is attached hereto as **Appendix I** to this IFB document and must be fully completed, executed where provided thereon and submitted under this tab as a part of the bid submittal.

5.3.13 TAB 13 VENDOR REGISTRATION FORMS & W-9: The Vendor Registration Forms are attached to this IFB document. This Form must be fully completed, executed where provided, and submitted under this tab as a part of the bid.

6.0 BID OPENING:

- 6.1** It is understood by all Bidders/prospective Bidders that the bids are publically opened and the results will be a matter of public record.
- 6.2.1** All bid documents submitted by the Bidders are generally a matter of public record unless information is deemed to be proprietary.
- 6.2 Mistake in the Bid Submitted:** Unless otherwise prohibited within the IFB documents, a mistake in the unit cost pricing that does not affect the total cost sum submitted, may, at AT's discretion, be corrected by submitting a corrected cost form, together with a complete explanation in writing, of how the mistake occurred, to AT, for his/her review. This mistake must be corrected before the issuance of any contract documents. Such correction shall not operate to give any Bidder an advantage over another.
- 6.3 Irregular Bid Submittal:** A bid shall be considered irregular for any one of the following reasons, any one or more of which may, at AT's discretion, be a reason for rejection:
- 6.3.1** If the forms furnished by AT are not used or are altered or if the proposed costs are not submitted as required and where provided.
- 6.3.2** If all requested completed attachments do not accompany the bid submittal.
- 6.3.3** If there are unauthorized additions, conditional or alternate proposals, or irregularities of any kind which may tend to make the bid incomplete, indefinite or ambiguous as to its meaning or give the Bidder a competitive advantage over other Bidders.
- 6.3.4** If the Bidder adds any provisions reserving the right to accept or reject any award or to enter into contract pursuant to an award.
- 6.3.5** If the individual cost bid items submitted by a specific Bidder are unbalanced in the sense that the listed price of any cost item departs by more than 25% from AT's cost estimate for that item.
- 6.4 Disqualification of Bidders:** Any one or more of the following shall be considered as sufficient for disqualification of a prospective Bidder and the rejection of his/her bid:
- 6.4.1** Evidence of collusion among prospective Bidders. Participants in such collusion will receive no recognition as Bidders or Bidders for any future work with AT until such participant shall have been reinstated as a qualified Bidder or Bidders. The names of all participants in such collusion shall be reported to HUD and any other inquiring governmental agency.
- 6.4.2** More than one bid for the same work from an individual, firm, or corporation under the same or different name(s).
- 6.4.3** Lack of competency, lack of experience and/or lack of adequate machinery, plan and/or other resources.
- 6.4.4** Unsatisfactory performance record as shown by the past work for AT or with any other local, state or federal agency, judged from the standpoint of workmanship and progress.

- 6.4.5 Incomplete work, which in the judgement of AT, might hinder or prevent prompt completion of additional work, if awarded.
- 6.4.6 Failure to pay or satisfactorily settle all bills due on former contracts still outstanding at the time of letting.
- 6.4.7 Failure to comply with any qualification requirements of AT.
- 6.4.8 Failure to list, if required, all subcontractors (if subcontractors are allowed by AT) who will be employed by the successful Bidder(s) to complete the work of the proposed contract.
- 6.4.9 As required by the IFB documents, failure of the successful Bidder to be properly licensed by the City, County and/or State of Ohio and/or to be insured by a commercial general liability policy and/or workman's compensation policy and/or business automobile liability policy, if applicable.
- 6.4.10 Any reason to be determined in good faith, to be in the best interest of AT.

6.5 Award of Bid(s): The successful Bidder shall be determined by the top-rated responsive and responsible Bidder as determined by "Best Value", provided his/her bid is reasonable and within budget, he/she is able to deliver the specified items in a timely manner and it is, in the opinion of AT, in the best interest of AT to accept the bid. **During the bid review, the apparent low bidder may be asked to provide a Schedule of Values for the bid consistent with AIA Form G702 and G703 for review.**

7.0 INSURANCE:

7.1 If a Bidder receives an award, the Contractor will be required to provide an original Certificate of Insurance confirming the following minimum requirements to AT within 10 days of contract signature:

Professional Liability	Required Limits
AT and its affiliates must be named as an Additional Insured and be a Certificate Holder. This is required for vendors who render observational services to AT such as appraisers, inspectors, attorneys, engineers or consultants.	\$ 1,000,000.00
Business Automobile Liability	Required Limits
AT and its affiliates must be named as an additional insured and as the certificate holder. This is required for any vendor that will be using their vehicle to do work on AT properties.	\$500,000.00 combined Single limit, per occurrence
Workers' Compensation and Employer's Liability	Required Limits
Workers' Compensation coverage is Statutory and has no pre-set limits. Employer's Liability limit is \$500,000. Workers' Compensation is required for any vendor made up of more than one person. A Waiver of Subrogation in favor of SAHD must be included in the Workers' Compensation policy. AT and its affiliates must be a Certificate Holder.	Statutory \$500,000.00
Commercial General Liability	Required Limits
This is required for any vendor who will be doing hands on work at AT properties. AT and its affiliates must be named as an Additional Insured and as the Certificate Holder.	\$1,000,000.00 per accident \$2,000,000 aggregate

8.0 RIGHT TO PROTEST:

8.1 Rights: Any prospective or actual Bidder, offeror, or contractor who is allegedly aggrieved in connection with the solicitation of a bid or award of a contract, shall have the right to protest. Such right only applies to deviations from laws, rules, regulations, or procedures.

8.1.1 Definition: An alleged aggrieved “protestant” is a prospective Bidder or Bidders who feels that he/she has been treated inequitably by AT and wishes AT to correct the alleged inequitable condition or situation.

8.1.2 Eligibility: To be eligible to file a protest with AT pertaining to an IFB or contract, the alleged aggrieved protestant must have been involved in the IFB process in some manner as a prospective Bidder (i.e. recipient of the IFB documents) when the alleged situation occurred. AT has no obligation to consider a protest filed by a party that does not meet these criteria.

8.1.3 Procedure: Any actual or prospective Bidder may protest the solicitation or award of a contract for material violation of AT’s Procurement Policy. Any protest against a AT solicitation must be received before the due date for receipt of bids and any protest against the award of a contract must be received within ten calendar days after contract award or the protest will not be considered.

Protests shall state the reason(s) why the award is being protested and provide supporting evidence for the protest. All formal protests shall be in writing, submitted to the Contracting Officer. The Contracting Officer will date stamp the protest and notify the contractor in writing that the protest was received within the required time and will be reviewed. If the protest was not filed within the required time, the Contracting Officer will notify the contractor in writing that the protest is ineligible for consideration. The Contracting Officer will within 60 days from receipt, review and decide the protest or notify the contractor in writing of the date the decision will be made. The Contracting Officer will prepare a response to each issue listed in the protest. AT’s Legal Counsel may review the protest and the decision before the decision is rendered to the contractor. The Contracting Officer may, at his/her discretion, suspend the procurement pending resolution of the protest, if warranted by the facts presented.

9.0 DISPUTES UNDER THE CONTRACT:

9.1 Procedures: In the event that any matter, claim, or dispute arises between the parties, whether or not related to this IFB or any resulting contract, both parties shall be subject to non-binding mediation if agreed to by both parties within thirty (30) days of either party making a request in writing. The parties further agree that if the matter, claim or dispute is not settled during mediation, it shall thereafter be submitted to binding arbitration. The parties shall make a good-faith attempt

to mutually agree upon an arbitrator. If the parties cannot mutually agree upon an arbitrator after reasonable efforts have been exerted, then the matter, claim or dispute shall be submitted to the American Arbitration Association for final and binding arbitration. Unless extended by the arbitrator for good cause shown, the final arbitration hearing shall begin no later than two months after the selection of the arbitrator.

10.0 ADDITIONAL CONSIDERATIONS:

- 10.1 Required Permits and Licenses:** Unless otherwise stated in the IFB documents, all Federal, State or Local permits and licenses which may be required to provide the services ensuing from any award of this IFB, whether or not they are known to either AT or the Bidders at the time of the bid submittal deadline or the award, shall be the sole responsibility of the successful Bidder(s) and all offers submitted by the Bidder shall reflect all costs required by the successful Bidder(s) to procure and provide such necessary permits or licenses.
- 10.2 Taxes:** AT, a governmental entity, is exempt from Ohio State Sales and Use Taxes and Federal Excise Taxes. A letter of Tax Exemption will be provided upon request.
- 10.3 Governmental Standards:** It is the responsibility of the prospective Bidder to ensure that all items and services proposed conform to all Local, State and Federal laws concerning safety (OSHA) and environmental control (EPA and Stark County Pollution Regulations) and any other enacted ordinance, code, law or regulation. The successful Bidder(s) shall be responsible for all costs incurred for compliance with any such possible ordinance, code, law or regulation. No time extensions shall be granted or financial consideration given to the successful Bidder(s) for time or monies lost due to violations of any such ordinance, code, law or regulation that may occur.
- 10.4 Delivery:** All costs submitted by the successful Bidder(s) shall reflect the cost of delivering the proposed items and/or services to the locations specified within the IFB documents or within the Agreement. All costs in the bid submittal shall be quoted as Free on Board (FOB) Destination, Freight Prepaid and allowed unless otherwise stated in this IFB.
- 10.4.1** The successful Bidder(s) agrees to deliver to the designated location(s) on or before the date as specified in the finalized contract. Failure to deliver on or before the specified date constitutes and event of default by the successful Bidder. Upon default, the successful Bidder(s) agrees that AT may, at its option, rescind the finalized contract under the termination clause herein and seek liquidated damages as provided by law.
- 10.5 Work on AT Property:** If the successful Bidder's work under the contract involves operations on AT premises, the successful Bidder(s) shall take all necessary precautions to prevent the occurrence of any injury to persons or property during the progress of such work and shall immediately return said property to a condition equal to or better than the existing condition prior to the commencement of work at the site at no cost to AT.
- 10.6 Estimate Quantities:** Unless otherwise indicated, the quantities shown are estimates only and are used to evaluate the responses and may or may not reflect anticipated purchases. AT does not guarantee any minimum purchase quantity.
- 10.7 Warranty:** All items installed/provided under any contract resulting from this IFB must include a minimum of a one (1) year warranty including labor and installation plus a minimum of a one (1) year warranty from the Contractor for labor, materials and installation except as specified otherwise herein. This period will begin on the date of "FINAL" acceptance by AT. This does not overrule the product guarantees.

- 10.7.1** The services provided under the contract shall conform to all information contained within the IFB documents as well as applicable Industry Published Technical Specifications, and if one of the above mentioned specifications contains more stringent requirements than the other, the more stringent requirements shall apply.
- 10.7.2** In addition to all other warranties, the warranty shall include the warranty for merchantability and the warranty of fitness for a particular purpose.
- 10.7.3 Assignment of Warranty:** Contractor shall assign any warranties and guarantees to AT and provide the Contractor's Warranty for Labor and Installation to AT along with all Manufacturers' Warranty documents.
- 10.8 Official, Agent and Employees of AT Not Personally Liable:** It is agreed by and between the parties hereto that in no event shall any official, officer, employee or agent of AT in any way be personally liable or responsible for any covenant or agreement herein contained whether expressed or implied, nor for any statement, representation or warranty made herein or in any connection with this agreement.
- 10.9 Subcontractors:** Unless otherwise stated within the IFB documents, the successful Bidder(s) may not use any subcontractors to accomplish any portion of the services described within the IFB documents or the contract **without the prior written permission of AT**. Also, any substitution of subcontractors must be approved in writing by AT prior to their engagement.
- 10.9.1** "Prime" Contractor shall provide completed Contractor Profile Forms (**Appendix I**), for all subcontractors being proposed to work under this IFB or any resulting contract. AT must review and approve, in writing, the use of all subcontractors.
- 10.9.2** All requirements for the "Prime" Contractor shall also apply to any and all subcontractors. Regardless of subcontracting, the Prime Contractor remain liable to AT for the performance under this IFB or any resulting contract.
- 10.9.3** "Prime" Contractor will be required to submit copies of their contracts with any approved subcontractors to AT.
- 10.10 Salaries and Expenses Relating to the Successful Bidder's Employees:** Unless otherwise stated within the IFB documents, the successful Bidder shall pay all salaries and expenses of, and all Federal, Social Security taxes, Federal and State Unemployment taxes, and any similar taxes relating to its employees used in the performance of the contract. The successful Bidder further agrees to comply with all Federal, State and Local wage and hour laws and all licensing laws applicable to its employees or other personnel furnished under this agreement.
- 10.11 Independent Contractor:** Unless otherwise stated within the IFB documents or in the contract, the successful Bidder is an independent contractor. Nothing herein shall create any association, agency, partnership or joint venture between the parties hereto and neither shall have any authority to bind the other in any way.
- 10.12 Severability:** If any provision of this agreement or any portion or provision hereof applicable to any particular situation or circumstance is held invalid, the remainder of this agreement or the remainder of such provision (as the case may be), and the application thereof to other situations or circumstances shall not be affected thereby.
- 10.13 Waiver of Breach:** A waiver of either party of any terms or conditions of this agreement in any instance shall not be deemed or construed as a waiver of such terms or conditions for the future, or of any subsequent breach thereof. All remedies, rights, undertakings, obligations and

agreements contained in this agreement shall be cumulative and none of them shall be in limitation of any other remedy, right, obligation or agreement of either party.

- 10.14 Time of the Essence:** Time is of the essence as to each provision in which a timeframe for performance is provided in this IFB. Failure to meet these timeframes may be considered a material breach, and AT may pursue compensatory and/or liquidated damages under the contract.
- 10.15 Limitation of Liability:** In no event shall AT be liable to the successful Bidder(s) for an indirect, incidental, consequential or exemplary damages.
- 10.16 Indemnity:** The Contractor shall indemnify and hold harmless AT and its officers, agents, representatives and employees from and against all claims, losses, damages, actions, causes of action and/or expenses resulting from, brought for or on account of any bodily injury or death of an employee of the Contractor, its agents or its subcontractors of any tier received or sustained by any persons or property growing out of, occurring or attributable to any work performed under or related to this agreement, resulting in whole or in part from the negligent acts or omissions of the Contractor, an subcontractors, or an employee, agent or representative of the Contractor or any subcontractors, **AND REGARDLESS OF WHETHER CAUSED IN WHOLE OR IN PART BY THE NEGLIGENCE OF AT. CONTRACTOR ACKNOWLEDGES AND AGREES THAT THIS INDEMNITY CONTROLS OVER ALL OTHER PROVISIONS OF THIS AGREEMENT, SURVIVES TERMINATION OF THIS AGREEMENT AND APPLIES TO CLAIMS AND LIABILITY ARISING OUT OF THE SOLE OR CONCURRENT NEGLIGENCE OF AT.**

Contractor shall indemnify and hold harmless AT, their agents, consultants and employees from and against any and all property damage claims, losses, damages, costs and expenses relating to the performance of this Agreement, including any resulting loss of use, *but only to the extent caused by the negligent acts or omissions of Contractor*, its employees, subcontractors, suppliers, manufacturers or other persons or entities for whose acts Contractor may be liable.

- 10.17 Public/Contracting Statutes:** AT is a governmental entity as that term is defined in the procurement statutes. AT and this IFB and all resulting contracts are subject to Federal, State and Local laws, rules, regulations and policies relating to procurement.
- 10.18 Termination:** Any contract resulting from this IFB may be terminated under the following conditions:
- 10.18.1** By mutual consent if both parties, and
- 10.18.2 Termination for Cause:** As detailed within the attached/referenced HUD Forms.
- 10.18.2.1** AT may terminate any and all contracts for default at any time in whole or in part, if the Contractor fails to perform any of the provisions of any contract, fails to pursue the work as to endanger performance in accordance with the terms of the IFB or any resulting contracts, and after receipt of written notice from AT, fails to correct such failures within seven (7) days or such other period as AT may authorize or require.
- 10.18.2.1.1** Upon receipt of a notice of termination issued from AT, the Contractor shall immediately cease all activities under any contract resulting from this IFB unless expressly directed otherwise by AT in the Notice of Termination.

10.18.2.1.2 AT may terminate any contract resulting from this IFB in whole or in part, if funding is reduced, or is not obtained and continued at levels sufficient to allow for the expenditure.

10.18.3 Termination for Convenience: AT may terminate for convenience on a unilateral basis when the product or services is no longer needed or when it is in the best interest of AT.

10.18.4 The rights and remedies of AT provided under this section are not exclusive and are in addition to any other rights and remedies provided by law or under any contract.

10.18.5 In the event the resulting contract from this IFB is terminated for any reason, or upon its expiration, AT shall retain ownership of all work products including deliverables, source and object code, microcode, software licenses, and documentation in whatever form that may exist. In addition to any other provision, the Contractor shall transfer title and deliver to AT any partially completed work products, deliverables, source and object code, or document that the Contractor has produced or acquired in the performance of any resulting contract.

10.19 Examination and Retention of Contractor's Records: AT, HUD, Comptroller General of the United States, or any of their duly authorized representatives shall, until three (3) years after final payment under all contracts executed as a result of this IFB, 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 audits, examinations, excerpts or transcriptions.

10.20 Invoicing (if applicable): Contractor will only be allowed to invoice for the cost of services/goods in compliance with his/her bid.

10.20.1 Invoices must contain a complete description of the work or service that was performed, the contract price for service, the purchase order number, contract number (if applicable), and date of service and address of service location or delivery address.

10.20.2 Contractor must submit a separate invoice for each purchase order issued by AT unless prior approval is obtained from AT. **Contractor must submit invoice within thirty (30) days after delivery of goods and/or services. If Contractor fails to invoice within thirty (30) days after delivery of goods and/or services, AT reserves the right to not pay the invoice.**

10.20.3 If applicable, AT may make progress payments approximately every thirty (30) days as the work proceeds if work meets owner's standards, as approved by the AT staff. AT may, subject to written determination and approval of the Procurement & Contracting Manager, make more frequent payments to Contractor which are qualified small business in accordance with HUD documents.

10.20.4 If offered by Contractor, AT seeks a discount for early payment. AT shall only take such a discount if earned.

10.20.5 Payments made under the awarded contract will be made electronically by ACH, and will require additional documents to be set up for the ACH payments.

10.20.6 Unless utilizing a progress payment schedule invoices/requests for payments shall be sent to the following address:

Stark Metropolitan Housing Authority
Attn: Finance
400 Tuscarawas Street East
Canton, Ohio 44702

10.21 Inter-local Participation:

10.21.1 AT may from time to time enter into inter-local Cooperation Purchasing Agreements with other governmental entities or governmental cooperatives (hereafter collectively referred to as “Entity” or “Entities”) to enhance AT’s purchasing power. At AT’s sole discretion and option, AT may inform other Entities that they may acquire items listed in this IFB. Such acquisition(s) shall be at the prices stated herein, and shall be subject to Contractor’s acceptance.

10.21.2 In no event shall AT be considered a dealer, remarketer, agent or other representative of Contractor or Entity. Further, AT shall not be considered and is not an agent; partner or representative of the Entity making purchases hereunder, and shall not be obligated or liable for any such order.

10.21.3 Purchase orders shall be submitted to Contractor by the individual entity.

10.21.4 AT shall not be liable or responsible for any obligation, including but not limited to, payment and for any item or service ordered by an Entity, other than AT.

10.22 Right to Data and Patent Rights: In addition to ownership and use rights AT shall have exclusive ownership of all, proprietary interest in, and the right to full and exclusive of all information, materials, documents, software, and all electronic data discovered or produced by Contractor or sub-contractor(s) pursuant to the terms of any resulting contracting, including but not limited to, reports, memoranda or letters concerning the research and reporting tasks of any resulting contract. Both parties agree to comply with HUD Bulletin 909-23, which is the Notice of Assistance Regarding Patent and Copyright Infringement.

10.23 Lobbying Certification: By proposing to do business with AT or by doing business with AT, each Bidder certifies the following:

10.23.1 No Federally appropriated funds have been paid or will be paid, by or on behalf of the Bidder, to any person for influencing or attempting to influence an officer or employee of Congress, or an employee of a Member of Congress in connection with the awarding of any Federal contract, the making of any Federal grant, the making of any Federal loan, the entering into any cooperative agreement, and the extension, continuation, renewal, amendment or modification of any Federal contract, grant, loan or cooperative agreement.

10.23.2 If any funds other than Federally appropriated funds have been paid or will be paid to any person for influencing or attempting to influence an officer or employee of the agency, a Member of Congress, an officer or employee of Congress, in connection with this Federal contract, grant, loan, or cooperative agreement, the undersigned shall complete and submit Standard Form “Disclosure Form to Report Lobbying” in accordance with its instructions.

10.23.3 The successful Bidder shall require that the language of this certification be included in the award documents for all sub-awards at all tiers, (including but not limited to

subcontractors, sub-grants, and contracts under grants, loans, and cooperative agreements) and that all sub-recipients shall certify and disclose accordingly.

10.24 Applicable Statutes, Regulations & Orders: Contractor shall comply with all statutes, rules, regulations executive orders affecting procurements by Housing Authorities including but not limited to:

- 10.24.1** Executive Order 11246
- 10.24.2** Executive Order 11061
- 10.24.3** Copeland "Anti-Kickback" Act (18 USC 874)
- 10.24.4** Davis Bacon Act (40 USC 276a-276a-7)
- 10.24.5** Contract Work Hours & Safety Standards Act (40 USC 327-330)
- 10.24.6** Clean Air & Water Act (42 USC 1857(h); 33 USC 1368)
- 10.24.7** Energy Policy & Conservation Act (PL 94-163. 89 STAT 871)
- 10.24.8** Civil Rights Act of 1964, Title VI (PL 88-352)
- 10.24.9** Civil Rights Act of 1968, Title VII (PL 90-284 Fair Housing Act)
- 10.24.10** Age Discrimination Act of 1975
- 10.24.11** Anti-Drug Abuse Act of 1988 (42 USC 11901 et. Seq.)
- 10.24.12** HUD Information Bulletin 909-23
- 10.24.13** Immigration Reform & Control Act of 1986
- 10.24.14** Fair Labor Standards Act (29 USC 201 et. Seq.)

10.25 Additional Information: Each provision of law and each clause, which is required by law to be inserted in this IFB or any contract, shall be deemed to have been inserted herein, and this IFB and any resulting contract shall be read and enforced as though such provision or clause had been physically inserted herein. If, through mistake or otherwise, any such provision is not inserted or is inserted incorrectly, this agreement shall forthwith be physically amended to make such insertion or correction upon the application of either party. The aforementioned statutes, regulations and executive orders are not intended as an indication that such statute, regulation or executive order is necessarily applicable nor is an omission of such statute, regulation or executive order intended to indication that it is not applicable.

10.26 Conflicting Conditions: In the event there is a conflict between the documents comprising this IFB and any resulting contracts, the following order of precedence shall govern: (1) the more restrictive terms of either: any and all attached/referenced HUD forms and the terms/conditions in the body of any resulting contract; (2) the IFB; and (3) Contractor's Response. In the event that a conflict exists between any state statute or federal law the most restrictive terms shall apply.

10.27 Contract Form: AT will not execute a contract on the successful Bidder's form. Contracts will only be executed on AT's form. By submitting a bid, the successful Bidder agrees to this condition. However, AT will consider any contract clauses that the Bidder wishes to include therein, but the failure of AT to include such clauses does not give the successful Bidder the right to refuse to execute AT's contract form. It is the responsibility of each prospective Bidder to notify AT, in writing, with the bid submittal of any contract clauses that he/she is not willing to include in the

final execute contract. AT will consider such clauses and determine whether or not to amend the contract.

- 10.28 Contract:** Once contract is issued to successful bidder it needs to be signed and returned to AT within 2 business days. If not AT reserves the right to move to the next bidder in line.
- 10.29 Force Majeure:** Neither AT nor Contractor shall be held responsible for delays nor default caused by fire, flood, riots, acts of God or war where such cause was beyond, respectively, AT or Contractor's reasonable control. Contractor shall make all reasonable efforts to remove or eliminate such a cause of delay or default and shall, upon the cessation of the cause, diligently pursue performance of its obligations under this agreement.
- 10.30 Most Favored Customer:** The Contractor agrees that if during the term of any resulting contract, the Contractor enters into any agreement with any other governmental customer, or any non-affiliated commercial customer by which it agrees to provide equivalent services at lower prices, or additional services at comparable prices, the resulting contract at AT's option, will be amended to afford equivalent advantage to AT.
- 10.31 Lapse in Insurance Coverage:** In the event Contractor fails to maintain insurance as required by a resulting contract, the Contractor shall immediately cure such lapse in insurance coverage at the Contractor's expense, and pay AT in full for all costs and expenses incurred by AT under this contract as a result of the Contractor's failure to maintain insurance as required, including costs and reasonable attorney's fees relating to AT's attempts to cure such lapse in insurance coverage. Such costs and attorney fees, not to exceed fifteen hundred and 00/100 dollars (\$1,500.00), shall be automatically deducted from monies or payments owed to Contractor. Moreover, AT shall retain from monies or payments owe to Contractor by AT five percent (5%) of the value of the contract and place this retainage into an account to cover AT's potential exposure to liability during the period of such lapse. This retainage shall be held by AT until six (6) months after the term of the resulting contract has ended or has otherwise been terminated, cancelled or expired and shall be released if no claims are received or lawsuits filed against AT for any matter that should have been covered by the required insurance

11.0 WAGE RATE DETERIMATION

- 11.1 Davis-Bacon Prevailing Wage Rates:** For all applicable projects costing \$2,000.00 or more, AT must ensure that Contractor does not pay its employees that perform such work for AT at a rate less than the Davis-Bacon Act wage rates listed on Wage Determinations OnLine.gov (see below). Additionally, Contractor is required to pay employees weekly and submit weekly certified payroll reports to AT (see below). Therefore, by submitting a bid, each Bidder is thereby agreeing to and verifying that he/she will not pay his/her employees at rates less than detailed within the following table below or with less frequency than detailed herein. The Contractor will be required to submit certified payrolls; and must make its payroll records available to either AT or HUD on request, and failure on the part of the Contractor to comply with this requirement will be the sole responsibility of the Contractor, including any ensuing penalties, court costs, or wages due to employees as a result of the Contractor's failure to comply.

11.1.1 Wage Decision Website Link: <http://www.wdol.gov/dba.aspx>

11.1.2 Wage Decision: Renovation at Alliance Tower

11.1.2.1 Applicability- Building

11.1.2.2 General Decision Number: OH20220015

- 11.1.2.3 Counties Covered:** Carrol and Stark Counties in Ohio.
- 11.1.2.4 Wage Rates:** See **attachment** for applicable wage decision. This is a courtesy copy and is subject to change. The official wage decision for the project will be 'locked in' on the day of the bid opening. The wage decision pulled the day of the bid opening will be applicable for the life of the project UNLESS more than 90 days pass between bid opening and contract signing, at which point an updated wage decision for the project will be pulled. If this occurs, the wage decision pulled at contract signing will be applicable for the life of the project.
- 11.1.2.5 Employee Rights Poster:** The "Employee Rights" poster (**see attached**) shall be posted at the job site visible to all Contractor employees.
- 11.1.2.6 Certified Payroll Reports:** Certified payroll reports shall be submitted weekly to AT for projects subject to Davis-Bacon. The Form attached in this packet shall be used. Contractor is permitted to use their own certified payroll report if, and only if, **the form contains ALL OF THE EXACT information detailed on the form provided by AT.** Payrolls submitted to AT shall be originals, fully completed and executed in blue ink. Weekly certified payroll reports shall also be completed by all sub-contractors. It is the responsibility of the primary Contractor to collect, review and send the original certified payroll reports for all subcontractors to AT.

12.0 BONDING REQUIREMENTS

- 12.1 Bid Bond:** The Bid Bond shall be for ten percent (10%) of the bid sum of the total project, before any Deductive Alternates are eliminated. The Bid Bond shall be secured by a surety company authorized to do business in the state of Ohio and on the U.S. Treasury Circular Number 570. AT will also accept a Certified or Cashier's Check for five percent (5%) of the bid sum. The bid security, whether in the form of a Bid Bond, Certified Check or Cashier's Check, must be submitted with the bid. The Bid Bond shall be submitted on AT's Form (**Attached**).
 - 12.1.1 Successful Bidder(s):** Successful Bidder(s)' security will be retained until he/she has signed the contract and furnished the required Payment & Performance Bond.
 - 12.1.2 Unsuccessful Bidders:** Unsuccessful Bidders security will be returned upon contract execution with the successful Bidder(s).
- 12.2 Payment & Performance Bond:** The Payment & Performance Bond shall be for one hundred percent (100%) of the contract price and extend through one year guarantee period. The Payment & Performance Bond shall be secured by a surety company authorized to do business in the state of Ohio and on the U.S. Treasury Circular Number 570. The Housing Authority will also accept Separate Payment & Performance Bonds (each for one hundred percent (100%) or more of the contract price), a twenty percent (20%) Cash Escrow, or a twenty five percent (25%) irrevocable letter of credit. The bid security, whether in the form of a Payment & Performance Bond for one hundred percent (100%) of the contract price, Separate Payment & Performance Bonds (each for one hundred percent (100%) or more of the contract price), a twenty percent (20%) Cash Escrow, or a twenty-five percent (25%) Irrevocable Letter of Credit, must be submitted at the time of contract award.

Appendix A

Form of Bid

FORM OF BID

A1.0 Submittal Checklist:

- A.1. Instructions: THIS FORM IS MANDATORY AND SHALL BE FULLY COMPLETED AND SUBMITTED UNDER TAB 1 OF THE BID SUBMITTAL.** Unless otherwise specifically required, the items listed below shall be completed and included in the bid submittal. Descriptions of each requirement can be found in Section 5.0 Form of Bid. **Do not omit any tabs, if the information requested does not apply please put “Not Applicable” under the accompanying tab in the submittal. FAILURE TO SUBMIT ALL REQUIRED INFORMATION MAY RESULT IN DISQUALIFICATION OF THE BID SUBMITTAL FROM CONSIDERATION FOR AWARD.** Complete this form by marking an “X”, where provided, to verify that the referenced completed form or information has been included within the “hard copy” bid submittal submitted by the Bidder. Submit one (1) unbound original (the “hard copy”) and one (1) electronic copy (CD) of the following documents:

X	Tab #	Documents Required in Submittal	
	1	Form of Bid	Appendix A
	2	Bid Fee Sheet (including acknowledgement of Addenda & HUD Forms)	attached
	3	Bid Bond Template	attached
	4	Bidder’s Certification Form	Appendix B
	5	Section 3	Appendix C
	6	N/A	
	7	List of Past Performance/Experience/Client Information	Appendix G
	8	List of Sub-Contractors/Joint Venture Information	Appendix H
	9	Copy of Business License	-
	10	Copy of Insurance Certificate	-
	11	Copy of Workman’s Compensation Certificate	-
	12	Contractor Profile Form	Appendix I
	13	Vendor Registration Forms & W-9	attached

- A1.2** By signing below, the Bidder agrees that all of the aforementioned Tabs have been included in their bid submittal, and acknowledge that any of the required information, including this page, omitted from the bid submittal may result in their bid being disqualified from consideration for award.

Signature

Date

Appendix B

Bidder's Certification

BIDDER'S CERTIFICATION

By signing below, Bidder certifies that the following statements are true and correct:

- B1.0** He/she has full authority to bind Bidder and that no member of Proposer's organization is disbarred, suspended or otherwise prohibited from contracting with any Federal, State, or Local agency,
- B2.0** Items for which Bidders were provided herein will be delivered as specified in the bid,
- B3.0** In performing this contract, the Contractor shall comply will any and all applicable Federal, State, and Local laws including but not limited to: Occupation Safety & Health, Equal Employment Opportunity, Immigration and Naturalization, The Americans with Disabilities Act, State Tax and Insurance Law, and the Fair Housing Act.,
- B4.0** Bidder agrees that this bid shall remain open and valid from date of opening until AT issues a notice of award (NOA). NOA will be provided upon approval of financing by Wells Fargo and HUD. This bid shall constitute an offer, which if accepted by AT and subject to the terms and conditions of such acceptance, shall result in a contract between AT and the undersigned bidder.
- B5.0** He/she has not given, offered to give, nor intends to give at any time hereafter any economic opportunity, future employment, gift, loan, gratuity, special discount, trip, favor, or service to a public servant in connection with this bid,
- B6.0** Bidder, nor the firm, corporation, partnership, or institution represented by the Bidder, or anyone acting for such firm, corporation, partnership, or institution has violated the antitrust laws of the State of Ohio or the Federal Antitrust laws, nor communicated directly or indirectly the bid made to any competitor or any other person engaged in such line of business,
- B7.0** Bidder has not received compensation for participation in the preparation of the specifications for this IFB,
- B8.0 Non-Collusive Affidavit:** The undersigned party submitting this bid hereby certifies that such bid is genuine and not collusive and 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 of affiant or of any other Bidder, to fix overhead profit or cost element of said bid price, or that of any other Bidder or to secure any advantage against AT or any person interested in the proposed contract and that all statements in said bid are true,
- B9.0** He/she has full authority to bind Bidder and that no member of Proposer's organization is disbarred, suspend or otherwise prohibited from contracting with any Federal, State, or Local agency, and the individual or business entity named in this bid is eligible to receive the specified payment and acknowledges that this contract may be terminated and payment withheld if this certification is inaccurate,
- B10.0 Lobbying Prohibition:** The Contractor agrees to comply with Section 1352 of Title 31, United States Code which prohibits the use of federally appropriated funds to pay 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 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 any cooperative agreement or the modification of any federal contract, grant, loan, or cooperative agreement.

Signed: _____

Print Name: _____

Print Company Name: _____

Date: _____

Seal (if Corporation)

Appendix C

Section 3

This Low-income Resident Hiring Plan pertaining to the above noted contract is hereby formulated to meet the standards to "ensure that employment and other economic opportunities generated by certain HUD financial assistance shall, to the greatest extent feasible, . . . be directed to low- and very-low-income persons, particularly those who are recipients of government assistance for housing . . ."

1.1 We hereby agree to satisfy the requirements of SMHA’s Low-income Hiring Plan by one or both of the following methods:

1.1.1 **LOW-INCOME RESIDENT HIRING GOALS.** As a result of receiving award of this contract, our firm will need to hire additional employees and we hereby commit to the following number of new hires:

(1)	(2)	(3)	(4)
Classification	Total Number of Current Permanent Employees	Total Number of New Hires that will result from award of this contract	Goal: Total Number of Low-income New Hires that the contractor anticipates will result from award of this contract
Trainees			
Apprentices			
Journeypersons			
Laborers			
Supervisory			
Superintendent			
Professional			
Clerical			
Other:			

AND/OR

1.1.2 **INTERVIEWING AND POTENTIAL HIRING OF AGENCY RESIDENTS.** Our firm hereby agrees to, as a part of our new hire process for any open positions at any time during

the period of time this contract is in effect, if our firm hires any new employees (for any position), we will:

- 1.1.2.1 Review SMHA's listing of resident(s) who have registered, thereby declaring his/her desire to interview and accept a job;
- 1.1.2.2 In the same manner that we do with other applicants, conduct an interview with such resident(s) who have claimed experience within a certain skill set or field and have expressed a desire to interview; and
- 1.1.2.3 If, as a result of the interview and any applicable testing or checking that our firm conducts for all persons interviewing, the resident(s) qualifies for the position and passes all such testing (i.e., skills test; drug tests; credit checks; background check; etc.), we hereby agree to offer the position to the SMHA resident.
- 1.1.2.4 Our firm hereby agrees that all SMHA resident(s) will, during the interview process, be treated equal to and in the same manner as, any non-resident person who interviews with our firm.
 - 1.1.2.4.1 **NOTE:** Our firm shall have no responsibility to hire any resident who does not, as a result of the aforementioned testing and checks, qualify for the position, though the contractor will, as detailed following, be required to report to SMHA the results of such testing and checks, and fully inform SMHA as to why the resident(s) were not hired.
- 1.1.2.5 Further, we hereby agree to inform SMHA in writing of the following within 5 days after a new employee has been hired, including the following information:
 - 1.1.2.5.1 The position title;
 - 1.1.2.5.2 The name of the person hired;
 - 1.1.2.5.3 The date SMHA listing of resident(s) desiring interviews were reviewed by the contractor;
 - 1.1.2.5.4 The name(s) of SMHA resident(s) that the contractor contacted for an interview and the date, time, and method that such contact took place;
 - 1.1.2.5.5 The results of the contact (specifically, did or did not the interview take place; if so, when—if not, why);
 - 1.1.2.5.6 Pertaining to any SMHA resident(s) who were not hired, the results of any tests and checking that the contractor completed (especially any such results that prevented the resident(s) from being offered the position).

The undersigned hereby certifies that the above noted firm will abide by the terms and conditions of this Low-income Resident Hiring Plan as detailed herein.

COMPLETED BY (Contractor):

_____	_____	_____	_____
Signature	Date	Printed Name	Title

Appendix D

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Appendix E

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Appendix F

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Appendix G

List of Past Performance/Experience/Client Information

LIST OF PAST PERFORMANCE/EXPERIENCE/CLIENT INFORMATION

G1.0 Instructions: The Bidders shall submit three (3) former or current clients, preferably other than AT, for whom the Bidder has performed similar or like services to those being proposed herein

G2.0 List of Past Performance/Experience/Client Information

G2.1 Client #1

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Brief Description of Similar Work Performed: _____

G2.2 Client #2

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Brief Description of Similar Work Performed: _____

G2.3 Client #3

Company Name: _____

Address: _____

Appendix H

List of Sub-Contractors/Joint Venture

LIST OF SUB-CONTRACTORS/JOINT VENTURE

H1.0 Subcontractors

H1.1 Will this project have sub-contractors? (Check One) _____ Yes _____ No

H1.1.1 If "Yes", proceed to K1.2. If "No", proceed to K2.0.

H1.2 **Instructions:** Please list all sub-contractors (including contact information) that will be working on any projects resulting from this contract. Each subcontractor should provide: Contractor Profile Form. Attach additional pages if needed.

H1.2.1 List of Subcontractors

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Documentation Attached: _____ Yes _____ No

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Documentation Attached: _____ Yes _____ No

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Documentation Attached: _____ Yes _____ No

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Documentation Attached: _____ Yes _____ No

H2.0 Joint Venture

H2.1 Will this project be a joint venture? (Check One) _____ **Yes** _____ **No**

H2.1.1 If “Yes”, proceed to K2.2. If “No”, no additional information is needed for this tab.

H2.2 Instructions: Please list all companies involved in the joint venture (including contact information). Each company should provide: Vendor Registration Forms & W-9, Contractor Profile Form, and Section 3 Paperwork. Attach additional pages if needed.

H2.2.1 List of Joint Venture Companies

Company Name: _____

Address: _____

Email: _____

Phone Number: _____

Contact Person: _____

Documentation Attached:

Note: Usage of a sub-contractor will be contingent upon AT's prior written approval.

Appendix I

Contractor Profile Form

CONTRACTOR PROFILE FORM

11.0 Instructions: Please complete the below for in its entirety. If additional space is needed, please attach a separate sheet.

Project Name: _____ Project No. _____

Contractor/Business Name: _____

Business Address: _____

Telephone: (____) ____-____ Fax: (____) ____-____

Federal Tax ID #: _____ State Tax ID #: _____

Our contract is with _____ in the amount of \$ _____

for _____
(identify specific work to be performed)

Will any work be subcontracted out? Yes _____ No _____

If yes, to whom? _____

Person(s) authorized to sign (certify) Payroll reports: 1) _____
2) _____

Identify work classification(s), base wage payment and total wage for each individual performing work on the project site. Attach additional sheets if necessary.

Work Classification from wage decision (include group number, if applicable)	Base Rate of Pay	Fringe	Total Wage (including Fringe)

The fringe benefit payment will be (check A, B or C below):

(A) _____ paid to a Union benefit plan (or plans) in the amounts indicated below:

Complete chart below or attach schedule of fringe benefits.

Benefit	Amount
Vacation and Holiday	
Union Dues	
Health and Welfare Benefits	
Pension	
Annuity	
Other (Identify)	

Benefit funds are deposited into accounts maintained by: _____

Address: _____

Telephone: (____) ____-____ Acct. #: (____) ____-____

(B) _____ paid directly (with the pay check) to each worker in the amount of \$_____

(C) _____ paid to an unfunded benefit plan (or plans) in the amounts indicated below:
*****If requested, copies of benefit plans to be submitted for review/approval.*****

Benefit	Amount
Pension	
Medical	
Dental	
Other (Identify)	

Benefit funds are deposited into accounts maintained by: _____

Address: _____

Telephone: (____) ____-____ Acct. #: _____

Is this a sole proprietorship or partnership business? Yes _____ No _____

Caucasian Owned – WBE _____ MBE _____

Owner/Principal Officer Name (Please Print)

Signature

Date

**SECTION 00 3100
INVESTIGATIONS AND REPORTS**

PART 1 - GENERAL

1.1 EXISTING CONDITIONS

- A. The documents listed in this Section are made available to bidders for information. They are not Contract Documents.
 - 1. The reports provided identify concealed conditions.
 - 2. The reports do not reveal all conditions that exist on the site.
 - 3. The Contractor may, at its own expense, engage and pay for additional subsurface investigations. Coordination with the Owner is required.

1.2 REPORTS

- A. Roof Core Cut Analyses
 - 1. RoofTEC
Roof Evaluation Testing, Report of Findings
Alliance Senior Towers, (17 pages) dated March 7, 2022
- B. Asbestos Hazard Evaluation Survey
 - 1. RoofTEC
Asbestos Sampling, Report of Findings
Alliance Senior Towers, (28 pages) dated March 11, 2022

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION

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ROOFTEC

36403 Vine Street, Willoughby, OH 44094
Ph: 440.269.2066 • fax: 440.269.2067 • rooftec@rooftecinc.com

Roof Evaluation Testing Report of Findings

Alliance Senior Towers

350 S Arch Avenue
Alliance, Ohio 44601



Date:

March 7, 2022

Submitted to:

Tiffany A.L. Gravlee
TC Architects

Submitted By:

Scott Snyder, Principal
RoofTEC, Inc.

Roof Evaluation Testing Report of Findings

RoofTEC met onsite with 2 representatives from the Stark Metropolitan Housing Authority (SMHA) at the Alliance towers on Thursday March 3, 2022, to perform the roof evaluation testing. Our testing included roof core extractions for asbestos testing, asbestos Screening of up to 12 samples, Lightweight concrete pull tests, and measure the existing roof slopes. We have included our test findings, photographs, and a drawing sketch of the building with test locations (asbestos results will be submitted once received from the laboratory).

Existing Construction Core Extractions

RoofTEC reviewed the drawings you provided while onsite to understand the roofing construction. We performed 4 large core extraction openings to perform pull testing on the existing lightweight concrete. The following are the findings from each area (listed from the surface down to the decking).

Opening #1

Grey granulated modified bitumen ply hot/torch applied
Smooth modified bitumen base sheet attached with a 1/4" diameter anchor
1.5" layer of polyisocyanurate insulation (attached with base sheet anchor)
Structural concrete

Opening #2

Grey granulated modified bitumen ply hot/torch applied
Smooth modified bitumen base sheet attached with a 1/4" diameter anchor(nail)
1.5" layer of polyisocyanurate insulation (attached with base sheet anchor)
Structural concrete

Opening #3

Grey granulated modified bitumen ply hot/torch applied
Smooth modified bitumen base sheet attached with a 1/4" diameter anchor
1.5" layer of polyisocyanurate insulation (attached with base sheet anchor)
Structural concrete

Opening #4

Grey granulated modified bitumen flashing ply hot/torch applied
Smooth modified bitumen flashing interply hot/torch applied
Grey granulated modified bitumen ply hot/torch applied
Smooth modified bitumen interply hot/torch applied
1" layer of polyisocyanurate insulation (top layer of composite board)
3/4" Perlite insulation (bottom layer of composite board) hot applied
Structural concrete

Concrete Fastener Pull Test Findings

We did not find lightweight concrete in any of the openings. We attempted to install the three (3) different lightweight concrete fasteners. An auger fastener, stamp-in fastener, and a coated steel fastener and none were able to penetrate the concrete. We used a hammer drill to predrill a hole to test a structural spike. This is the same fastener currently installed at the openings. RoofTEC used a DMD Force Measurement Systems fastener tester that was calibrated June 1, of 2021 to be accurate within .25%. The certificate number is 4303. The holes for the anchor spikes had to be predrilled. We predrilled approximately between 1" and 1.5" into the concrete decking. The anchor was installed with a hammer and removed by the pull tester. The mechanical penthouse also did not have lightweight; therefore, we did not perform pull out test on it. The following are the successful peak test results for the concrete anchors:

Test ID	Pull out value lbs./ft	Type of Anchor	Location
Test 1	800.4 lbf	1/4" concrete spike	Main Roof
Test 2	639.6 lbf	1/4" concrete spike	Main Roof
Test 3	680.0 lbf	1/4" concrete spike	Main Roof
Test 4	919.7 lbf	1/4" concrete spike	Main Roof

Please note: The auger fastener and stamp in fastener were not strong enough to penetration the concrete, the coated steel fastener was designed to be self-penetrating into the concrete and did not penetrate the concrete.

Current Roof Slope Measurements

RoofTEC used an electric level with inches per foot slope. The level was calibrated onsite with 2 additional levels. The following are the slope findings from the multiple different locations on the roof.

Test ID	Slope Measurement	Location
Spot 1	1/4" slope to drain line	Main Roof
Spot 2	1/8" slope to drain line	Main Roof
Spot 3	1/8" slope to drain line	Main Roof
Spot 4	1/4" slope to drain line	Main Roof
Spot 5	1/8" slope to drain line	Main Roof
Spot 6	1/8" slope to drain line	Main Roof
Spot 7	1/8" slope to drain line	Main Roof
Spot 8	1/4" slope to drain line	Main Roof
Spot 9	1/8" slope to drain line	Main Roof
Spot 10	1/8" slope to drain line	Main Roof
Spot 11	1/4" slope to drain line	Main Roof
Spot 12	1/8" slope to drain line	Main Roof
Spot 13	1/8" slope to drain line	Main Roof
Spot 14	1/8" slope to drain line	Main Roof
Spot 15	1/8" slope to drain line	Main Roof

Test ID	Slope Measurement	Location
Spot 16	1/8" slope to drain line	Main Roof
Spot 17	0" slope to drain line	Main Roof
Spot 18	1/8" slope to drain line	Main Roof
Spot 19	1/4" slope to drain line	Main Roof
Spot 20	1/8" slope to drain line	Mechanical Penthouse

Consulting Commentary

A representative of SMHA informed us the roof was installed in the year 2001. The roof has had numerous recent repairs on the north end. There was also a report of the HVAC unit door blowing across the roof and causing damage. I observed a cut in the roof and repaired the hole to prevent/stop any further water infiltration until the roof is replaced. There are numerous ridges in the roof which appear to be the insulation boards telegraphing through the membrane. There are many wrinkles which indicates the cap ply has lost adhesion to the base sheet. These are both indications that the roof has reached the end of its useful life cycle. There are also a few areas of ponding water. Understandably the areas that hold water all measured as 0" slope to the drain line. The slope in the roof appears to be from original casting of the concrete. There are 3 drains on the main roof. The mechanical penthouse slopes to a scupper and downspout which drains onto the main roof area.

The results from the openings for pull tests indicate that no lightweight concrete was found. The initial hope was to reuse the lightweight if it was in fact installed. I recommend the roof be removed down to the decking and a new system designed integrating more slope to promote drainage. The current membrane/insulation spikes will need to be ground off flush to the concrete decking prior to installation of the new roof. Polyisocyanurate insulation is hard to acquire due to industry shortages and significant manufacturing delays. Lightweight insulating concrete is an option, or tapered extruded polystyrene is an option. The new system r value will be more difficult to achieve with these two options, but they are more readily available. Another consideration should be to create 8'X8' insulation sumps around the drains to assist in removing the ponding water around the drains.

Lastly, we observed a heat stack and other mechanical lines penetrating the base of the mechanical penthouse. The heat stack is deteriorated and should be considered for replacement. The substrate that the lines and stack penetrate is plywood. This should be redesigned to properly separate the lines and allow for the heat stack to be properly flashed.

Photographic Documentation of Findings



Opening #A1 – spike anchor installed with plate



New spike installed for pull test at A1



Pull test #1 being performed at A1



Pull test #1 results at A1



Opening #A2 – hole being predrilled for pull test #2



Pull test #2 results at opening #A2



Pull test #3 results at opening # A2



Measuring 1" insulation at opening # A3



Pull test #4 results at opening # A3



Cap ply not adhered/bonded to the base sheet



Opening # A4 on the mechanical penthouse



Measuring roof system thickness on the mechanical penthouse



Slope measurement reading 1/8"



Slope measurement reading 1/8"



Slope measurement reading 1/4"



Ponding water near the parapet wall



Ponding water on the east side of the main roof



Ponding water on the north end of the main roof



Ponding water on the south end of the main roof



Wrinkles and ridges in the cap ply



Slice in the membrane (appears to be from HVAC unit door)



Completed repair of slice in the membrane



Deteriorated heat stack penetrating wood structure at base of mechanical penthouse



Multiple lines penetrating wood structure at base of mechanical penthouse

Sector Identifications



- LEGEND**
- Plumbing Stack
 - ⊕ System Vent
 - ⊙ J - Vent
 - ◆ Drain (Existing)
 - ▢ HVAC on Curb
 - ▣ Roof Hatch

ROOFTEC

36403 Vine Street, Willoughby, OH 44094
 Ph: 440.269.2066 Fax: 440.269.2067 rooftec@rooftecinc.com

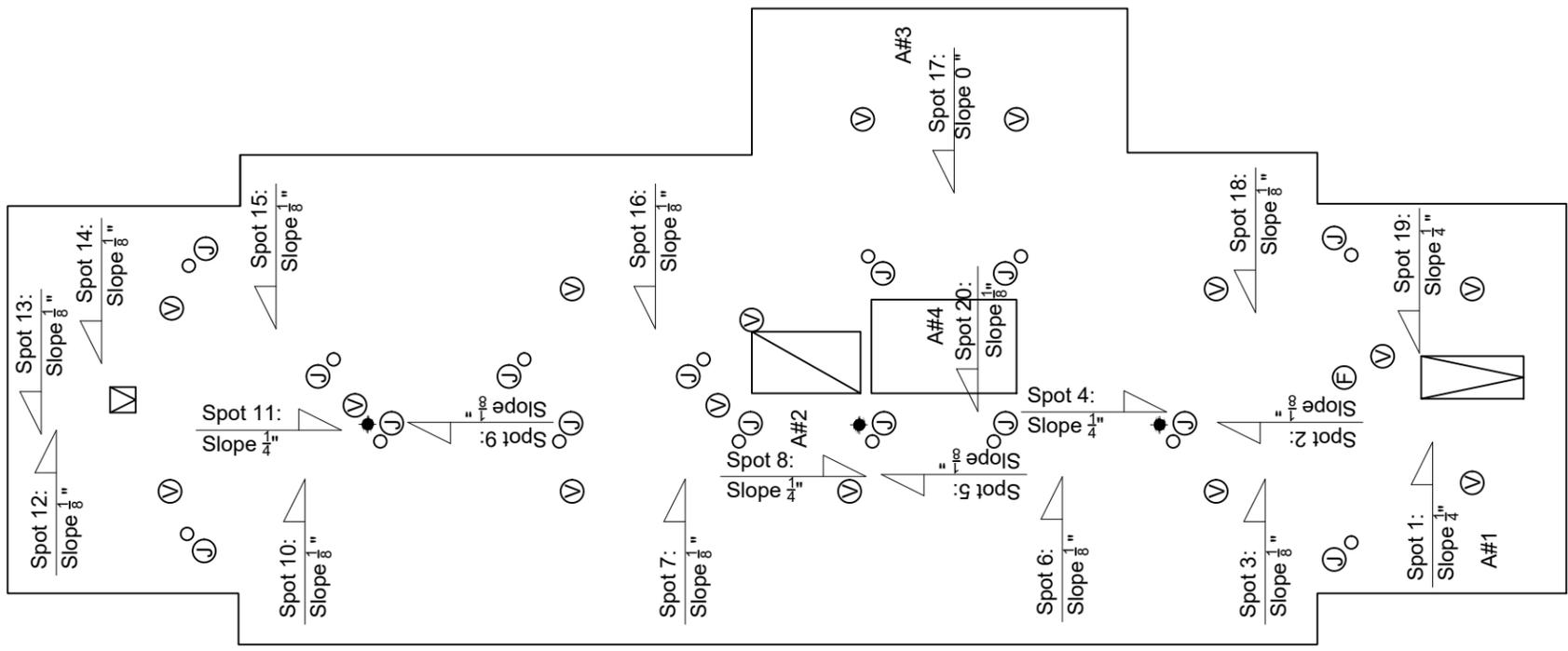
Project
Stark Metro Housing Authority
 Alliance Senior Towers
 350 S Arch Avenue
 Alliance, Ohio 44601

Customer
 Tiffany A.L. Gravlee
 TC Architects
 430 Grant Street
 Akron, Ohio 44311

Dwg. By KF Checked By SS

Date 3 / 2022 Scale N.T.S

Job # 22009.01



ROOFTEC

36403 Vine Street, Willoughby, OH 44094
Ph: 440.269.2066 • fax: 440.269.2067 • rooftec@rooftecinc.com

Asbestos Sampling Report of Findings

Alliance Senior Towers

350 S Arch Avenue
Alliance, Ohio 44601



Date:

March 11, 2022

Submitted to:

Tiffany A.L. Gravlee
TC Architects

Submitted By:

Kristen Farrell, B.S., AHES
RoofTEC, Inc.

METHODOLOGY

Sampling was conducted in accordance with the USEPA guidelines to meet the Asbestos Hazard Emergency Response Act (AHERA) and National Emission Standards for Hazardous Air Pollutants (NESHAPS) regulations, with additional notations for compliance with Occupational Safety and Health Administration (OSHA) regulations.

Suspected ACM samples were collected based on age, physical appearance, location, system located, and other factors. Samples of homogeneous material were collected and analyzed by a NVLAP accredited Laboratory, EA Group (Environmental Analysis and Management). Suspected ACM samples were placed in zip-lock polyethylene-low density bags and related information was marked on the sample bag. All samples were submitted to EA Group for analysis along with a chain-of-custody form.

The suspected ACM samples were given to EA Group for verification of ACM percentages. Classification of any positively identified ACM. Material Sampled in the abatement included ply roofing and flashing. Samples reported with a visually estimated of at least 10% asbestos, point counting is not required to satisfy NESHAP requirements.

Attachment No. 1 contains asbestos bulk sample log summaries the analysis of the bulk sample obtained during the abatement. Attachment No. 2 contains copies of the EA Group bulk sample laboratory reports from the samples collected out in the field. Lastly, attachment No. 3 contains certifications of completed training from Training Services International (TSI) for Asbestos Building Inspector Initial and Asbestos Management Planner Initial.

FINDINGS

Listed below are the following suspected asbestos samples and location found by EA Group to be containing asbestos material.

ABESTOS-CONTAINING ASPHALT ON DECK

Approximately 200 sq. ft. of Asphalt Deck on the Alliance Senior Towers-Penthouse Roof, EAG ID. 2203-00036-09A, were reported with 20% Chrysotile Asbestos containing.

ABESTOS-CONTAINING FIELD AND FLASHING ROOF

Approximately 200 sq. ft. of Field and Flashing roof system on the Alliance Senior Towers-Penthouse Roof, EAG ID. 2203-00036-08A and 2203-00036-08B, were reported with 2% and 15% Chrysotile Asbestos containing material. Point counting can be requested for EAG ID. 2203-00036-08A to verify this analytical result.

ABESTOS-CONTAINING ASPHALT FLASHING

Asphalt behind flashing on the Alliance Senior Towers-Main Roof, EAG ID. 2203-00036-07A, were reported with 5% Chrysotile Asbestos containing material. No point counting was conducted by the EA Group.

RECOMMENDATIONS

NESHAP Regulations require that all RACM (Regulated Asbestos Containing Materials) be removed in a building being renovated before any activity begins that would break up, dislodge, or similarly disturb the material or preclude access to the material for subsequent removal. If additional suspect materials are uncovered during the roof replacement project, additional asbestos testing will need to be performed prior to disruption of the material in its current state.

Stark Metro Housing Authority
Alliance Senior Towers
March 11, 2022

ROOFTEC

ATTACHMENT NO. 1
BULK SAMPLES LOG



Bulk Sample Log						
Suspect Material HA#	HA Description	Sample Location	Friable/Non-Friable (F/NF)	Material Type Surfacing, TSI, Misc	Asbestos Containing	% Asbestos
2203-0036-01A	Coping Sealant	West - Main Roof	NF	Misc	No	----
2203-0036-02A	Skirt Flashing Sealant	Northwest - Main Roof	NF	Misc	No	----
2203-0036-03A	J-Vent Coating	North End - Main Roof	NF	Misc	No	----
2203-0036-04A	Field Membrane (Construction Core)	East A#3 - Main Roof	NF	Misc	No	----
2203-0036-04B	Field Membrane (Construction Core)	East A#3 - Main Roof	NF	Misc	No	----
2203-0036-05A	Asphalt on Deck (Core)	East A#3 - Main Roof	NF	Misc	No	----
2203-0036-06A	Flashing Membrane	Southwest - Main Roof	NF	Misc	No	----
2203-0036-06B	Flashing Membrane	Southwest - Main Roof	NF	Misc	No	----
2203-0036-07A	Asphalt behind Flashing	Southwest - Main Roof	NF	Misc	Yes	5
2203-0036-08A	Field and Flashing Membrane (Core)	East A#4 - Penthouse	NF	Misc	Yes	2

Bulk Sample Log

Suspect Material HA#	HA Description	Sample Location	Friable/Non-Friable (F/NF)	Material Type Surfacing, TSI, Misc.	Asbestos Containing	% Asbestos
2203-0036-08B	Field and Flashing Membrane (Core)	East A#4 – Penthouse	NF	Misc	Yes	15
2203-0036-09A	Asphalt on Deck (Core)	East A#4 – Penthouse	NF	Misc	Yes	20
2203-0036-10A	Sealant on Coping	West – Penthouse	NF	Misc	No	----
2203-0036-10B	Sealant on Coping	West – Penthouse	NF	Misc	No	----
2203-0036-11A	Fire Pipe Coating	South – Main Roof	NF	Misc	No	----
2203-0036-12A	Counterflashing Sealant	South – Penthouse	NF	Misc	No	----

Stark Metro Housing Authority
Alliance Senior Towers
March 11, 2022

ROOFTEC

ATTACHMENT NO. 2

Laboratory reports



EA GROUP

Environmental Analysis
and Management

Roof T.E.C., Inc.
36403 Vine Street
Willoughby, OH 44094-6312
Kristen Farrell

Client Project: Alliance Senior Tower
EA Group Workorder Number: 220300036
Received on March 2, 2022

The following analytical report contains results as requested for samples submitted to EA Group. The results included in this report have been reviewed for compliance with the analytical methods indicated in this report. All data has been found to be compliant with accepted laboratory protocol, except as noted in the QC narrative. Industrial hygiene reports, air and/or surface concentrations results are based upon sampling information provided by the client. Analyst initials of REF indicate analysis performed at a subcontract facility.

If you have questions, comments or require further assistance regarding this report, please contact your client services representative or one of the individuals listed below.

Data or reporting:

Debbie Lauer - Lab Manager
dlauer@eagroupohio.com

Mike Herbert - General Manager
mherbert@eagroupohio.com

Sample tracking, supplies:

Sample Receiving
sreceiving@eagroupohio.com

Invoice Related:

Bonnie Renbarger - Office Manager
brenbarger@eagroupohio.com

Reproduction of this report is prohibited except in its entirety . Unless noted, soil, sludge and sediment results are reported on dry weight basis. The "Sample Reporting Limit" is based on the method used for analysis and does not refer to any regulatory limit. These results relate only to the items tested.



EA GROUP

Environmental Analysis
and Management

Laboratory Analytical Report

Roof T.E.C., Inc.

36403 Vine Street

Willoughby, OH 44094-6312

Attention:
Kristen Farrell

Project Identification

Alliance Senior Tower

Purchase Order:

K22009.01

EA Group

Order Number

2203-00036

Carl R. Eggebraaten
Microscopist

Deborah Lauer
Laboratory Manager

March 7, 2022



Project Summary

The following analytical report contains the results as requested for samples submitted to EA Group. The results included in this report have been reviewed for compliance with the analytical methods indicated in this report. All data have been found to be compliant with accepted laboratory protocol. Exceptions, if any, are noted below.

Sample Summary

Sample Receive Date: 3/ 2/2022

<u>EAG</u>	<u>Client</u>	<u>EAG</u>	<u>Client</u>
<u>Sample Identification</u>	<u>Sample Identification</u>	<u>Sample Identification</u>	<u>Sample Identification</u>
220300036-01A	#1 Coping Seal	220300036-02A	#2 Skirt Flash
220300036-03A	#3 J Vent Coat	220300036-04A	#4 Field Membrane
220300036-04B	#4 Field Membrane	220300036-05A	#5 Asphalt Deck
220300036-06A	#6 Flash Membrane	220300036-06B	#6 Flash Membrane
220300036-07A	#7 Asphalt Flash	220300036-08A	#8 Field & Flash
220300036-08B	#8 Field & Flash	220300036-09A	#9 Asphalt Deck
220300036-10A	#10 Sealant	220300036-10B	#10 Sealant
220300036-11A	#11 Coating Fire	220300036-12A	#12 Sealant

Quality Control Narrative

Reproduction of this report is prohibited except in its entirety. Unless noted, soil, sludge, and sediment results are reported on dry weight basis. The "Sample Reporting Limit" is based on the method used for analysis and does not refer to any regulatory limit.

EAG ID: 2203-00036-01A	Client ID: #1 Coping Seal	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		ND	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		ND	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		34	
% Other Non-Asbestos Mat'ls		66	
Analysis Comments		NA	
Sample Physical Description:	White and brown caulks		

EAG ID: 2203-00036-02A	Client ID: #2 Skirt Flash	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		ND	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		ND	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		69	
% Other Non-Asbestos Mat'ls		31	
Analysis Comments		NA	
Sample Physical Description:	Black and clear brown caulks		

EAG ID: 2203-00036-03A	Client ID: #3 J Vent Coat	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		ND	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		ND	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		71	
% Other Non-Asbestos Mat'ls		29	
Analysis Comments		NA	
Sample Physical Description:	Silver on black material		

EAG ID: 2203-00036-04A	Client ID: #4 Field Membrane	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	Trace	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	60	
% Other Non-Asbestos Mat'ls	40	
Analysis Comments	NA	

Sample Physical Description: Black bituminous material w/white pebble surfacing

EAG ID: 2203-00036-04B	Client ID: #4 Field Membrane	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	15	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	44	
% Other Non-Asbestos Mat'ls	41	
Analysis Comments	NA	

Sample Physical Description: Thin black bituminous fibrous material

EAG ID: 2203-00036-05A	Client ID: #5 Asphalt Deck	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	96	
% Other Non-Asbestos Mat'ls	4	
Analysis Comments	NA	

Sample Physical Description: Black bituminous material w/brown coating

EAG ID: 2203-00036-06A	Client ID: #6 Flash Membrn	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	54	
% Other Non-Asbestos Mat'ls	46	
Analysis Comments	NA	
Sample Physical Description:	Black bituminous material w/white pebble surfacing	

EAG ID: 2203-00036-06B	Client ID: #6 Flash Membrn	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	Trace	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	49	
% Other Non-Asbestos Mat'ls	51	
Analysis Comments	NA	
Sample Physical Description:	Black bituminous material w/lit. brown pebble surfacing	

EAG ID: 2203-00036-07A	Client ID: #7 Asphalt Flash	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	5	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	83	
% Other Non-Asbestos Mat'ls	12	
Analysis Comments	+	see note on last page
Sample Physical Description:	Black bituminous material	

EAG ID: 2203-00036-08A	Client ID: #8 Field & Flash	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		2	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		Trace	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		54	
% Other Non-Asbestos Mat'ls		44	
Analysis Comments		**	
Sample Physical Description:	Black bituminous material w/lt. gray pebble surfacing		

EAG ID: 2203-00036-08B	Client ID: #8 Field & Flash	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		15	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		1	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		73	
% Other Non-Asbestos Mat'ls		11	
Analysis Comments		NA	
Sample Physical Description:	Black bituminous material w/yellow foam		

EAG ID: 2203-00036-09A	Client ID: #9 Asphalt Deck	Matrix: Bulk	
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022	Analyst: CRE
<u>Parameter</u>		<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis			
% Chrysotile Asbestos		20	
% Amosite Asbestos		ND	
% Crocidolite Asbestos		ND	
% Other Asbestos Fibers		ND	
% Fibrous Glass		ND	
% Other Non-Asbestos Fibers		ND	
% Gravimetrically Reduced		47	
% Other Non-Asbestos Mat'ls		33	
Analysis Comments		NA	
Sample Physical Description:	Black bituminous material		

EAG ID: 2203-00036-10A	Client ID: #10 Sealant	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	72	
% Other Non-Asbestos Mat'ls	28	
Analysis Comments	NA	
Sample Physical Description:	Black bituminous material	

EAG ID: 2203-00036-10B	Client ID: #10 Sealant	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	75	
% Other Non-Asbestos Mat'ls	25	
Analysis Comments	NA	
Sample Physical Description:	Black caulk	

EAG ID: 2203-00036-11A	Client ID: #11 Coating Fire	Matrix: Bulk
Date Sampled: 03/02/2022	Date Received: 03/02/2022	Date Analyzed: 03/07/2022
		Analyst: CRE

<u>Parameter</u>	<u>Result</u>	<u>Description</u>
Bulk Asbestos Analysis		
% Chrysotile Asbestos	ND	
% Amosite Asbestos	ND	
% Crocidolite Asbestos	ND	
% Other Asbestos Fibers	ND	
% Fibrous Glass	ND	
% Other Non-Asbestos Fibers	ND	
% Gravimetrically Reduced	80	
% Other Non-Asbestos Mat'ls	20	
Analysis Comments	NA	
Sample Physical Description:	Gray on red material	

EAG ID: 2203-00036-12A

Client ID: #12 Sealant

Matrix: Bulk

Date Sampled: 03/02/2022

Date Received: 03/02/2022

Date Analyzed: 03/07/2022

Analyst: CRE

Parameter

Result

Description

Bulk Asbestos Analysis

% Chrysotile Asbestos

ND

% Amosite Asbestos

ND

% Crocidolite Asbestos

ND

% Other Asbestos Fibers

ND

% Fibrous Glass

ND

% Other Non-Asbestos Fibers

ND

% Gravimetrically Reduced

73

% Other Non-Asbestos Mat'ls

27

Analysis Comments

NA

Sample Physical Description: Black caulk w/gray coating



Workorder: 220300036

These bulk samples were analyzed as received for percentage composition of Asbestos and Non-Asbestos materials by Method(s) EPA-600/M4-82-020, December 1982 and/or EPA/600/R93/116 July 1993, which have Detection Limits of less than 1% Asbestos.

Asbestos Containing Materials (ACM) and Presumed Asbestos Containing Materials (PACM) are regulated by several different governmental regulatory agencies.

EPA NESHAP regulations cover certain buildings that are to be renovated or demolished. NESHAP regulations require that when a sample (or layer of a multi-layered sample) is analyzed and found to contain asbestos at a concentration of less than 10% by a method other than point counting by Polarized Light Microscopy (PLM), the owner/operator has the option of:

- 1) Assuming the amount to be greater than 1% and treating the material as regulated ACM.
- OR
- 2) Requesting verification of the amount by point counting.

Building owners/operators covered by NESHAP should review the following for the full and specific regulations:

- 1) Federal Register, Vol. 55, No. 224, Tuesday, November 20, 1990
- 2) Clarification of NESHAP requirement to perform point counting, May 8, 1991
- 3) Federal Register, Vol. 59, No. 3, Wednesday, January 5, 1994
- 4) Federal Register, Vol. 59, No. 146, Monday, August 1, 1994
- 5) Federal Register, Vol. 60, No. 243, Tuesday, December 19, 1995

Building owners/operators and employers covered by OSHA regulations also have specific requirements regarding ACM and PACM. Those who may be covered by these regulations should review 29 CFR 1910.1001 and 29 CFR 1926.1101 for specific requirements.

FLOOR TILES: PLM should only be considered a screening method for floor tile analysis. Any floor tile with a result of one percent or less asbestos by PLM should be assumed positive for asbestos until the sample is re-analyzed by Analytical Electron Microscopy.

Other difficult matrices (such as bituminous, organically bound, and cementitious materials) may obscure very small asbestos fibers. Some samples may also contain asbestos fibers with diameters below the limit of resolution of the optical microscopes used in typical PLM analysis. Therefore, negative results by PLM on these materials should be confirmed by Analytical Electron Microscopy.

EA Group has a sample retention policy of at least 30 days. After that time, the samples will be disposed of unless the client has requested that they be returned. The client will be charged a shipping and handling fee associated with returned samples only.

Key to analysis comments (if noted on samples):

- * Asbestos content in this sample has been verified by the Chalkley point counting procedure.
- ** The client has the option of requesting verification of this analytical result by point counting as specified by the NESHAP standards.
- *** Insufficient sample amount for quantitation and/or performing Quality Control functions.
- **** Due to the nature of the sample (dust, debris, or vacuum), percentages for the constituents could not be assigned.
- + After gravimetric reduction, the residue has been visually estimated as at least 10% asbestos. Therefore, point counting is not required to satisfy NESHAP requirements.
- ++ Contains fibers that may be an asbestos mineral but could not be positively identified by PLM. Analysis by Transmission Electron Microscopy (TEM) is recommended.
- +++ See additional comment on conclusions page.

ND	None Detected
Trace	Observed but less than 1%
NH	Non-Homogeneous sample, the result reflects the average.
Und. non-asb	Undetermined non-asbestos fibers

This report applies only to sample(s) analyzed and may not be used by the client to claim product certification, approval, or endorsement by NVLAP or any agency of the U.S. Government.



CHAIN OF CUSTODY

BULK ASBESTOS ONLY
PLEASE DO NOT SEPARATE FORMS

EAG WORK ORDER

PAGE 1

7118 INDUSTRIAL PARK BLVD. MENTOR, OHIO 44060-5314
(440) 951-3514 FAX (440) 951-3774 (800) 875-3514
website: www.eagroupohio.com customer.service@eagroupohio.com

Company Name RoofTEC Alliance Senior Center		
Report Address 36403 Vine St		
City Willoughby	State Ohio	Zip 44094
Phone 440-269-2066	Fax 440-269-2067	
Report Attention Kristen Farnell		
Email Address RoofTEC@RoofTECInc.com		
Project Name Alliance Senior Tower		
P.O. # Quote # K22009.01		

TURNAROUND (✓)	
RUSH	<input checked="" type="checkbox"/>
NORMAL	<input checked="" type="checkbox"/>

LABORATORY PROCEDURE	
ASBESTOS COMPOSITE	ASBESTOS LAYERED
FULL ANALYSIS: ASBESTOS / NON-ASBESTOS	
POINT COUNT APPROVED	

SAMPLE IDENTIFICATION	MATRIX	COLLECTION DATE	ASBESTOS COMPOSITE	ASBESTOS LAYERED	FULL ANALYSIS: ASBESTOS / NON-ASBESTOS	POINT COUNT APPROVED
H #1 Coping Sealant west main roof		3/2/22			X	
H #2 Skirt flash seal north west main roof		↓			X	
H #3 J Vent coating north end main roof					X	
H #4 field Membrane East main A #3					X	
H #5 Asphalt on Deck East main A #3					X	
H #6 Flash Membrane south west main roof					X	
H #7 Asphalt behind flash south west main roof					X	
H #8 field and flash East side Penthouse A #4					X	
H #9 Asphalt on deck East side Penthouse #4					X	
H #10 Sealant on Coping Penthouse West					X	

Method of Shipment: EAG Client Fed Ex UPS Other _____

Explanation of Laboratory Procedures:

EA Group employs EPA Method 800/R-93/116 in the analysis of bulk materials for asbestos content by polarized light microscopy (PLM).

Composite Analysis – Sample will be composited and a single result will be reported for asbestos content. Point Count is NOT applicable to this analysis.

Layered Analysis – Individual layers will be analyzed separately. The report will not include non-asbestos components.

Full Analysis – Individual layers will be analyzed separately. The report will include asbestos and non-asbestos components.

Point Count – The point count procedure is typically used to quantify asbestos in samples previously quantified by the Visual Estimation Method. A separate charge applies for each sample that is point counted. This method is NOT applicable to Composite Analysis.

Relinquished by (sign) <i>[Signature]</i>	Date/Time 3/2/22 4:40	Received by (sign) <i>[Signature]</i>	Date/Time 3/2 1640
Relinquished by (sign)	Date/Time	Received by (sign)	Date/Time
Relinquished by (sign)	Date/Time	Received by (sign)	Date/Time

WHITE - FILE

YELLOW - INVOICE

PINK - CUSTOMER

Rev 6 2/20



CHAIN OF CUSTODY
BULK ASBESTOS ONLY
PLEASE DO NOT SEPARATE FORMS

EAG WORK ORDER # _____

PAGE 2

7118 INDUSTRIAL PARK BLVD. MENTOR, OHIO 44080-5314
 (440) 951-3514 FAX (440) 951-3774 (800) 873-3514
 website: www.eagroupohio.com customerservice@eagroupohio.com

Company Name ROOFTEC		
Report Address 26403 Vine St		
City Willoughby	State OHIO	Zip 44094
Phone 440-269-2066	Fax 440-269-2067	
Report Attention Kristen Farrell		
Email Address rooftec@rooftecinc.com		
Project Name Alliance Senior Towers		
P.O. # Quote # K22009.01		

TURNAROUND (✓)
RUSH <input checked="" type="checkbox"/>
NORMAL <input checked="" type="checkbox"/>

LABORATORY PROCEDURE	
ASBESTOS COMPOSITE	ASBESTOS LAYERED
FULL ANALYSIS: ASBESTOS / NON-ASBESTOS	
POINT COUNT APPROVED	

SAMPLE IDENTIFICATION	MATRIX	COLLECTION DATE	ASBESTOS COMPOSITE	ASBESTOS LAYERED	FULL ANALYSIS: ASBESTOS / NON-ASBESTOS	POINT COUNT APPROVED
H # 11 Coating paint south fine pipe main roof		3/2/22			X	
H # 12 Sealant on counter flashing Penthouse south		3/2/22			X	

Method of Shipment: EAG Client Fed Ex UPS Other _____

Explanation of Laboratory Procedures:

EA Group employs EPA Method 600/R-93/116 in the analysis of bulk materials for asbestos content by polarized light microscopy (PLM).

Composite Analysis – Sample will be composited and a single result will be reported for asbestos content. Point Count is NOT applicable to this analysis.

Layered Analysis – Individual layers will be analyzed separately. The report will not include non-asbestos components.

Full Analysis – Individual layers will be analyzed separately. The report will include asbestos and non-asbestos components.

Point Count – The point count procedure is typically used to quantify asbestos in samples previously quantified by the Visual Estimation Method. A separate charge applies for each sample that is point counted. This method is NOT applicable to Composite Analysis.

Relinquished by (sign)	Date/Time	Received by (sign)	Date/Time
		<i>[Signature]</i>	3/2 11640
Relinquished by (sign)	Date/Time	Received by (sign)	Date/Time
Relinquished by (sign)	Date/Time	Received by (sign)	Date/Time

Stark Metro Housing Authority
Alliance Senior Towers
March 11, 2022

ROOFTEC

ATTACHMENT NO. 3
Photographic Documentation

Photographic Documentation



Sample# 2203-0036-01A Coping Sealant



Sample# 2203-0036-02A Skirt Flashing Sealant



Sample# 2203-0036-03A J-Vent Coating



Sample# 2203-0036-04A, 2203-0036-04B Field Membrane



Sample# 2203-0036-05A Asphalt on Deck



Sample# 2203-0036-06A, 2203-0036-06B Flashing Membrane



Sample# 2203-0036-07A Asphalt behind Flashing



Sample# 2203-0036-08A, 2203-0036-08B Field and Flashing Membrane



Sample# 2203-0036-09A Asphalt on Deck



Sample# 2203-0036-10A, 2203-0036-10B Sealant on Coping



Sample# 2203-0036-11A Fire Pipe Coating



Sample# 2203-0036-12A Counterflashing Sealant

Stark Metro Housing Authority
Alliance Senior Towers
March 11, 2022

ROOFTEC

ATTACHMENT NO. 4
Certification



Mike DeWine, Governor
Jon Husted, Lt. Governor
Laurie A. Stevenson, Director

10/19/2021

Kristen Farrell
RoofTEC Inc
36403 Vine St.
Willoughby, OH 44094

RE: Evaluation Specialist
Certification Number: ES545798
Expiration Date: 10/14/2022

Dear Kristen Farrell:

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

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

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

Sincerely,

Joshua S. Koch
Manager, Business Operations Support Section
Ohio EPA - Division of Air Pollution Control

State of Ohio Environmental Protection Agency Asbestos Program	
Asbestos Hazard Evaluation Specialist	
Kristen Farrell	
RoofTEC Inc 36403 Vine St. Willoughby OH 44094	Ohio Environmental Protection Agency
Certification Number	Expiration Date
ES545798	10/14/22
	 DOB: 8/22/95 Card not Valid if Altered

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**SECTION 01 1000
SUMMARY**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections, apply to all Specification sections.

1.2 PROJECT IDENTIFICATION

- A. Project Name: Alliance Towers
- B. Project Location: 350 S. Arch Ave., Alliance, Oh 44601
- C. Owner's Name: Stark Metropolitan Housing Authority
- D. Architect's Name: TC Architects.

1.3 CONTRACT DESCRIPTION

- A. Contract Type: A single prime contract based on a Stipulated Price

1.4 PROJECT DESCRIPTION

- A. The Work of the Project an existing 76,000 SF, 7-story high-rise residential building containing (100) 1-Bedroom units, including but not limited to:
 - 1. Licenses, permits, inspections, and fees required by authorities having jurisdiction
 - 2. Temporary facilities and controls necessary for coordination and management of the site and work.
 - 3. Concrete work
 - 4. Miscellaneous metal fabrications
 - 5. Carpentry, cabinetry, and casework
 - 6. Insulation sealants, firestopping and other forms of thermal and moisture protection.
 - 7. Frames, doors, and hardware
 - 8. Drywall
 - 9. Finishes
 - 10. Specialties and accessories
 - 11. Furnishings
 - a. Casework
 - b. Countertops
 - 12. Plumbing
 - 13. HVAC
 - 14. Electrical work
 - 15. Minimal site work
 - 16. Final cleaning.
 - 17. Final closeout procedures.

1.5 CONTRACTOR USE OF SITE AND PREMISES

- A. Construction Operations: Limited to areas coordinated with Owner.
- B. Time Restrictions:
 - 1. Limit conduct of noise-producing work to the hours of 8:00 a.m. and 5:00 p.m.

1.6 WORK SEQUENCE

- A. Coordinate construction schedule and operations with Owner.
- B. Work to be Prioritized
 - 1. Elevator repairs to be completed one elevator at a time. Work to begin with Elevator 1.
 - 2. Removal of the underground storage tank.

1.7 WORK BY OWNER

- A. General: Cooperate fully with Owner so work may be carried out smoothly, without interfering with or delaying work under this Contract or work by Owner. Coordinate the

Work of this Contract with work performed by Owner.

- B. Subsequent Work: Owner will perform the following additional work at site. Completion of that work will depend on successful completion of preparatory Work under this Contract.
 - 1. Installation of refrigerators

1.8 LIQUIDATED DAMAGES

- A. See the invitation to bid for amounts to be applied.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 1000

**SECTION 01 2500
SUBSTITUTION PROCEDURES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions.
- B. Related Requirements:
 - 1. Section 01 6000 "Product Requirements" for requirements for submitting comparable product submittals for products by listed manufacturers.

1.3 DEFINITIONS

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
 - 1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
 - 2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Substitution Request Form: Use facsimile of form provided in Project Manual.
 - 2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.

- j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within 15 days of receipt of request, or seven days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Change Order, Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
 - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage a qualified testing agency to perform compatibility tests recommended by manufacturers.

1.6 PROCEDURES

- A. Coordination: Revise or adjust affected work as necessary to integrate work of the approved substitutions.

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than 15 days prior to time required for preparation and review of related submittals.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - b. Substitution request is fully documented and properly submitted.
 - c. Requested substitution will not adversely affect Contractor's construction schedule.
 - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - e. Requested substitution is compatible with other portions of the Work.
 - f. Requested substitution has been coordinated with other portions of the Work.
 - g. Requested substitution provides specified warranty.
 - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Not allowed unless otherwise indicated.
- C. Substitutions for Convenience: Architect will consider requests for substitution if received within 60 days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.
 - 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
 - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include

compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.

- b. Requested substitution does not require revisions to the Contract Documents.
- c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
- d. Substitution request is fully documented and properly submitted.
- e. Requested substitution will not adversely affect Contractor's construction schedule.
- f. Requested substitution has received necessary approvals of authorities having jurisdiction.
- g. Requested substitution is compatible with other portions of the Work.
- h. Requested substitution has been coordinated with other portions of the Work.
- i. Requested substitution provides specified warranty.
- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION

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**SECTION 01 2600
CONTRACT MODIFICATION PROCEDURES**

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 handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Section 01 2500 "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue through the General Contractor as supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time, on AIA Document G710.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within 10 days, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms acceptable to Architect.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to Architect.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.

6. Comply with requirements in Section 01 2500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.
7. Proposal Request Form: Use form acceptable to Architect.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, Architect will issue a Change Order for signatures of Owner and Contractor on AIA Document G701.

1.6 CONSTRUCTION CHANGE DIRECTIVE

- A. Construction Change Directive: Architect may issue a Construction Change Directive on AIA Document G714. Construction Change Directive instructs Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
- B. Documentation: Maintain detailed records on a time and material basis of work required by the Construction Change Directive.
 1. After completion of change, submit an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2600

**SECTION 01 2900
PAYMENT PROCEDURES**

PART 1 - GENERAL

- 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 necessary to prepare and process Applications for Payment.
- B. Related Requirements:
1. Section 01 2600 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 2. Section 01 3216 "Construction Progress Schedule" for administrative requirements governing the preparation and submittal of the Contractor's construction schedule.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Contractor allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Contractor's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 2. Submit the schedule of values to Architect **through General Contractor** at earliest possible date, but no later than **seven** days before the date scheduled for submittal of initial Applications for Payment.
 3. Sub-schedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide sub-schedules showing values coordinated with each phase of payment.
 4. Sub-schedules for Separate Elements of Work: Where the Contractor's construction schedule defines separate elements of the Work. Provide sub-schedules showing values coordinated with each element.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Architect.
 - c. Architect's Project number.
 - d. Contractor's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of **AIA Document G703**.
 3. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.

- 3) Equipment.
4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Provide multiple line items for principal subcontract amounts in excess of three percent of the Contract Sum.
5. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site.
6. Allowances: Provide a separate line item in the schedule of values for each allowance. Show line-item value of unit-cost allowances, as a product of the unit cost, multiplied by measured quantity. Use information indicated in the Contract Documents to determine quantities.
7. Overhead Costs: Include total cost and proportionate share of general overhead and profit for each line item.
8. Overhead Costs: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
9. Closeout Costs: Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling three percent of the Contract Sum and subcontract amount.
10. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified by Architect and paid for by Owner.
- B. Payment Application Times: The date for each progress payment is indicated in the Agreement between Owner and Contractor. The period of construction work covered by each Application for Payment is the period indicated in the Agreement.
- C. Payment Application Times: Submit Application for Payment to Architect by the 30th of the month. The period covered by each Application for Payment is one month, ending on the **last day of the month**.
 1. Submit draft copy of Application for Payment **seven** days prior to due date for review by Architect.
- D. Application for Payment Forms: Use **AIA Document G702 and AIA Document** as form for Applications for Payment.
- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. **Architect** will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
- F. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.

2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- G. Transmittal: Submit **three** signed and notarized original copies of each Application for Payment to **Architect** by a method ensuring receipt **within 24 hours**. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- H. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from **entities lawfully entitled to file a mechanic's lien arising out of the Contract and related to the Work covered by the payment**.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.
- I. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
 1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Combined Contractor's construction schedule (preliminary if not final) incorporating Work of multiple contracts, with indication of acceptance of schedule by each Contractor.
 5. Products list (preliminary if not final).
 6. Sustainable design action plans, including preliminary project materials cost data.
 7. Schedule of unit prices.
 8. Submittal schedule (preliminary if not final).
 9. List of Contractor's staff assignments.
 10. List of Contractor's principal consultants.
 11. Copies of building permits.
 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 13. Initial progress report.
 14. Report of preconstruction conference.
 15. Certificates of insurance and insurance policies.
 16. Performance and payment bonds.
- J. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
 1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.

- K. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. AIA Document G706.
 5. AIA Document G706A.
 6. AIA Document G707.
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 2900

**SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project Coordination
 - 1. Project coordinator
 - 2. Coordination procedures
- B. Project Meetings:
 - 1. Preconstruction meeting
 - 2. Progress meetings
- C. Construction Progress Documentation:
 - 1. Construction progress schedule
 - 2. Progress photographs
- D. Submittal Procedures:
 - 1. Submittals for review, information, and project closeout.
 - 2. Submittal distribution

1.2 RELATED REQUIREMENTS

- A. Section 01 7000 - Execution Requirements:
- B. Section 01 7700 – Contract Closeout Requirements.

1.3 PROJECT COORDINATION

- A. Project Coordinator: General Contractor.
- B. Coordinate locations of field offices and sheds, vehicle access, equipment and parking facilities.
- C. Establish procedures for intra-project communications; submittals, reports and records, schedules, coordination drawings, and recommendations; and resolution of ambiguities and conflicts.
- D. Comply with the Owner's requirements for use of temporary utilities and construction facilities.
- E. Coordinate field engineering and layout work.
- F. Make the following submittals to Architect:
 - 1. Requests for interpretation.
 - 2. Requests for substitution.
 - 3. Shop drawings, product data, and samples.
 - 4. Test and inspection reports.
 - 5. Design data.
 - 6. Manufacturer's instructions and field reports.
 - 7. Applications for payment and change order requests.
 - 8. Progress schedules.
 - 9. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PRECONSTRUCTION MEETING

- A. Architect will schedule a meeting after Notice of Award.
- B. Attendees:
 - 1. Owner.
 - 2. Architect and subconsultants.
 - 3. Contractor.
- C. Agenda:
 - 1. Execution of Owner- Contractor Agreement.
 - 2. Submission of executed bonds and insurance certificates.
 - 3. Distribution of Contract Documents.
 - 4. Submission of list of Subcontractors, list of Products, schedule of values, and progress schedule.

5. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
 6. Scheduling.
- D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.2 PROGRESS MEETINGS

- A. Schedule and administer meetings throughout progress of the Work at maximum weekly intervals.
- B. Contractor will make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.
- C. Attendance Required: Job superintendent, major Subcontractors and suppliers, Owner and Architect.
- D. Agenda:
1. Review minutes of previous meetings.
 2. Review of Work progress.
 3. Field observations, problems, and decisions.
 4. Identification of problems that impede, or will impede, planned progress.
 5. Review of submittals schedule and status of submittals.
 6. Review of off-site fabrication and delivery schedules.
 7. Maintenance of progress schedule.
 8. Corrective measures to regain projected schedules.
 9. Planned progress during succeeding work period.
 10. Coordination of projected progress.
 11. Maintenance of quality and work standards.
 12. Effect of proposed changes on progress schedule and coordination.
 13. Other business relating to Work.
- E. Contractor to record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.3 CONSTRUCTION PROGRESS SCHEDULE

- A. Within 10 days after date of the Agreement, submit Construction Progress Schedule. Supply manpower as required to meet or exceed published schedule.
- B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.
- C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review. Include written certification that major Subcontractors have reviewed and accepted proposed schedule.
- D. Within 10 days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment.

3.4 SUBMITTALS FOR REVIEW

- A. When the following are specified in individual sections, submit them for review:
1. Product data.
 2. Shop drawings.
 3. Samples for selection.
 4. Samples for verification.
- B. Submit to Architect for review for the limited purpose of checking for conformance with information given and the design concept expressed in the contract documents.
- C. Samples will be reviewed only for aesthetic, color, or finish selection.
- D. After review, provide copies and distribute in accordance with submittal procedures article below and for record documents purposes described in section 01 7700 – Contract Closeout Requirements.

3.5 SUBMITTALS FOR INFORMATION

- A. When the following are specified in individual sections, submit them for information:
1. Design data.

2. Certificates.
 3. Test reports.
 4. Inspection reports.
 5. Manufacturer's instructions.
 6. Manufacturer's field reports.
 7. Other types indicated.
- B. Submit for Architect's and Owner's information.
- C. See example of Architect's Submittal Review stamp at the end of this Section.

3.6 SUBMITTALS FOR PROJECT CLOSEOUT

- A. When the following are specified in individual sections, submit them at project closeout:
1. Project record documents.
 2. Operation and maintenance data.
 3. Warranties.
 4. Bonds.
 5. Extra materials (attic stock).
 6. Keys and extra parts.
 7. Other types as indicated.
- B. Submit for Owner's benefit during and after project completion.

3.7 NUMBER OF COPIES OF SUBMITTALS

- A. Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.
- B. Documents for Project Closeout: Make one reproduction of submittal originally reviewed. Submit one extra of submittals for information.
1. Submit on disk in electronic format one copy for Architect.
 2. Submit on disk in electronic format one copy and one paper hard copy for the Owner.
- C. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
1. After review, produce duplicates.
 2. Retained samples will not be returned to Contractor unless specifically so stated.

3.8 SUBMITTAL PROCEDURES

- A. Transmit each submittal with approved form.
- B. Transmit each submittal with cover sheet supplied, via electronic process.
- C. Sequentially number the transmittal form. Revise submittals with original number and a sequential alphabetic suffix.
- D. Identify Project, Contractor, Subcontractor or supplier; pertinent drawing and detail number, and specification section number, as appropriate on each copy.
- E. Apply Contractor's stamp, signed, certifying that review, approval, verification of Products required, field dimensions, adjacent construction Work, and coordination of information is in accordance with the requirements of the Work and Contract Documents.
- F. Deliver submittals to Architect's business address or email address.
- G. Schedule submittals to expedite the Project, and coordinate submission of related items.
- H. For each submittal for review, allow 10 days excluding delivery time to and from the Contractor.
1. For items requiring special coordination with other project elements or with the Architect's subconsultants, allow additional time as determined by the Architect.
- I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of the completed Work.
- J. Provide space for Contractor, Engineer and Architect review stamps.
- K. When revised for resubmission, identify all changes made since previous submission.
- L. Distribute reviewed submittals as appropriate. Instruct parties to promptly report any inability to comply with requirements.
- M. Submittals not requested will not be recognized or processed.

END OF SECTION 01 3000

Submittal Review

<input type="checkbox"/> Approved	<input type="checkbox"/> Approved as noted
<input type="checkbox"/> Revise & Resubmit	<input type="checkbox"/> Rejected
<input type="checkbox"/> No review completed	<input checked="" type="checkbox"/> Reviewed
<input type="checkbox"/> Item submitted, not required for review	<input type="checkbox"/> Other

Contractor submittals, such as shop drawings, product data, samples and other data are reviewed only for the limited purpose of checking for conformance with the design concept and the information expressed in the contract documents. This review shall not include review of the accuracy or completeness or details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with the other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. This review shall be conducted with reasonable promptness while allowing sufficient time for adequate review. Review of specific items shall not indicate review of the entire assembly of which the item is a component. The Architect shall not be responsible for any deviations from the contract documents not brought to the attention of the Architect in writing by the Contractor. Any deviation from the contract documents shall be clearly indicated to the Architect. The Architect assumes no responsibility for any deviation which is not clearly marked. Reviews of partial submissions for which submissions of correlated items have not been received are not accepted.

TC Architects, Inc.

By: RCY

Date: May 04, 2018

**SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Construction progress schedule, bar chart type.

1.2 RELATED SECTIONS

- A. Section 01 3000 - Administrative Requirements

1.3 SUBMITTALS

- A. Within five (5) days after date of the Agreement, submit preliminary schedule defining planned operations and phasing for the first 60 days of Work, with a general outline for remainder of Work.
- B. If preliminary schedule requires revision after review, submit revised schedule within five (5) days.
- C. Within five (5) days after review of preliminary schedule, submit draft of proposed complete schedule for review.
 - 1. Include written certification that major contractors have reviewed and accepted proposed schedule.
- D. Within five (5) days after joint review, submit complete schedule.
- E. Submit updated schedule with each Application for Payment or as requested by the Architect or Owner.

1.4 SCHEDULE FORMAT

- A. Listings: In chronological order according to the start date for each activity. Identify each activity with the applicable specification section number.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification section number.
- C. Identify work of separate stages and other logically grouped activities.
- D. Provide sub-schedules to define critical portions of the entire schedule.
- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- F. Provide legend for symbols and abbreviations used.

3.2 BAR CHARTS

- A. Include a separate bar for each major portion of Work or operation.
- B. Identify the first work day of each week.

3.3 REVIEW AND EVALUATION OF SCHEDULE

- A. Participate in joint review and evaluation of schedule with Architect at each submittal.
- B. Evaluate project status to determine work behind schedule and work ahead of schedule.
- C. After review, revise as necessary as result of review, and resubmit within 3 days.

3.4 UPDATING SCHEDULE

- A. Maintain schedules to record actual start and finish dates of completed activities.
- B. Indicate progress of each activity to date of revision, with projected completion date of each activity.
- C. Annotate diagrams to graphically depict current status of Work.
- D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

- E. Indicate changes required to maintain Date of Substantial Completion.
- F. Submit reports required to support recommended changes.
- G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect including the effects of changes on schedules of separate contractors.

3.5 DISTRIBUTION OF SCHEDULE

- A. Distribute copies of updated schedules to Architect, Owner, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections shown in schedules.

END OF SECTION 01 3216

**SECTION 01 4000
QUALITY REQUIREMENTS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section includes quality assurance and quality control services to be provided by the General Contractor under the terms of the Contract. Refer to Definitions Article below for definitions of the terms used herein.
 - 1. Quality assurance services include but are not limited to the following:
 - a. Qualification of sources, manufacturers, fabricators, support service providers, testing and inspection agencies and installers.
 - b. Pre-construction testing procedures specified to be the General Contractor's responsibility.
 - c. Delegated design proposals.
 - d. Representative construction assemblies, activities, or processes.
 - e. Field measurements and surveys.
 - f. Evaluation of project conditions and corrective measures.
 - g. Manufacturer construction process monitoring.
 - h. Construction documentation.
 - 2. Quality control services include but are not limited to the following:
 - a. Post-installation quality control testing.
 - b. Inspection of installed work.
 - c. Scheduling required inspections.
 - d. Scheduling inspections for special project warranties.
 - e. Correction of deficient or defective work.
 - f. Re-testing following correction of deficient or defective work.

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and ensure that proposed construction complies with the Contract Documents.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to verify that completed construction complies with the Contract Documents. Services do not include contract administration activities performed by Architect or Contractor.
- C. Representative Construction:
 - 1. Mock-ups: Representative assemblies of dissimilar materials to verify understanding of the work of the Contract.
 - 2. Field Samples: Application of finish materials to verify the applicator's skill in performing the work.
 - 3. Field Demonstrations: Demonstration of a construction process or a portion thereof to verify understanding of the Work of the Contract.
- D. Qualified Testing Agency: An entity with the experience and capability to conduct the specified testing and inspecting procedures, as documented by ASTM E 548, and that specializes in types of tests and inspections to be performed.
- E. Qualified Professional Engineer: A licensed professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated.
- F. Qualified Factory-Authorized Service Representative: An authorized representative who is trained and approved by a specified manufacturer to inspect and service the manufacturer's installed products.

- G. Qualified Fabricator: A firm experienced in fabricating products of the design indicated to those indicated for this Project and with sufficient production capacity to produce required units in accordance with the Contract Documents and the Project Schedule.
- H. Qualified Material Supplier: A firm with documented capability to produce specified materials of sufficient quality and quantity to service the Project in compliance with the Contract Documents and the Project Schedule.
- I. Qualified Manufacturer: A firm experienced in manufacturing the specified products or systems and with sufficient resources to produce specified products or systems in accordance with the Contract Documents and the Project Schedule.
- J. Qualified Product Distributor: A firm authorized by the specified product manufacturer to distribute the product in the Project vicinity and having sufficient product or material inventory access, service personnel, and distribution resources to adequately service the Project in accordance with the Contract Documents and the Project Schedule.
- K. Qualified Construction Support Service Provider: A firm with sufficient labor, equipment, and/or supply resources to provide construction-related services in sufficient quantity and quality to comply with the Contract Documents and Project Schedule.
- L. Qualified Installer: A firm or individual experienced in installing, erecting, or assembling work for this Project in compliance with the Contract Documents and the Project Schedule.
- M. Qualified Specialists: A firm or individual with documented qualifications to perform certain critical construction activities in accordance with the Contract Documents and the Project Schedule. Specialists shall satisfy qualification requirements indicated and shall be engaged for the activities indicated.
 - 1. Requirement for specialists shall not supersede building codes and similar regulations governing the Work, nor interfere with local trade-union jurisdictional settlements and similar conventions.

1.4 SUBMITTALS

- A. Design Data: Submit for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- B. Test Reports: After each test/inspection, promptly submit one electronic copy of report to Architect, applicable Engineer(s) and Owner.
 - 1. Include:
 - a. Date issued.
 - b. Project title and number.
 - c. Name of inspector.
 - d. Date and time of sampling or inspection.
 - e. Identification of product and specifications section.
 - f. Location in the Project.
 - g. Type of test/inspection.
 - h. Date of test/inspection.
 - i. Results of test/inspection.
 - j. Conformance with Contract Documents.
 - k. Interpretation of results.
 - 2. Test report submittals are for Architect's knowledge as contract administrator for the limited purpose of assessing conformance with information given and the design concept expressed in the contract documents, or for Owner's information.
- C. Certificates: When specified in individual specification sections, submit certification by the manufacturer and installation/application subcontractor to Architect, in quantities specified for Product Data.
 - 1. Indicate material or product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
 - 2. Certificates may be recent or previous test results on material or product, but must be acceptable to Architect.
- D. Manufacturer's Instructions: When specified in individual specification sections, submit printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, for the

Owner's information. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.

- E. Manufacturer's Field Reports: Submit reports for Architect's benefit as contract administrator or for Owner.
 - 1. Submit report digitally within 3 days of observation to Architect for information.
 - 2. Submit for information for the limited purpose of assessing conformance with information given and the design concept expressed in the contract document.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.1 CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply with manufacturers' instructions, including each step in the sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Have Work performed by persons qualified to produce required and specified quality.
- F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.
- G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

3.2 TOLERANCES

- A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.
- B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Adjust products to appropriate dimensions; position before securing products in place.

3.3 MANUFACTURERS' FIELD SERVICES

- A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.
- B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.4 TESTING AND INSPECTION

- A. See individual specification sections for testing required.
- B. Testing Agency Duties:
 - 1. Provide qualified personnel at site. Cooperate with Architect and General Contractor in performance of services.
 - 2. Perform specified sampling and testing of products in accordance with specified standards.
 - 3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
 - 4. Promptly notify Architect and General Contractor of observed irregularities or non-conformance of Work or products.
 - 5. Perform additional tests and inspections required by Architect.
 - 6. Submit reports of all tests/inspections specified.

3.5 DEFECT ASSESSMENT

- A. Repair visual defects to the satisfaction of the Architect and Owner. If repairs cannot be made satisfactorily, replace items so designated.
- B. Replace Work or portions of the Work not conforming to specified requirements.
- C. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct an appropriate remedy or adjust payment.

END OF SECTION 01 4000

**SECTION 01 4100
REGULATORY REQUIREMENTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. 28 CFR 35 - Department of Justice accessibility regulations relating to State and local governments; current edition.
- B. 28 CFR 36 - Department of Justice accessibility regulations relating to public accommodations; current edition.
- C. 49 CFR 27, 37, and 38 - Transportation for Individuals with Disabilities; Final Rule; Department of Transportation; current edition.
- D. ANSI A117.1 (2009), Standard for Accessible and Usable Buildings and Facilities as mandated by law and incorporated by reference by the States and Municipalities, including Ohio in the Ohio Administrative Code 4401:8-44-01
- E. 29 CFR 1910 - Occupational Safety and Health Standards; current edition.

1.2 RELATED REQUIREMENTS

- A. Section 01 4000 - Quality Requirements.

1.3 QUALITY ASSURANCE

- A. Designer Qualifications: Where delegated engineering design is to be performed under the construction contract provide the direct supervision of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION - NOT USED

END OF SECTION 01 4100

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**SECTION 01 4123
PERMIT REQUIREMENTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. The Contractor will be responsible for obtaining and paying for all permits, licenses, tap fees, and other local requirements for constructing the Project.

1.2 SUBMITTALS

- A. For the Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 4123

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**SECTION 01 4216
DEFINITIONS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative requirements for definitions. Refer to Divisions 02 through 32 for specific references.

1.2 DEFINITIONS

- A. General: Basic contract definitions are included in the Conditions of the Contract.
- B. **"Indicated"**: The term "indicated" refers to graphic representations, notes, or schedules on the Drawings; or to other paragraphs or schedules in the Specifications and similar requirements in the Contract Documents. Terms such as "shown," "noted," "scheduled," and "specified" are used to help the user locate the reference. Location is not limited.
- C. **"Directed"**: Terms such as "directed," "requested," "authorized," "selected," "approved," "required," and "permitted" mean directed by the Architect, requested by the Architect, and similar phrases.
- D. **"Approved"**: The term "approved," when used in conjunction with the Architect's action on the General Construction's submittals, applications, and requests, is limited to the Architect's duties and responsibilities as stated in the Conditions of the Contract. Refer to Section 01330 - "Submittal Procedures" for additional terms and phrases regarding review/approval/rejection as they relate to submittal procedures.
- E. **"Regulations"**: The term "regulations" includes laws, ordinances, statutes, and lawful orders issued by authorities having jurisdiction, as well as rules, conventions, and agreements within the construction industry that control performance of the Work.
- F. **"Furnish"**: The term "furnish" means to supply and deliver to the Project site, ready for unloading, unpacking, assembly, installation, and similar operations.
- G. **"Install"**: The term "install" describes operations at the Project site including the actual unloading, temporary storage, unpacking, assembling, erecting, placing, anchoring, applying, working to dimension, finishing, curing, protecting, cleaning, and similar operations.
- H. **"Provide"**: The term "provide" means to furnish and install, complete and ready for the intended use.
- I. **"Installer"**: An installer is the Contractor or another entity engaged by the Contractor, either as an employee, subcontractor, or contractor of lower tier, to perform a particular construction activity, including installation, erection, application, or similar operations. Installers are required to be experienced in the operations they are engaged to perform.
1. The term "experienced," when used with the term "installer," means having successfully completed a minimum of five previous projects similar in size and scope to this Project; being familiar with the special requirements indicated; and having complied with requirements of authorities having jurisdiction.
 2. Trades: Using a term such as "carpentry" does not imply that certain construction activities must be performed by accredited or unionized individuals of a corresponding generic name, such as "carpenter." It also does not imply that requirements specified apply exclusively to tradespersons of the corresponding generic name.
 3. Assigning Specialists: Certain Sections of the Specifications require that specific construction activities shall be performed by specialists who are recognized experts in those operations. The specialists must be engaged for those activities, and their assignments are requirements over which the Contractor has no option. However, the ultimate responsibility for fulfilling contract requirements remains with the Contractor.
 - a. This requirement shall not be interpreted to conflict with enforcing building codes and similar regulations governing the Work. It is also not intended to interfere with local trade-union jurisdictional settlements and similar conventions.
- J. Product-Related Definitions:
1. **"Products"** are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.

2. **"Materials"** are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 3. **"Equipment"** is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
 4. **"Systems"** are sets of complementary materials or products arranged or combined by a manufacturing concern so as to form a unity or whole for fulfilling a specific building (or site) function.
 5. **"Damage"** shall mean a substandard or impaired condition of a product, including breakage, surface blemishes, abrasion, caused by weather exposure, accident, abuse, aging, mis-handling, storage, shipping, or other causes.
 6. A **"Substitution"** is a product not specified and which substantially deviates from the specified requirements.
- K. **"Project site"** is the space available to the Contractor for performing construction activities, either exclusively or in conjunction with others performing other work as part of the Project. The extent of the Project site is shown on the Drawings and may or may not be identical with the description of the land on which the Project is to be built.
- L. **"Testing Agencies"**: A testing agency is an independent entity engaged to perform specific inspections or tests, either at the Project site or elsewhere, and to report on and, if required, to interpret results of those inspections or tests.

1.3 SPECIFICATION FORMAT AND CONTENT EXPLANATION

- A. Specification Format: These Specifications are organized into Divisions and Sections based on the 50-division format and CSI/CSC's "MasterFormat" numbering system.
- B. Specification Content: These Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
1. Abbreviated Language: Language used in the Specifications and other Contract Documents is abbreviated. Words and meanings shall be interpreted as appropriate. Words implied, but not stated, shall be interpolated as the sense requires. Singular words shall be interpreted as plural and plural words interpreted as singular where applicable as the context of the Contract Documents indicates.
 2. Imperative mood and streamlined language are generally used in the Specifications. Requirements expressed in the imperative mood are to be performed by the Contractor. At certain locations in the Section Text, subjective language is used for clarity to describe responsibilities that must be fulfilled indirectly by the Contractor or by others when so noted.
 - a. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 4216

**SECTION 01 4219
REFERENCE STANDARDS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section includes administrative requirements for references.
- B. Specific references are in subsequent specification sections.

1.3 INDUSTRY STANDARDS

- A. Applicability of Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference.
- B. Publication Dates: Comply with standards in effect as of the date of the Contract Documents.
- C. Copies of Standards: Each entity engaged in construction on the Project must be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents.
- D. Where copies of standards are needed to perform a required construction activity, the Contractor shall obtain copies directly from the publication source and make them available on request.
- E. Abbreviations and Names: Trade association names and titles of general standards are frequently abbreviated. Where abbreviations and acronyms are used in the Specifications or other Contract Documents, they mean the recognized name of the trade association, standards-producing organization, authorities having jurisdiction, or other entity applicable to the context of the text provision. Refer to Gale Research's "Encyclopedia of Associations" or Columbia Books' "National Trade & Professional Associations of the U.S.," which are available in most libraries.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 4219

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**SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Temporary utilities.
- B. Temporary telecommunications services.
- C. Temporary sanitary facilities.
- D. Temporary Controls: Barriers, enclosures, and fencing.
- E. Security requirements.
- F. Vehicular access and parking.
- G. Waste removal facilities and services.
- H. Construction sign.

1.2 RELATED REQUIREMENTS

- A. Section 02 4119 - Selective Demolition

1.3 TEMPORARY UTILITIES

- A. The Owner will allow use of existing building electrical service, water and sanitary facilities without charge.

1.4 TELECOMMUNICATIONS SERVICES

- A. Provide, maintain, and pay for telecommunications services for the on-site meetings at time of project mobilization.

1.5 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
- B. Provide barricades and covered walkways required by governing authorities for public rights-of-way and for public access to existing building.
- C. Provide protection for plants designated to remain. Replace damaged plants.
- D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.
- E. Traffic Controls: as required for maintenance of existing tenants in occupied buildings.

1.6 FENCING

- A. Construction: Contractor's option as required to secure their work areas. The contractor is responsible to protect all in progress work and materials and equipment as no additional cost or risk to the owner.

1.7 SECURITY

- A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.8 VEHICULAR ACCESS AND PARKING

- A. Comply with regulations relating to use of streets and sidewalks, access to emergency facilities, and access for emergency vehicles.
- B. Coordinate access and haul routes with governing authorities.
- C. Provide and maintain access to fire hydrants, free of obstructions.
- D. Provide means of removing mud from vehicle wheels before entering streets.
- E. Provide temporary parking areas to accommodate construction personnel. If available site space is not adequate, provide additional off-site parking.

1.9 WASTE REMOVAL

- A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.
- B. Provide containers with lids. Remove trash from site periodically.

- C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.
- D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.10 PROJECT SIGNS

- A. One painted sign, 48 sq ft area, bottom 6 feet above ground.
- B. Content:
 - 1. Project number, title, logo and name of Owner as indicated on Contract Documents.
 - 2. Names and titles of authorities.
 - 3. Names and titles of Architect and Consultants.
 - 4. Name of Prime Contractor and major Subcontractors.
- C. Lettering: Standard Alphabet Series C, as specified in FHWA Standard Highway Signs (SHS).

1.11 ON-SITE MEETINGS

- A. Provide tables and chairs as needed for project meetings.

1.12 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

- A. Remove temporary utilities, equipment, facilities, materials, prior to Substantial Completion inspection.
- B. Remove underground installations to a minimum depth of 2 feet. Grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore existing facilities used during construction to original condition.
- E. Restore new permanent facilities used during construction to specified condition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION 01 5000

**SECTION 01 6000
PRODUCT REQUIREMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. This Section contains product requirements that apply to all sections of the Specifications.

1.3 DEFINITIONS

- A. Definitions used in this Article are not intended to change the meaning of other terms used in the Contract Documents, such as "specialties," "systems," "structure," "finishes," "accessories," and similar terms. Such terms are self-explanatory and have well-recognized meanings in the construction industry.
 - 1. **"Products"** are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 2. **"Materials"** are products substantially shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.
 - 3. **"Equipment"** is a product with operational parts, whether motorized or manually operated, that requires service connections, such as wiring or piping.
 - 4. **"Systems"** are sets of complementary materials or products arranged or combined by a manufacturing concern so as to form a unity or whole for fulfilling a specific building (or site) function.
 - 5. **"Damage"** shall mean a substandard or impaired condition of a product, including breakage, surface blemishes, abrasion, caused by weather exposure, accident, abuse, aging, mis-handling, storage, shipping, or other causes.
 - 6. A **"Substitution"** is a product not specified and which substantially deviates from the specified requirements.

1.4 SUBMITTALS

- A. Product Schedule: Prepare in tabular format a schedule of the specified products to be supplied for the Project (Do not propose substitutions in the Product Schedule). Organize the schedule according to the numbers and titles of each Section. Coordinate the Schedule of Products with the Submittal Schedule. Submit to the Architect not less than seven (7) days following the Notice to Proceed. Schedule content shall include, as a minimum, the following information:
 - 1. Name of Manufacturer.
 - 2. Product designation, such as brand and model number.
 - 3. Applicable reference standards.
- B. Upon completion of the Project, submit a final Product Schedule for record. Include in the Operation and Maintenance manuals.

1.5 BASIC PRODUCT REQUIREMENTS

- A. Furnish all products new and unused, and in manufacturer's standard unit dimensions, unless specifically identified otherwise in the Contract Documents. Scraps, remnants, salvage, or otherwise objectionable materials will be rejected by the Architect.
- B. Ensure that each type of product is produced by a single manufacturer, the same production run and obtained through distribution sources authorized by the manufacturer of each product required, unless otherwise approved by the Architect.
- C. All products described in the Contract Documents shall be furnished complete, with all necessary fasteners, accessories, installation devices, and appurtenances required for a complete installation.

- D. All auxiliary components required for proper installation and performance of all products shall be produced and/or approved for the proposed application by the manufacturer of the primary product components.
- E. The Contractor shall verify that products requiring electrical service are compatible with the electrical service available at the Project.

1.6 PRODUCT OPTIONS

- A. The Contractor shall select products which comply with the Contract Documents and which are compatible with each other, with existing work, and with products provided by others.
- B. Manufacturer product references, model numbers, and other proprietary designations used in subsequent sections of the Specifications shall be regarded as minimum standards by which equivalent products by other listed manufacturers should be evaluated and selected.
 - 1. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction.
 - 2. Performance characteristics are indicated by criteria subject to verification by one or more methods including preconstruction testing, field testing, and in-service performance.
 - 3. Products of other listed manufacturers shall meet or exceed the design requirements represented by specified proprietary designations.
- C. The Contractor is to provide the products specifically listed in the construction documents. Only when multiple manufacturers are listed, the Contractor may choose from among those products listed.
- D. Do not make unauthorized substitutions for products or manufacturers listed. Refer to General Conditions of the Contract for substitution procedures.

1.7 PRODUCT SUBSTITUTION PROCEDURES

- A. The following are administrative procedures for substitutions proposed following Award of Contract.
 - 1. Procedures for proposal of substitutions during the bidding period are specified in "Instructions to Bidders."
- B. Do not submit substitution proposals during the period between the Bid Due Date and Contract Award unless requested by the Architect.
- C. Substitutions following Award of Contract will not be considered except under the following circumstances:
 - 1. Through no fault of the Contractor, the specified products become unavailable as a result of changes in manufacturing, product recalls, supply chain disruptions, changes in laws and regulations, or similar conditions.
 - 2. The Architect and Owner agree to consider Value Engineering proposals.
 - 3. A change of design requirements by the Architect.
- D. The Contractor shall not make substitutions for specified products without submitting a formal request for substitution followed by written approval from the Architect. Unauthorized substitutions will be rejected by the Architect, and the Contractor shall assume all costs for correction or replacement with specified products, whether or not the specifications state that substitutions will not be considered.
- E. Specification requirements indicating that a substitution will not be considered include:
 - 1. "Provide one of the following products:"
 - 2. "Provide Products produced by one of the manufacturers listed."
 - 3. "No Substitutions"
- F. The Contractor shall not assume that the absence of one of the above phrases constitutes permission to make substitutions.
- G. In making requests for substitution, the Contractor shall:
 - 1. Identify the specified product for which the substitution is being proposed.
 - 2. Identify the proposed substitution by manufacturer, model number, series, and other proprietary terms of identification.

3. Provide sufficient information for the Architect to evaluate the proposed substitution, including, as applicable:
 - a. product data
 - b. manufacturer's literature
 - c. test reports
 - d. independent research evaluations
 - e. details of fabrication and installation
 - f. maintenance instructions, availability of maintenance parts, and current price list for those parts.
 - g. Name, address, and telephone number of the manufacturer's local representative.
 - h. warranty information
 - i. list of prior installations in the vicinity of the project, including locations, dates of installations, and names of building owners.
 - j. Manufacturer's written endorsement of the installer of the proposed product.
4. Furnish a written statement of the net change in the Contract Sum if the substitution is accepted.
5. Furnish a written justification for the substitution in lieu of the specified product.
- H. Allow at least ten (10) business days for the Architect's review and response to substitution requests. The Architect will review substitution proposals and respond to the Contractor writing. The Architect's decision regarding substitution proposals shall be considered final.
- I. The Architect may reject without consideration the following:
 1. Incomplete requests for substitution.
 2. Substitution requests made when a specification section indicates that no substitutions will be considered for a product.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Scheduling: Schedule deliveries to the Site (or other approved location) at times consistent with the progress of the Work to ensure that products do not undergo exposure to unsuitable conditions.
- B. Provide an appropriate level of labor forces and equipment at the site for the proper unloading and handling of products.
- C. Packaging and Identification: Deliver products in original packaging or bundles and labeled so as to be readily identifiable and so that assessment of their condition, quantity, and other qualitative characteristics can be readily performed. Obtain receipts for bulk product deliveries clearly stating the type, grade, quantity and other specified characteristics.
- D. Inventory and Inspection: Inventory products upon receipt to ensure that adequate quantities are delivered at proper intervals so as to maintain the progress of the work. Inspect products to evaluate and document their condition.
- E. Rejection and Re-ordering: Reject defective, broken, deteriorated or otherwise objectionable products and arrange for their immediate segregation and removal from the Project Site. Arrange for delivery of satisfactory products to replace those that have been rejected.
- F. Storage Conditions: Review manufacturer's literature and referenced standards to verify the optimum conditions required for proper and secure storage of each type of product to prevent deterioration, theft, or loss. Maintain such conditions and monitor them throughout the progress of the work. When existing conditions do not comply with referenced standards and manufacturer recommendations, provide and maintain all temporary protections, temporary utility services, and temporary support facilities required to maintain optimum conditions throughout the construction period.
 1. Do not store products in a manner that will impede the work of others or damage structures or excavations.
 2. If storage facilities are not available at the Site, provide bonded off-site storage facilities acceptable to the Owner.
- G. Handling: Handle products at all times during the progress of the work in accordance with the referenced standards and manufacturer's printed instructions.

1.9 EXTRA PRODUCTS

- A. Furnish extra products (a.k.a. attic stock or maintenance stock) in the quantities specified, or, when not specified, in the standard quantities customarily furnished by the manufacturer.
- B. Extra products shall be from the same runs as the products specified for the work described and shall be delivered to the site when the products to be incorporated into the work are delivered. Delivery, storage, and handling requirements specified herein apply to extra products.
- C. Furnish extra products in manufacturer's standard whole units, unless otherwise indicated. Scraps, remnants, salvage, or otherwise substandard items presented as extra products will be rejected by the Architect as non-complying.
- D. Furnish extra products in sealed containers or cartons, with manufacturer's name and product description clearly indicated on the packaging.
- E. Contractor shall compensate the Owner for extra products used by the Contractor for performing the work of the Contract or for performing corrective work during the specified correction period or warranty period.
- F. Retain signed receipts for each quantity of extra product delivered to the Owner's designated representative and submit them as a condition of Contract Closeout.

1.10 WARRANTIES

- A. The following requirements are applicable to warranties specified in individual Sections.
- B. Warranties shall not deprive the Owner of other rights provided by law or the Conditions of the Contract.
- C. Date of warranty period commencement shall be the Date of Owner occupancy, unless the Owner agrees to allow a different date of warranty commencement.
- D. Manufacturer Warranties: Unless more stringent warranty terms are specified within a Section, provide the manufacturer's standard product warranty for each product, running for the manufacturer's standard time period and according to the manufacturer's standard terms.
 - 1. Furnish executed copies of standard manufacturer warranties upon completion of the Project, whether or not the standard warranties are specified in the individual Sections.
- E. Special Project Warranties: When specified, provide special project warranties according to the terms and conditions specified in individual Sections. Submit notarized copies identifying the following:
 - F. Manufacturer's name, address, and telephone number.
 - G. Project title and address.
 - H. Owner's name and address.
 - I. Contractor's name and address.
 - 1. The specific terms and conditions of the warranty showing compliance with the terms specified in individual Sections.
 - 2. Date of Substantial Completion of the Project.
 - 3. Date of expiration of the warranty.
 - 4. Notarized signature of the manufacturer's authorized agent.
- J. The manufacturer shall notify the Owner and the Contractor in writing not less than 365 days prior to the expiration date of the warranty.
- K. Warranty Requirements:
 - 1. Corrections made under the terms of warranties shall include repair or replacement (as adjudged by the Owner) of interfacing work affected by the product defect.
 - 2. Corrected work shall be fully warranted to the extent of the original work.
 - 3. Perform warranty work in accordance with the Contract Documents applicable to the Work.
 - 4. Warranties that fail to account for the provisions in the Contract Documents will be rejected and re-submittal will be required.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION (NOT APPLICABLE)

END OF SECTION 01 6000

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**SECTION 01 7000
EXECUTION REQUIREMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section includes execution requirements applicable to all sections of these Specifications.

1.3 EXAMINATION

- A. Prior to installation of products or systems, with Installer present, review the condition of the substrate or area of installation provided and verify that it is acceptable in accordance with the product manufacturer's instructions, referenced standards, and accepted trade practices.
 - 1. Report unfavorable conditions to the Architect.
 - 2. Verify that reinforcement, blocking, nailers, or other attachment provisions required for support of work are properly placed.
 - 3. Do not allow installation to proceed until all unsatisfactory conditions have been corrected.
 - 4. Commencing work in an area will be considered acceptance of the existing conditions by that Installer.
- B. No allowance or change order will be made for conditions that, in the opinion of the Architect, were foreseeable during the bidding period or reasonably inferrable from the Contract Documents.

1.4 PREPARATION

- A. Install representative construction, such field samples, as specified in subsequent sections. Do not proceed with work execution until representative construction has been reviewed and approved by the Architect and Owner.
- B. Prepare materials for installation in accordance with referenced industry standards, manufacturer's instructions, and accepted trade practices. In exposed or finish work, mix or arrange materials for uniform blending and optimum arrangement according to the Architect's instructions.
- C. Lay out work in advance to ensure accurate spacing of surface patterns with uniform joint thicknesses and for accurate location of openings, joints, returns, and offsets.

Surface Preparation

 - 1. Furnish, install, maintain, and remove as required all necessary temporary protections to safeguard persons and property in the vicinity of the surface preparation area prior to commencement of surface preparation procedures, including but not limited to protection of MEP systems and existing adjacent construction.
 - 2. Prepare surfaces to receive work in accordance with manufacturer's instructions, referenced standards and accepted trade practices.

1.5 EXECUTION, GENERAL

- A. The work shall be performed by skilled and, where applicable, by licensed installers. Where indicated in the Contract Documents, installers shall be approved by the manufacturer for installing the materials in the manner indicated.
- B. Install work in accordance with recognized trade practices, unless more stringent installation requirements are described in the Contract Documents or in the approved manufacturer's published installation instructions. For materials or systems that are specified to receive warranties, Work shall also comply with the requirements of the manufacturer.
- C. Construct work to the full elevations, widths, and thicknesses shown.
- D. Leave openings for equipment to be installed before completing work. After installing equipment, complete work to match the construction immediately adjacent to the opening.

- E. As work progresses, build in items furnished under other sections.

1.6 FINISHING

- A. Except where specifically noted to remain unfinished, prepare, prime, and finish exposed elements of installed materials and products, whether or not indicated on the Finish Schedule, and in a manner acceptable to the Owner and Architect.
 1. Finish surfaces of installed work that are not pre-finished by the manufacturer or fabricator, including but not limited to metal, wood, cementitious elements, and paper-covered elements.
 2. Finishing includes but is not limited to, as applicable, insulating, filling, and sealing joints between frames and substrates, surface preparation, priming and painting or staining and sealing in accordance with the manufacturer's recommendations and the Owner's finish scheme.
 3. Final colors and sheen will be selected by the Architect.
 4. Do not conceal or paint over labels, warnings, tags, certificates, or other information required by authorities having jurisdiction.
 5. Refer to Division 09 Sections and the manufacturer's instructions for additional finishing requirements.
 6. Seal the backs and edges of wood, gypsum board, insulation, and other potentially absorptive materials that will be exposed to damp or humid conditions.
 7. Isolate dissimilar metals from each other to prohibit galvanic action with felts or other similar materials whether indicated or not.
 8. Isolate metals and other corrosion-sensitive materials from components containing deleterious or otherwise reactive chemicals, including but not limited to pressure-treated wood, solvents, and incompatible sealants.
 9. Fill and seal all voids around penetrations through the walls, floors and ceiling assembly.
 10. Assure that fasteners selected are of the correct type for the applications indicated, are corrosion-resistant, and will not react with the penetrated substrates when installed. Space fasteners appropriately. Provide pre-finished fasteners when required for aesthetic effect.
 11. Account for thermal movement of installed materials in executing the Work. Incorporate washers, gaskets, movement joints, and other appropriate means according to manufacturer instructions and referenced standards.
 12. Coat primed and unprimed ferrous metals with suitable finish systems approved by the Architect.
 13. Unless otherwise indicated, do not paint, stain, or otherwise coat stainless steel, chrome, bronze, brass, or other metals that have received a defined mechanical finish and are intended to remain exposed.
 14. Refer to subsequent Sections and the manufacturer's instructions for additional requirements.

1.7 INSPECTION

- A. When inspection and testing of installed work is required by authorities having jurisdiction over the Project, schedule and be present during such inspections and tests and promptly act upon recommendations.
- B. When review and inspection of work by a manufacturer representative is a condition of a special project warranty, schedule and oversee such reviews and inspections and promptly act upon recommendations.

1.8 CLEANING

- A. Progress Cleaning: As the Work progresses, the Contractor shall ensure that installed products are cleaned in accordance with the recommendations of the product manufacturer and referenced standards.

1.9 OPERATION AND ADJUSTMENT

- A. Start, operate, and adjust products in accordance with the manufacturer's instructions and recommendations to ensure proper function. Make adjustments or other remedial procedures as required.

1.10 DEMONSTRATION AND TRAINING

- A. Schedule demonstration and training sessions with Owner's facilities manager to review preventive maintenance procedures for operational building components.
 - 1. Engage manufacturer's authorized field technician to oversee and conduct demonstration and training activities.
 - 2. Review preventive maintenance procedures, including, as applicable, but not limited to:
 - a. Recommended schedule of maintenance procedures.
 - b. Lubrication of moving parts.
 - c. Replacement of belts, lamps, filters, and other components.
 - d. Cleaning procedures.
 - e. Troubleshooting procedures.
 - f. Warranty notification protocol.
- B. Schedule demonstration and training sessions with Owner's facilities manager to review cleaning procedures of all exposed surfaces.
- C. Obtain Owner's written statement that demonstration and training activities have been completed.

1.11 PROTECTION

- A. Provide all necessary protections to ensure that installed products are without damage or due deterioration as of the Date of Substantial Completion. Upon final acceptance of the work, remove temporary protections from the Project Site.

PART 2 – PRODUCTS (Not applicable)

PART 3 – EXECUTION (Not applicable)

END OF SECTION 01 7000

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**SECTION 01 7300
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. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products (refrigerators)
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
- B. Related Requirements:
 - 1. Section 01 1000 "Summary" for limits on use of Project site.
 - 2. Section 01 3000 "Administration Requirements".
 - 3. Section 01 7700 "Contract Closeout Requirements" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Section 02 4119 "Selective Demolition" for demolition and removal of selected portions of the building.
 - 5. Section 07 8400 "Firestopping" for patching penetrations in fire-rated 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 INFORMATIONAL SUBMITTALS

- A. Cutting and Patching Plan: Submit plan describing procedures at least 5 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 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.
 - a. Include description of provisions for temporary services and systems during interruption of permanent services and systems.
- B. Landfill Receipts: Submit copy of receipts issued by a landfill facility, licensed to accept hazardous materials, for hazardous waste disposal, if any.

1.5 QUALITY ASSURANCE

- A. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.

1. 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 result 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. Electrical wiring systems.
 - k. Operating systems of special construction.
 2. 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 result 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. Insulation
 - d. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 3. 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 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 utilities and construction indicated as existing are not guaranteed. Before beginning work, investigate and verify the existence and location of utilities, mechanical and electrical systems, and other 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 mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.

2. Examine walls, floors, and ceilings for suitable conditions where products and systems are to be removed.
 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. 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.
- B. 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.
- C. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- D. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- E. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- F. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- G. Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.
- H. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.
- I. Repair or remove and replace damaged, defective, or nonconforming Work.
1. Comply with Section 01 7700 " Contract Closeout Requirements " for repairing or removing and replacing defective Work.

3.3 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. Adjacent Occupied Areas: Where interference with use of adjoining areas or interruption of free passage to adjoining areas is unavoidable, coordinate cutting and patching according to requirements in Section 01 1000 "Summary."
- F. Existing Utility Services and Mechanical / Electrical Systems: Where existing services / systems are required to be removed, relocated, or abandoned, bypass such services / systems before cutting to minimize interruption to occupied areas. Follow Owner's standard notification for utility interruption / shut down.
- G. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, 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. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 4. Proceed with patching after construction operations requiring cutting are complete.
- H. 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.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. 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.
- I. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.4 **PROGRESS CLEANING**

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
 4. Coordinate progress cleaning for joint-use areas where multiple contractors are working concurrently.
- 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 01 5000 "Temporary Facilities and Controls."
- H. Limiting Exposures: Contractor is to 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.

3.5 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial 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 01 7300

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**SECTION 01 7423
PRE-OCCUPANCY CLEANING**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes cleaning procedures to be performed following construction operations and prior to occupancy by the Owner. All cleaning procedures shall be carried out according to the Owner's standard operating procedures, guidelines, and recommendations.

1.2 SUBMITTALS

- A. Submit a list all cleaning products proposed for use for the Owner's review and approval prior to application.
- B. Cleaning Company's Qualification Data: Submit written qualification data for the Contractor's proposed cleaning service, containing the information specified in the Quality Assurance article below, for the Owner's review and approval.
- C. Do not begin pre-occupancy cleaning procedures until the Owner has approved use of Cleaning Company and all submittals.

1.3 QUALITY ASSURANCE

- A. Cleaning Company Qualifications: The Contractor shall provide documentation of the following qualifications according to the Submittals article above.
 - 1. Contract cleaner shall be a professional company specializing in post-construction and maintenance cleaning of commercial buildings with not less than five (5) years in the cleaning industry.
 - 2. Contract cleaner shall employ bondable personnel.
 - 3. Contract cleaner shall assign trained personnel knowledgeable in the procedures of pre-occupancy and maintenance cleaning to the project site.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Cleaning agents and disinfectants shall be labeled with MSDS information stored in in construction areas according to each manufacturer's instructions.
- B. Disinfectants should be dispensed into clean, dry, appropriately-sized dispensing bottles that are clearly labeled and dated.

PART 2 - PRODUCTS

2.1 CLEANING PRODUCTS

- A. All cleaning products used in the Project shall comply with the Owner's standards.

PART 3 - EXECUTION

3.1 PRE-OCCUPANCY CLEANING

- A. Perform the pre-occupancy cleaning following approval of personnel and products by the Owner's Representative.
- B. Sequence: Begin pre-occupancy cleaning operations at the top floor and proceed down to the lower floor. Complete the cleaning required on each floor before proceeding to the next floor.
- C. Perform the pre-occupancy cleaning according to the Owner's standard procedures, including but not limited to the following requirements.
 - 1. Floor Maintenance:
 - a. Do not splash, disfigure, or damage baseboards, walls, stair risers, furniture or equipment during cleaning operations.
 - b. Take proper precautions to advise building occupants of wet and/or slippery floor conditions during the cleaning operations.
 - c. Sweeping and Mopping:
 - 1) Thoroughly sweep the floors to remove visible dirt and debris. Remove all visible paint marks and similar substances from floor surfaces.

- 2) After sweeping and damp mopping operations, all floors shall be clean and free of dirt streaks; no dirt shall be left in corners, behind equipment, under furniture, behind doors, on stair landings or treads. Entrances and all similar areas shall be swept clean of all dirt and trash.
 - d. Wet Mopping and Scrubbing: On completion of mopping, the floors shall be clean and free of dirt, water streaks, mop marks, string, etc., properly rinsed, and dry to present an overall appearance of cleanliness. All surfaces shall be dry and corners and cracks clean after the wet mopping or scrubbing.
 - e. Machine scrub concrete floors and wash with a germicidal cleaner.
 - f. Vacuum carpeting thoroughly using commercial grade vacuum equipment with filtering media acceptable to the Owner.
 - g. Sweep and mop luxury vinyl planks (LVP) and rubber flooring per manufacturer standards.
2. Dusting: Remove dust directly from the areas in which it lies by the most effective means such as appropriately treated dusting cloths, vacuum tools, etc. When doing high cleaning, dust shall not be allowed to fall from high areas onto furniture and equipment below. The following conditions shall exist after the completion of each dusting task:
 - a. There shall be no dust streaks.
 - b. Corners, crevices, moldings, and ledges shall be free of all dust.
 - c. There shall be no oils, spots or smudges on dusted surfaces caused by dusting tools.
 - d. When inspected by a flashlight, there shall be few traces of dust on any surface.
3. Damp Wiping: Use a clean damp cloth or sponge to remove all dirt, spots, streaks and smudges from walls, doors (both wood and metal), glass, countertops and other surfaces. When dry, the surfaces shall have a polished appearance. The wetting solution shall contain an appropriate cleaning agent.
 - a. When damp wiping in toilet rooms, an approved multi-purpose disinfectant cleaner shall be used.
4. Spot Cleaning: Following this operation, smudges, marks or spots shall be removed from the designated areas without causing unsightly discoloration.
5. Fixtures and Equipment:
 - a. Clean and disinfect all equipment and fixtures, including, but not limited to plumbing fixtures, mirrors, shelving, receptors, partitions, and dispensers.
 - b. Plumbing fixtures (tubs/showers, wash basins, sinks, toilets, etc.) shall be thoroughly washed, using a germicidal solution, and dried, leaving no dust, spots, streaks or stains, rust, mold, encrustation or excess moisture. The walls and floor adjacent to fixtures shall be free of spots, drippings and water marks.
 - c. Light fixtures, including lenses, cover panels, side panels, louvers, fixture frames and lamps, shall be vacuumed and cleaned with a damp cloth.
 - d. HVAC supply vents, exhaust grilles and room fan coil units shall be thoroughly vacuumed and cleaned with a damp cloth.
7. Walls:
 - a. Dust and spot clean painted walls. In areas where spot cleaning will produce color differences, the entire wall shall be washed, cleaned and wiped dry.
 - b. Damp wipe tiles walls. The entire tiled wall area shall be washed, cleaned and wiped dry.
8. Doors and Frames:
 - a. Touch up all marks on doors to match adjacent surfaces.

- b. Clean and polish all unpainted metal on doors, including, but not limited to, trim, hardware, kickplates, push / pull plates and door knobs / levers.
 - c. Doors and frames shall be thoroughly cleaned and wiped dry without damaging applied finishes.
9. Stairwells: Sweep all stairs clean if uses by construction personnel
10. Entrances: Thoroughly sweep, vacuum, and wash entrances if used by construction personnel with a germicidal cleaner.
11. Elevator: Thoroughly sweep, vacuum, and wash elevator frame, floor, walls and ceiling of elevator cab without damaging finishes.
12. Other:
- a. Overhead items, such as louvers, grilles, pipes, molding, etc., shall be dusted, vacuumed and wiped clean.
 - b. Metal surfaces such as hardware, frames, cover plates, stainless steel sinks, corner guards, etc., shall be cleaned with a damp cloth and polished where required.
 - c. Furniture and equipment shall be wiped clean using special care, be responsible for damage to this equipment. Where the workers see a piece of equipment too delicate or have doubt regarding how to proceed, they will request further instructions from the Owner's Representative.
13. Trash Removal:
- a. Collect and remove all refuse, debris, rubbish and trash throughout the entire area of work. Unless otherwise directed by the Owner's Representative all collected matter shall be deposited in dumpsters of sanitation trucks provided by the Contractor, and removed from the site.

END OF SECTION 01 7423

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**SECTION 01 7700
CONTRACT CLOSEOUT REQUIREMENTS**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the Contract, including General and Supplementary Conditions, apply to this Specification.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for contract closeout.
- B. Related Section: Section 01 7423 – Pre-Occupancy Cleaning.

1.3 EQUIPMENT AND SYSTEMS: START-UP, TESTING, DEMONSTRATION AND TRAINING PROCEDURES

- A. Operation and Maintenance Manuals:
 - 1. Prepare and submit operation and maintenance manuals for equipment and systems installed on the Project. Submit to the Architect for review and response.
 - 2. Operation and maintenance manuals shall contain the following information:
 - a. General operating instructions, including procedures for start-up, shut-down, and systems analysis, and trouble-shooting guidelines.
 - b. Inspection and maintenance procedures and schedules.
 - c. Emergency instructions.
 - d. Names, addresses, and telephone numbers of the following, as applicable:
 - 1) Equipment, System, or Product Manufacturer.
 - 2) Local company representative.
 - 3) Local authorized service representatives.
 - 4) Local authorized dealer of maintenance materials and spare parts.
 - e. Spare parts list.
 - f. Copies of warranties, guarantees, maintenance and service agreements.
 - g. Wiring diagrams.
 - h. Shop Drawings and Product Data.
- B. Demonstration and Training: The Contractor shall schedule demonstration and training of equipment and systems for the benefit of the Owner's personnel. Coordinate sessions with the Owner.
- C. Start-up and testing and demonstration / training activities shall be performed by trained personnel approved by the original equipment manufacturers.
- D. The Contractor shall collect and maintain copies of all testing reports and training certifications. These items shall be included in the Operation and Maintenance Manuals specified elsewhere in this Section.

1.4 INSPECTIONS BY AUTHORITIES HAVING JURISDICTION

- A. The Contractor shall schedule and attend all required inspections required by Authorities Having Jurisdiction over the Project and perform and document all corrections so ordered.
- B. The Contractor shall schedule and attend all re-inspections required by the Authorities Having Jurisdiction and pay all associated fees required to obtain the Certificate of Occupancy.
- C. The Contractor shall submit the Certificate of Occupancy to the Owner as a condition of final acceptance of the Project.

1.5 NOTIFICATION AND ARCHITECT'S PUNCHLIST INSPECTION

- A. The Contractor shall notify the Architect when the Work is substantially complete according to the Contract Documents. Upon receipt of the notice, Architect will schedule and perform a Punch List inspection.

- B. If it is discovered that the Work is not sufficiently complete for the punch list inspection, the Architect will stop the punch list inspection until the Contractor completes the Work and provides assurance that the punch list inspection can resume.
- C. The Architect will submit a Punch List to the Contractor identifying deficient work items that will require correction. The Construction Manager shall complete the items and provide written certification before the Construction Manager's final payment application is certified.

1.6 INSURANCE CHANGEOVER

- A. The Contractor shall submit written understanding between the Owner and the Contractor of pending insurance change over requirements.

1.7 RECORD DOCUMENTS AND WARRANTIES

- A. General: Protect record documents from deterioration and loss in a secure location. Provide access to record documents for the Architect's reference during normal working hours.
- B. Upon completion of the Work, submit record documents to the Architect for the Owner's records. See specification section 01 7839 "Project Record Documents."
- C. Warranties:
 - 1. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications, and similar documents.
 - 2. Warranties shall be original documents prepared specifically for the Project by an authorized agent of the Warrantor and signed by both the Warrantor and the Contractor.

1.8 EXTRA MATERIALS, SPARE PARTS, AND KEYS

- A. Deliver tools, spare parts, extra stock, and similar items to the Owner's authorized representative. Obtain signed receipts for each item.
- B. Arrange for keys to be delivered directly to the Owner's authorized representative. Obtain signed confirmation of delivery.

1.9 DE-MOBILIZATION AND CLEANING

- A. Re-furbish permanent construction used for construction purposes.
 - 1. Change filters, belts, and other consumable components of permanent equipment and systems used during construction.
 - 2. Re-lamp and clean light fixtures used during construction period.
- B. Discontinue and remove temporary facilities and protections from the site.
- C. Remove mock-ups, construction tools, equipment and similar elements.
- D. General: The General Conditions require general cleaning during construction. Regular site cleaning is included in Section 01 5000 - Temporary Facilities and Controls.
- E. Cleaning: Perform Pre-Occupancy Cleaning according to Section 01 7423.
- F. Removal of Protection: Remove temporary protections and facilities installed for protection of the Work during construction.

1.10 FINAL PAYMENT PROCEDURES

- A. Complete the following prerequisites for final payment:
 - 1. Submit final Application for Payment with the following attachments executed:
 - a. Contractor's Affidavit of Payment of Debts and Claims.
 - b. Contractor's Affidavit of Release of Liens
 - c. Waivers of Lien from all Subcontractors, Suppliers, and Materialmen.
 - d. Consent of Surety Company to Final Payment (if performance and payment bond is required.)
 - e. Special Owner requirements related to payroll records, insurance, and other items.
 - 2. Submit an updated final statement, accounting for final adjustments to the Contract Sum.

3. Submit certification that all items on the Architect's punch list have been completed in accordance with the Contract or otherwise resolved for acceptance.
4. Submit a certificate of continuing insurance coverage complying with insurance requirements.

PART 2 - PRODUCTS (Not Applicable)

PART 3 – EXECUTION (Not Applicable)

END OF SECTION 01 7700

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**SECTION 01 7800
CLOSEOUT SUBMITTALS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Project Record Documents.
- B. Operation and Maintenance Data.
- C. Warranties and bonds.

1.2 RELATED REQUIREMENTS

- A. Section 01 3000 - Administrative Requirements: Submittal procedures, shop drawings, product data, and samples.
- B. Section 01 7700 - Contract Closeout Requirements.
- C. Individual Product Sections: Specific requirements for operation and maintenance data.
- D. Individual Product Sections: Warranties required for specific products or Work.

1.3 SUBMITTALS

- A. Project Record Documents: Submit documents to Architect with claim for final Application for Payment.
- B. Operation and Maintenance Data:
 - 1. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Architect will review draft and return one copy with comments.
 - 2. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit completed documents within ten days after acceptance.
 - 3. Submit one copy of completed documents 15 days prior to final inspection. This copy will be reviewed and returned after final inspection, with Architect comments. Revise content of all document sets as required prior to final submission.
 - 4. Submit two sets of revised final documents in final form within 10 days after final inspection.
- C. Warranties and Bonds:
 - 1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within 10 days after acceptance.
 - 2. Make other submittals within 10 days after Date of Substantial Completion, prior to final Application for Payment.
 - 3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within 10 days after acceptance, listing the date of acceptance as the beginning of the warranty period.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 PROJECT RECORD DOCUMENTS

- A. Maintain on site one set of the following record documents; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other modifications to the Contract.
 - 5. Reviewed shop drawings, product data, and samples.
 - 6. Manufacturer's instruction for assembly, installation, and adjusting.
- B. Ensure entries are complete and accurate, enabling future reference by Owner.
- C. Store record documents separate from documents used for construction.
- D. Record information concurrent with construction progress.
- E. Specifications: Legibly mark and record at each product section description of actual products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and modifications.

- F. Record Drawings and Shop Drawings: Legibly mark each item to record actual construction including:
 - 1. Field changes of dimension and detail.
 - 2. Details not on original Contract drawings.

3.2 WARRANTIES AND BONDS

- A. Obtain warranties and bonds, executed in duplicate by responsible Subcontractors, suppliers, and manufacturers, within 10 days after completion of the applicable item of work. Except for items put into use with Owner's permission, leave date of beginning of time of warranty until the Date of Substantial completion is determined.
- B. Verify that documents are in proper form, contain full information, and are notarized.
- C. Co-execute submittals when required.
- D. Retain warranties and bonds until time specified for submittal.
- E. Manual: Bind in commercial quality 8-1/2 by 11 inch three D side ring binders with durable plastic covers.
- F. Cover: Identify each binder with typed or printed title WARRANTIES AND BONDS, with title of Project; name, address and telephone number of Contractor and equipment supplier; and name of responsible company principal.
- G. Table of Contents: Neatly typed, in the sequence of the Table of Contents of the Project Manual, with each item identified with the number and title of the specification section in which specified, and the name of product or work item.
- H. Separate each warranty or bond with index tab sheets keyed to the Table of Contents listing. Provide full information, using separate typed sheets as necessary. List Subcontractor, supplier, and manufacturer, with name, address, and telephone number of responsible principal.

END OF SECTION

**SECTION 01 7823
OPERATION AND MAINTENANCE DATA**

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 preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 3000 "Administrative Requirements" for submitting copies of submittals for operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

1.4 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Architect will comment on whether content of operation and maintenance submittals is acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in one of the following format:
 - 1. Submit on digital media acceptable to Architect. Enable reviewer comments on draft submittals.
 - 2. Submit three paper copies. Architect will return two copies.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of Architect's comments and prior to commencing demonstration and training.
- E. Comply with Section 01 7700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.5 FORMAT OF OPERATION AND MAINTENANCE MANUALS

- A. Manuals, Electronic Files: Submit manuals in the form of a multiple file composite electronic PDF file for each manual type required.
 - 1. Electronic Files: Use electronic files prepared by manufacturer where available. Where scanning of paper documents is required, configure scanned file for minimum readable file size.

2. File Names and Bookmarks: Bookmark individual documents based on file names. Name document files to correspond to system, subsystem, and equipment names used in manual directory and table of contents. Group documents for each system and subsystem into individual composite bookmarked files, then create composite manual, so that resulting bookmarks reflect the system, subsystem, and equipment names in a readily navigated file tree. Configure electronic manual to display bookmark panel on opening file.
- B. Manuals, Paper Copy: Submit manuals in the form of hard-copy, bound and labeled volumes.
1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
 - b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title, name, and subject matter of contents, and indicate Specification Section number on bottom of spine. Indicate volume number for multiple-volume sets.
 2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment. Enclose title pages and directories in clear plastic sleeves.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.6 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Construction Manager.
 7. Name and contact information for Architect.
 8. Name and contact information for Commissioning Authority.
 9. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 10. Cross-reference to related systems in other operation and maintenance manuals.

- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.7 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals. List items and their location to facilitate ready access to desired information. Include the following:
 - 1. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.
 - 2. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
 - 3. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.

1.8 EMERGENCY MANUALS

- A. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- B. Content: Organize manual into a separate section for each of the following:
 - 1. Type of emergency.
 - 2. Emergency instructions.
 - 3. Emergency procedures.
- C. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 - 1. Fire.
 - 2. Flood.
 - 3. Gas leak.
 - 4. Water leak.
 - 5. Power failure.
 - 6. Water outage.
 - 7. System, subsystem, or equipment failure.
 - 8. Chemical release or spill.
- D. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
- E. Emergency Procedures: Include the following, as applicable:
 - 1. Instructions on stopping.
 - 2. Shutdown instructions for each type of emergency.
 - 3. Operating instructions for conditions outside normal operating limits.
 - 4. Required sequences for electric or electronic systems.
 - 5. Special operating instructions and procedures.

1.9 SYSTEMS AND EQUIPMENT OPERATION MANUALS

- A. Systems and Equipment Operation Manual: Assemble a complete set of data indicating operation of each system, subsystem, and piece of equipment not part of a system. Include information required for daily operation and management, operating standards, and routine and special operating procedures.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
 - 1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 - 2. Performance and design criteria if Contractor has delegated design responsibility.
 - 3. Operating standards.
 - 4. Operating procedures.
 - 5. Operating logs.
 - 6. Wiring diagrams.
 - 7. Control diagrams.
 - 8. Piped system diagrams.
 - 9. Precautions against improper use.
 - 10. License requirements including inspection and renewal dates.
- C. Descriptions: Include the following:
 - 1. Product name and model number. Use designations for products indicated on Contract Documents.
 - 2. Manufacturer's name.
 - 3. Equipment identification with serial number of each component.
 - 4. Equipment function.
 - 5. Operating characteristics.
 - 6. Limiting conditions.
 - 7. Performance curves.
 - 8. Engineering data and tests.
 - 9. Complete nomenclature and number of replacement parts.
- D. Operating Procedures: Include the following, as applicable:
 - 1. Startup procedures.
 - 2. Equipment or system break-in procedures.
 - 3. Routine and normal operating instructions.
 - 4. Regulation and control procedures.
 - 5. Instructions on stopping.
 - 6. Normal shutdown instructions.
 - 7. Seasonal and weekend operating instructions.
 - 8. Required sequences for electric or electronic systems.
 - 9. Special operating instructions and procedures.
- E. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.10 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.
- J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
1. Do not use original project record documents as part of maintenance manuals.

1.11 PRODUCT MAINTENANCE MANUALS

- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 7823

**SECTION 01 7839
PROJECT RECORD DOCUMENTS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for project record documents, including the following:
 - 1. Record Drawings and Specifications.
 - 2. Record Product Data and Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Section 01 7700 "Contract Closeout Requirements" for general closeout procedures.
 - 2. Section 01 7823 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit one set(s) of marked-up record prints.
 - 2. Number of Copies: Submit copies of record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit one paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and one of file prints.
 - 3) Submit record digital data files and one set of plots.
 - 4) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit three paper-copy set(s) of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints and three set(s) of prints.
 - 3) Print each drawing, whether or not changes and additional information were recorded.
 - c. Final Submittal:
 - 1) Submit one paper-copy set of marked-up record prints.
 - 2) Submit record digital data files and three sets of record digital data file plots.
 - 3) Plot each drawing file, whether or not changes and additional information were recorded.
- B. Record Specifications: Submit one paper copy or annotated PDF electronic files of Project's Specifications, including addenda and contract modifications.
- C. Record Product Data: Submit one paper copy annotated PDF electronic files and directories] of each submittal.
 - 1. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
- D. Miscellaneous Record Submittals: See other Specification Sections for miscellaneous record-keeping requirements and submittals in connection with various construction activities. Submit one paper copy or annotated PDF electronic files and directories of each submittal.
- E. Reports: Submit written report weekly indicating items incorporated into project record documents concurrent with progress of the Work, including revisions, concealed conditions, field changes, product selections, and other notations incorporated.

1.4 RECORD DRAWINGS

- A. Record Prints: Maintain one set of marked-up paper copies of the Contract Drawings and Shop Drawings, incorporating new and revised drawings as modifications are issued.

1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
 4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: Same digital data software program, version, and operating system as the original Contract Drawings.
 2. Format: DWG, AutoCAD Version 2015 operating system.
 3. Format: Annotated PDF electronic file with comment function enabled.
 4. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 5. Refer instances of uncertainty to Architect for resolution.
 6. Architect will furnish Contractor with one set of digital data files of the Contract Drawings for use in recording information.
 - a. See Section 013100 "Project Management and Coordination" for requirements related to use of Architect's digital data files.
 - b. Architect will provide data file layer information. Record markups in separate layers.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file with comment function enabled.

3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Mark copy with the proprietary name and model number of products, materials, and equipment furnished, including substitutions and product options selected.
 3. Record the name of manufacturer, supplier, Installer, and other information necessary to provide a record of selections made.
 4. For each principal product, indicate whether record Product Data has been submitted in operation and maintenance manuals instead of submitted as record Product Data.
 5. Note related Change Orders, record Product Data, and record Drawings where applicable.
- B. Format: Submit record Specifications as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Specifications.

1.6 RECORD PRODUCT DATA

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
 1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, **record Specifications**, and record Drawings where applicable.
- C. Format: Submit record Product Data as annotated PDF electronic file or scanned PDF electronic file(s) of marked-up paper copy of Product Data.
 1. Include record Product Data directory organized by Specification Section number and title, electronically linked to each item of record Product Data.

1.7 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.
- B. Format: Submit miscellaneous record submittals as PDF electronic file or scanned PDF electronic file(s) of marked-up miscellaneous record submittals.
 1. Include miscellaneous record submittals directory organized by Specification Section number and title, electronically linked to each item of miscellaneous record submittals.

1.8 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store record documents in the field office apart from the Contract Documents used for construction. Do not use project record documents for

construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS

PART 3 - EXECUTION

END OF SECTION 01 7839

**SECTION 02 2623
ASBESTOS ABATEMENT**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Prequalification requirements for asbestos abatement personnel.
- B. Abatement of:
 - 1. ACM as identified and recommended by RoofTEC's Asbestos Sampling Report of Findings, dated March 11, 2022.
- C. Documentation of removal and disposal of the asbestos-containing waste materials described above.

1.2 RELATED SECTIONS

- A. Section 00 3100 – Investigations and Reports
- B. Section 07 0501 – Preparation for Re-Roofing

1.3 DEFINITIONS AND ACRONYMS

- A. Abatement: Removal of asbestos-containing building material.
- B. Asbestos: Any of the following naturally occurring serpentine or amphibole minerals that display an asbestiform habit, including: Chrysotile, Amosite, Crocidolite, and fibrous Tremolite, as defined in CFR 1926.1001.
- C. ACM: (Asbestos containing material) Materials which contain >1% asbestos as determined by bulk sample analysis using stereo and polarized light microscopy as defined in 29 CFR 1926.1001.
 - 1. Category I ACM consists of asbestos-containing gaskets, resilient floor coverings (including vinyl asbestos tile and linoleum), and asphalt roofing products that contain greater than one percent asbestos using the method described in appendix A, subpart F, 40 CFR Part 763, section 1, Polarized Light Microscopy.
 - 2. ACWM: Asbestos-containing waste material.
 - 3. RACM: Regulated asbestos-containing material: Non-Friable Category I ACM that is subjected to forces or removal methods that would crush, crumble, pulverize, or reduce the Category I ACM to a powder by sanding, cutting, grinding, or abrading, including the use of mechanical chippers.
- D. Friable: Capable of being crushed by hand pressure.
- F. NIOSH: National Institutes for Occupational Safety and Health
- G. OSHA: Occupational Safety and Health Administration
- H. EPA: Environmental Protection Agency
- I. HEPA: High Efficiency Particulate Air, filters 99.97% of particulate from air down to 0.03 microns.

1.4 INFORMATIONAL SUBMITTALS

- A. Current copies of all training records, notifications, licenses, insurance certificates, employee certifications, respiratory protection fit-test records, and a copy of the Physician's approval for wearing respiratory protection prior to the start of work.
 - 1. Personnel with expired records will not be permitted on the worksite.
- B. Entry logs, personnel certification, disposal records, and testing information to the Architect for information. Contractor must also supply a copy of the landfill and other disposal information to the Architect.

1.5 QUALITY ASSURANCE

- A. Qualifications:
 - 1. All asbestos abatement work must be conducted by an Ohio State Certified Contractor and shall be performed in accordance with these specifications, EPA regulations, OSHA regulations, NIOSH recommendations, Chapter 3701-34 of the Ohio Administrative Code, and any other applicable federal, state and local government regulations. Whenever there is a conflict or overlap of the above

- references, the most stringent provisions shall apply.
 - 2. All abatement workers shall provide documentation including required certifications, experience, licensing, education and any other qualification that falls under the regulations described above.
 - 3. The Contractor must not have had any recorded EPA, ODOH, Ohio EPA, or other than *de minimis* OSHA violations within the past 5 years.
- B. Pre-Abatement Meeting: A mandatory pre-abatement meeting shall be held and attended prior to the initiation of asbestos abatement and other abatement activities. The Contractor is responsible for presenting the following at the meeting:
 - 1. Abatement Plans: Include drawings of the disposal provisions and their locations.
 - 2. Emergency response or action plan.

1.6 PROJECT CONDITIONS

- A. The Owner assumes no responsibility for the actual condition of the building or materials therein.
- B. Suspected Additional Asbestos Materials: If additional materials suspected of containing asbestos are encountered, document the extent and condition and notify the Architect immediately.

PART 2 – PRODUCTS (NOT APPLICABLE TO THIS PROJECT)

PART 3 - EXECUTION

3.1 NOTIFICATION

- A. Make proper notifications to regulatory agencies.
 - 1. Submit copies of notifications to the Architect and Owner.

3.2 EXAMINATION

- A. Conduct a pre-abatement inspection of the site and prepare a written asbestos abatement plan to be submitted to the Architect.
- B. Continue to evaluate building components as Work progresses to detect hazards resulting from asbestos abatement activities.

3.3 PREPARATION

- A. General: Conduct abatement activities to ensure minimum interference with roads, sidewalks, and other adjacent facilities.
- B: Conduct abatement activities in a manner consistent with good practice and professional standards, as well as compliant with applicable regulations governing the removal of asbestos in the jurisdiction of the Project.

3.4 ASBESTOS ABATEMENT

- A. Asbestos-containing roofing materials must be removed, handled and disposed of in a manner that maintains the materials in a non-friable condition.
- B. Implement appropriate wet removal methods in a manner compliant with Federal, State and local regulations.
 - 1. No dry material will be permitted to be removed or disposed under this contract. Visible emissions of asbestos dust or debris shall not be permitted and all appropriate measures shall be undertaken to assure that these conditions will not exist.
 - 2. Control water used in wet methods so as not to penetrate and damage the building.
- C. Remove all ACM from the roof area. Use methods required to complete Work within limitations of governing regulations.
 - 1. Conduct operations in an efficient manner consistent with good work practices using properly certified and licensed workers utilizing an appropriate level of respiratory protection as required by Federal, State and local regulations, subject to the following minimum conditions:

- C. Remove asbestos-containing caulking with wet methods, HEPA vacuum equipment with HEPA-filtered exhaust.

3.5 PACKAGING AND TRANSPORT OF ASBESTOS-CONTAINING WASTE MATERIAL

- A. All asbestos-containing waste material (ACWM) must be adequately wetted, packaged in leak-tight containers, and appropriately labeled with asbestos warning signs and waste generator labels.
 - 1. Package materials with sharp edges in a manner that prevents any further breakage of the ACWM or puncturing or tearing of the containers.
 - 2. Affix warning signs identifying the contents as Class 9 hazardous material on the vehicle or dumpster during the loading and unloading of ACWM in accordance with 40CFR 61.150(c).

3.4 DISPOSAL

- A. Storage of removed materials on-site will not be permitted.
- B. Remove and transport asbestos and other debris to a central location for waste loadout in a manner that will prevent spillage on other materials or building elements and in a manner consistent with regulations applicable to transport of ACM.
- C. Promptly dispose of demolition debris. All ACWM must be disposed of at a site approved by the U.S. Environmental Protection Agency which is operated in accordance with 40 CFR § 61.154.
- D. Do not allow demolished materials to accumulate onsite. No burning will be permitted on the Project site.

3.5 POST-ABATEMENT DOCUMENTATION

- A. Provide copies of all project documentation, including notifications, records, sign-in sheets, personnel logs, signed release sheets, disposal manifests and any other required documentation.

END OF SECTION

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**SECTION 02 4119
SELECTIVE DEMOLITION**

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 SECTION INCLUDES

- A. Selective site demolition.
- B. Selective interior demolition.
- C. Salvage Requirements:
 - 1. Salvaging and delivering existing construction elements to the Owner.
 - 2. Salvaging existing construction elements for subsequent re-installation.
- D. Demolition Work Under Separate Contract: The Contractor will engage a separate Abatement Contractor for all hazardous material abatement work on this Project. A copy of the hazardous material survey for the Contractor's reference has been included in the specification.
 - 1. Only the designated Abatement Contractor is authorized to cut openings in ceilings, remove floor tile, remove tile mastic and remove white vibration damper.
- E. Related Specifications:
 - 1. Section 01 5000 - Temporary Facilities and Controls

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Salvage: Carefully detach from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.
- C. Remove and Reinstall: Detach items from existing construction, store, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled.

1.4 SUBMITTALS

- A. Existing Conditions Documentation: Refer to Part 3 Existing Conditions article below.
- B. Schedule of Demolition Activities: Provide a written plan for executing demolition procedures. Include the following details:
 - 1. Critical dates (Commencement, interim milestones, completion date).
 - 2. Provisions for maintaining the Owner's continuing use of the facility during selective demolition operations.
 - 3. Service interruptions and corresponding temporary services.
 - 4. Selective demolition procedures according to each designated building area.
 - 5. Weather protection
 - 6. Indoor air quality preservation
- C. Inventory: Submit a list of items to be removed and salvaged for re-use. Distinguish between items to be removed and delivered to the Owner and items to be re-installed in the Project.
- D. Qualification statements for specialists engaged by the Contractor for selective demolition procedures, including but not limited to refrigerant recovery technician and structural engineers responsible for designing shoring and bracing systems.

1.5 REGULATORY REQUIREMENTS

- A. Obtain permits related to the work of this Section required by authorities having jurisdiction.

PART 2 – PRODUCTS (Not Applicable)

PART 3 - EXECUTION

3.1 MATERIALS OWNERSHIP

- A. Demolition waste becomes the Contractor's property, except as follows:

1. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 2. Carefully salvage such items in a manner to prevent damage and deliver to Owner.
- B. Do not use the Owner's premises for storage or sale of demolished materials.

3.2 EXISTING CONDITIONS

- A. Prior to commencing with selective demolition, inspect existing conditions. Identify conditions that might be construed as damage caused by the Contractor during selective demolition procedures. Submit photographic documentation and a written report to the Architect.

3.3 PREPARATION

- A. Comply with EPA notification protocol and applicable requirements of authorities having jurisdiction.
- B. Review active warranties for building components or systems. Take appropriate measures to assure warranties will not be voided by selective demolition procedures.
- C. Install temporary facilities and controls necessary to protect building occupants from exposure to noise, dust, fumes, and other hazards or disruptions during selective demolition procedures. Maintain throughout the construction period or until authorized by the Architect to be removed.
1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in 01 5000 - Temporary Facilities and Controls.
- D. Stabilization: Provide shoring and bracing designed by a qualified structural engineer licensed to practice in the Project jurisdiction to preserve stability and prevent movement, settlement, or collapse of construction to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
1. Strengthen or add new supports when required during progress of selective demolition.
- E. Protect building utility services from interruption, except when approved in writing by the Owner and proper notification has been given.
- F. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
- G. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
- H. Existing Construction to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.
- I. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and subsequently cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.4 SALVAGE

- A. Remove and clean salvage items using methods that preserve their condition.
- B. Pack or crate items after cleaning. Label containers accordingly.
- C. Store items in a secure area until delivery to Owner or re-installation.
- D. Transport items to be retained by the Owner to an acceptable storage area on-site.
- E. Repair and clean items scheduled for re-installation.

3.5 SELECTIVE DEMOLITION

- A. General: Limit selective demolition to the extent required by new construction and as indicated.

1. Proceed with selective demolition systematically, from higher to lower levels. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 2. 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, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
- B. Flame Cutting:
1. Do not use cutting torches until work areas are cleared of flammable materials.
 2. In concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations.
 3. Maintain adequate ventilation when using cutting torches.
 4. Fire Watch: Maintain fire watches and portable fire-suppression devices during flame-cutting operations. Cease flame cutting at least one and one-half hours prior to the end of a work shift and maintain fire watch until the shift is terminated.
- C. Structural Framing: Remove and lower framing members to ground so as to avoid free fall.
- D. Concrete: Demolish in small sections. Using power-driven saw, cut concrete to a depth of at least 3/4 inch at junctures with construction to remain. Dislodge concrete from reinforcement at perimeter of areas being demolished, cut reinforcement, and then remove remainder of concrete. Neatly trim openings to dimensions indicated.
- E. Concrete and Masonry: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saws.
- F. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- G. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."
1. Do not use solvent-based adhesive strippers.

3.6 DISPOSAL

- A. Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
- B. Do not allow demolished materials to accumulate on-site.
- C. Burning: Not permitted.

3.7 ENDING PROCEDURES

- A. Reinstall salvaged and protected items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
- B. 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 02 4119

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**SECTION 03 9000
CONCRETE DECK REPAIR**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Patching of existing cast, or pre-cast concrete roof deck as necessary for re-roofing procedures following roofing demolition to roof deck.
- B. Pricing and Payment Procedures: The work of this section will be paid for under the terms of a quantity allowance as follows.
 - 1. Quantity Allowance: In the space provided on the Bid Form, the Bidder shall quote the cost for patching one hundred (100) square feet of existing concrete roof deck at a depth of 4 inches. The cost shall be net installed cost. This cost shall be included in the total Base Bid Sum.
 - 2. Unit Price Adjustment: In the space provided on the Bid Form the Bidder shall quote the cost per square foot for increasing or decreasing the allowed quantity. The Contractor shall report to the Architect and Owner the actual quantity of roof deck patching required to complete the Project and the Contract Sum will be adjusted by Change Order using the quoted Unit Price.

1.2 SUBMITTALS

- A. Manufacturer's product data for the concrete patching product to be used.
- B. Final statement of quantity used.

PART 2- PRODUCTS

2.1 MANUFACTURERS

- A. Mapei (Basis of Design)
- B. Conproco Corporation
- C. Euclid Chemical Company
- D. Sika

2.2 PRODUCTS, GENERAL

- A. Manufacturer's product designations listed in subsequent articles are to establish a baseline quality standard for the Project. Equivalent-performing products properly submitted will be evaluated by the Architect. Refer to Division 00 and 01 requirements for submittal procedures.

2.3 CONCRETE REPAIR MORTAR

- A. Polymer modified Portland cement and aggregate with admixture and migrating corrosion inhibitors.
 - 1. Application: Horizontal surfaces 1 inch or greater.
 - 2. Basis of Design Product: Mapecem Quickpatch.

2.4 BONDING AGENTS

- A. Epoxy bonding agent and anti-corrosion coating.
 - 1. Application: For bonding repair mortar to existing concrete.
 - 2. Mapei Planibond EBA.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine all areas and conditions under which work of this section will be performed. Correct conditions detrimental to the proper and timely completion of the work. Do not proceed until unsatisfactory conditions have been corrected.

3.2 SURFACE PREPARATION

- A. Prepare concrete surfaces in accordance with manufacturer's instructions.
- B. Remove dirt, dust, oil, grease, debris, paint, curing compounds, sealers, and unsound concrete.
- C. Apply bonding agent to existing concrete.

3.3 INSTALLATION OF REPAIR MORTAR

- A. Place repair mortar according to manufacturer's instructions. Place in lifts not exceeding manufacturer's recommendations.
- B. Trowel flush with surface and allow to stiffen. Finish to match the surrounding concrete and aggregate surfaces.
- C. Cure concrete repair mortar according to the manufacturer's instructions.

3.4 PROTECTION

- A. Protect placed concrete repair mortar from freezing, excessive drying, or construction-related damage until cured according to manufacturer's recommendations.

END OF SECTION

**SECTION 05 0500
BASIC MATERIALS AND METHODS: METALS**

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections, apply to work of this Section.

1.2 SUMMARY

- A. Section includes basic requirements for subsequent Division 05 – Metals Specifications Sections.

1.3 REFERENCES

- A. General: Section 01 4219 – Reference Standards.
- B. American Institute of Steel Construction (AISC)
- C. American Society for Testing and Materials (ASTM).
 1. ASTM A 27 Standard Specification for Steel Castings, Carbon, for General Application.
 2. ASTM A 36 Standard Specification for Carbon Structural Steel.
 3. ASTM A 53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
 4. ASTM A 108 Standard Specification for Steel Bars, Carbon and Alloy, Cold-Finished, Steel.
 5. ASTM A 123 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Products.
 6. ASTM A 143 Standard Specification for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement.
 7. ASTM A 153 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 8. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates.
 9. ASTM A 307 Standard Specification for Carbon Steel Bolts and Studs, 60,000 Tensile Strength.
 10. ASTM A 325 Standard Specification for Structural Bolts, Steel, Heat-Treated, 120/105 Minimum Tensile Strength.
 11. ASTM A 384 Standard Specification for Safeguarding Against Warpage and Distortion During Hot-Dip Galvanizing of Steel Assemblies.
 12. ASTM A 385 Standard Specification for Providing High Quality Zinc Coatings (Hot-Dip).
 13. ASTM A 1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, A 1008M Structural, High-Strength Low-Alloy, High-Strength Low-Alloy Hardenable
 14. ASTM A 490 Standard Specification for Heat-Treated Steel Structural Bolts, Alloy Steel 150 ksi Minimum Tensile Strength.
 15. ASTM A 500 Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.
 16. ASTM A 563 Standard Specification for Carbon and Alloy Steel Nuts.
 17. ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 18. ASTM A 780 Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 19. ASTM A 1008 Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability. Solution Hardened, and Bake Hardenable.
 20. ASTM B 633 Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel.
 21. ASTM D 1056 Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber.
 22. ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Materials.

23. ASTM E 894 Standard Test Method for Anchorage of Permanent Metal Railing Systems and Rails for Buildings.
 24. ASTM E 935 Standard Test Methods for Performance of Permanent Metal Railing Systems and Rails for Buildings.
 25. ASTM E 985 Standard Specification for Permanent Metal Railing Systems and Rails for Buildings.
- D. American Welding Society (AWS).
 1. AWS D1.1 "Structural Welding Code--Steel"
 2. AWS D1.3 "Structural Welding Code--Sheet Steel."
 - E. National Association of Architectural Metal Manufacturer's (NAAMM).
 1. "Metal Finishes Manual for Architectural and Metal Products"
 - F. The Society for Protective Coatings (SSPC).
 1. SSPC-Paint 15 - Steel Joist Shop Primer; Society for Protective Coatings.
 2. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings.
 - G. Underwriters Laboratories (UL).

1.4 SUBMITTALS

- A. General: Section 01 3000 – Administrative Requirements.
- B. Product Data: Submit complete product data for all proprietary items.
- C. Shop Drawings: Details of fabrication and connection of shop-fabricated items.
 1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
 2. Include embedment drawings.
 3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld.
 4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pre-tensioned and slip-critical high-strength bolted connections.
 5. For connections required to comply with design loads, include structural analysis data prepared, signed and sealed by a qualified professional engineer registered in the state in which the project is located.
- D. Samples: Submit samples for items exposed in the finished work.
- E. Qualification Data: Submit pertinent information for the following. Refer to Section 01 4000 - Quality Requirements for content.
 1. Fabricators.
 2. Engineers.
 3. Surveyors.
 4. Installers.
 5. Welders.
- F. Research and Evaluation Reports for the following:
 1. Post-installed concrete anchors
 2. Metal fastenings
 3. Structural metal stud framing
- G. Mill Test Report: Certifying that the following products comply with requirements:
 1. Structural steel including chemical and physical properties.
 2. Bolts, nuts, and washers including mechanical properties and chemical analysis.
 3. Direct-tension indicators.
 4. Tension-control, high-strength bolt-nut-washer assemblies.
 5. Shear stud connectors.
 6. Shop primers.
 7. Non-shrink grout.

1.5 QUALITY ASSURANCE

- A. General: Section 01 4000 – Quality Requirements.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Section 01 6000 – Product Requirements.

2.2 METALS, GENERAL

- A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

2.3 FABRICATION

- A. Accurately form components to suit specific project conditions and for proper connection to building structure.
- B. Fit and shop assemble components in largest practical sizes for delivery to site.
- C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

PART 3 – EXECUTION

3.1 PREPARATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 EXECUTION, METALS

- A. Fabricate metals from materials of size, thickness, and shapes indicated, but not less than that needed to comply with performance requirements indicated. Work to dimensions indicated or accepted on shop drawings, using proven details of fabrication and support.
- B. Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges.
- C. Shear and punch metals cleanly and accurately.
- D. Remove sharp or rough areas on exposed surfaces.
- E. Ease exposed edges to a radius of approximately 1/32 inch (1 mm), unless otherwise indicated. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.
- F. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals. Obtain fusion without undercut or overlap. Remove welding flux immediately. At exposed connections, finish exposed welds and surfaces smooth and blended so that no roughness shows after finishing, and welded surface matches contours of adjoining surfaces.
- G. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of type indicated or, if not indicated, Phillips flat-head (countersunk) screws or bolts. Locate joints where least conspicuous.
- H. Secure fabrications to substrates securely to withstand specified structural performance requirements.

3.3 CLEANING AND RESTORATION

- A. Clean and restore shop-applied finishes in compliance with referenced standards.
- B. Replace components that cannot be restored to the Architect's satisfaction.

END OF SECTION 05 0500

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**SECTION 05 4000
COLD-FORMED METAL FRAMING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Formed steel stud interior wall framing.

1.2 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry: Wood blocking and miscellaneous framing.
- B. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.3 REFERENCE STANDARDS

- A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)
- B. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2005.
- C. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate with work of other sections that is to be installed in or adjacent to the metal framing system, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.5 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide manufacturer's data on factory-made framing connectors, showing compliance with requirements.
- C. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
 - 1. Indicate stud and ceiling joist layout.
 - 2. Describe method for securing studs to tracks and for bolted framing connections.
 - 3. Provide design engineer's stamp on shop drawings.
- D. Manufacturer's Installation Instructions: Indicate special procedures, conditions requiring special attention.

1.6 QUALITY ASSURANCE

- A. Designer Qualifications: Design framing system under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.
- B. Installer Qualifications: Company specializing in performing the work of this section with minimum 2 years of experience.

PART 2 PRODUCTS

2.1 MANUFACTURERS

2.2 FRAMING SYSTEM

- A. Provide primary and secondary framing members, bridging, bracing, plates, gussets, clips, fittings, reinforcement, and fastenings as required to provide a complete framing system.
- B. Design Criteria: Provide completed framing system having the following characteristics:
 - 1. Design: Calculate structural characteristics of cold-formed steel framing members according to AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
 - 2. Structural Performance: Design, engineer, fabricate, and erect to withstand specified design loads for project conditions within required limits.
 - 3. Design Loads: In accordance with applicable codes.

4. Live load deflection meeting the following, unless otherwise indicated:
 - a. Floors: Maximum vertical deflection under live load of 1/480 of span.
 - b. Roofs: Maximum vertical deflection under live load of 1/240 of span.
 - c. Design non-axial loadbearing framing to accommodate not less than 1/2 in vertical deflection.
 5. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
 6. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.
- C. Shop fabricate framing system to the greatest extent possible.
D. Deliver to site in largest practical sections.

2.3 FRAMING MATERIALS

- A. Studs and Track: ASTM C 955; studs formed to channel, "C", or "Sigma" shape with punched web; U-shaped track in matching nominal width and compatible height.
1. Gage and depth: As required to meet specified performance levels.
 2. Galvanized in accordance with ASTM A 653/A 653M G60/Z180 coating.

2.4 ACCESSORIES

- A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.
- B. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I – Inorganic.

2.5 FASTENERS

- A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot dip galvanized per ASTM A 153/A 153M.
- B. Anchorage Devices: Power actuated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.
- B. Verify field measurements and adjust installation as required.

3.2 INSTALLATION OF STUDS

- A. Install components in accordance with manufacturers' instructions and ASTM C 1007 requirements.
- B. Align floor and ceiling tracks; locate to wall layout. Secure in place with fasteners at maximum 24 inches on center. Coordinate installation of sealant with floor and ceiling tracks.
- C. Place studs at 16 inches on center; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using clip and tie method.
- D. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.
- E. Install load bearing studs full length in one piece. Splicing of studs is not permitted.
- F. Install load bearing studs, brace, and reinforce to develop full strength and achieve design requirements.
- G. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.
- H. Install intermediate studs above and below openings to align with wall stud spacing.
- I. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.
- J. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

END OF SECTION

**SECTION 05 5000
METAL FABRICATIONS**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the contract including General, Supplementary and Special Conditions and other Division 01 Specification sections apply to work of this section.

1.2 SECTION INCLUDES

- A. Roof ladder
- B. Grab bars
- C. Louvered equipment screen

1.3 PRICE AND PAYMENT PROCEDURES

- A. Not used.

1.4 REFERENCE STANDARDS

- A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008.
- B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2012.
- C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2013.
- D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2013.
- E. ASTM A325 - Standard Specification for Structural Bolts, Steel, Heat Treated, 120/105 ksi Minimum Tensile Strength; 2010.
- F. ASTM A325M - Standard Specification for Structural Bolts, Steel, Heat Treated 830 MPa Minimum Tensile Strength (Metric); 2013.
- G. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; American Welding Society; 2012.
- H. AWS D1.1/D1.1M - Structural Welding Code - Steel; American Welding Society; 2010 w/Errata.
- I. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic"); Society for Protective Coatings; 2002 (Ed. 2004).

1.5 SUBMITTALS

- A. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
 - 1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
 - 2. If pre-fabricated safety railing systems with clamp-type fittings are provided in lieu of welded railings (at Contractor's option), provide manufacturer's product literature for system components in lieu of shop drawings.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Steel Sections: ASTM A36/A36M.
- B. Plates: ASTM A283.
- C. Bolts, Nuts, and Washers: ASTM A325 (ASTM A325M), Type 1, plain.
- D. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.
- E. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.2 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.

- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.3 FABRICATED ITEMS

- A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; galvanized finish.
 - 1. Side Rails: 3/8 x 2 inches (9 x 50 mm) members spaced at 20 inches (500 mm).
 - 2. Rungs: one inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.
 - 3. Space rungs 7 inches (175 mm) from wall surface, except where wall stand-offs require alternative spacing from wall.

2.4 FINISHES - STEEL

- A. Galvanizing: Galvanize after fabrication to ASTM A123/A123M requirements.

2.5 FABRICATION TOLERANCES

- A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
- B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
- C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
- D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
- E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.

3.2 PREPARATION

- A. Clean and strip primed steel items to bare metal where site welding is required.
- B. Supply setting templates to the appropriate entities for steel items required to be embedded in masonry.

3.3 INSTALLATION

- A. Install items plumb and level, accurately fitted, free from distortion or defects.
- B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- C. Field weld components indicated.
- D. Perform field welding in accordance with AWS D1.1/D1.1M.
- E. Obtain approval prior to site cutting or making adjustments not scheduled.
- F. After erection, prime welds, abrasions, and surfaces not shop primed.

3.4 TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch (6 mm).
- C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 06 0500

BASIC MATERIALS AND METHODS: WOOD, PLASTIC, & COMPOSITES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including Division 1 – Specification sections apply to work of this section.

1.2 SECTION INCLUDES

- A. General product and work results requirements for subsequent Division 06 Sections.

1.3 SUBMITTALS

- A. Manufacturer's color charts showing the full range of colors, textures, and patterns available for each type of material indicated.
- B. Shop Drawings: Show profiles, thicknesses, finishes, joints, ornamentation, installation tolerances, and anchorage details. Indicate attachment methods, embedded supports, reinforcement, fabrication methods, joint treatments, clearances, and supports.

1.4 QUALITY ASSURANCE

- A. Lumber Standards: Comply with DOC PS 20, "American Softwood Lumber Standard," and with applicable grading rules of inspection agencies certified by ALSC's Board of Review.
- B. Inspection Agencies: Inspection agencies, and the abbreviations used to reference them, include the following:
 - 1. Northeastern Lumber Manufacturers Association (NeLMA)
 - 2. National Lumber Grades Authority (NLGA)
 - 3. Southern Pine Inspection Bureau (SPIB)
- C. Grade Stamps: Provide lumber with each piece factory marked with grade stamp of inspection agency evidencing compliance with grading rule requirements and identifying grading agency, grade, species, moisture content at time of surfacing, and mill.
- D. 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.
 - 1. Provide dressed lumber, S4S, unless otherwise indicated.
 - 2. Provide dry lumber with 19 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.
 - 3. Provide lumber with 15 percent maximum moisture content at time of dressing for 2-inch nominal thickness or less, unless otherwise indicated.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Environmental Requirements: Do not deliver materials or commence installation until the building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

1.6 PROJECT CONDITIONS

- A. Coordinate sizes and locations of framing, blocking, furring, reinforcements, and other related units of Work specified in other Sections to ensure that interior architectural work can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Refer to subsequent Division 06 Sections for specific material requirements.
- B. Do not use materials with defects that impair quality of rough carpentry or pieces that are too small to use with minimum number of joints or optimum joint arrangement.

2.2 PERFORMANCE REQUIREMENTS – (Not Applicable)

2.3 MISCELLANEOUS MATERIALS

- A. Fasteners and Anchors: Provide nails, screws, and other anchoring devices of the type, size, material, and finish required for application indicated to provide secure attachment, concealed where possible, and complying with applicable Federal Specifications. Provide in sufficient length to penetrate minimum of 1-1/2 inches into substrate, unless otherwise recommended by manufacturer.
 - 1. 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.

2.4 FABRICATION

- A. Wood Moisture Content: Comply with requirements of specified inspection agencies and manufacturer's recommendations for moisture content of carpentry on relative humidity conditions existing during time of fabrication and in installation areas.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerance and other conditions affecting installation and performance of work. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Do not install materials damaged by water or mold.

3.2 PREPARATION

- A. Clean substrates of projections and substances detrimental to application.
- B. Condition wood to average prevailing humidity conditions in installation areas before installation, for a minimum of 48 hours unless longer conditioning is recommended by manufacturer.
- C. Ensure that all electrical or other services are in place.

3.3 INSTALLATION

- A. Discard units of material which are unsound, warped, bowed, twisted improperly treated, not adequately seasoned or too small to fabricate work with minimum of joints or optimum jointing arrangements. Do not use manufactured units with defective surfaces, sizes, or patterns.
- B. Install the work plumb, level, true, and straight with no distortions. Shim as required using concealed shims. Install to a tolerance of 1/8" in 10'-0" for plumb and level countertops; and with 1/16" maximum offset in flush adjoining 1/16" maximum offsets in revealed adjoining surfaces.
- C. Scribe and cut work to fit adjoining work, and refinish cut surface or repair damaged finish at cuts.
- D. Finish according to specified requirements.
- E. Anchor carpentry as indicated. Secure to grounds, stripping and blocking with countersunk, concealed fasteners and blind nailing as required for a complete installation. Except where prefinished matching fastener heads are required, use fine finishing nails for exposed nailings, countersunk and filled flush with finished surface, and matching final finish where transparent is indicated.

3.4 ADJUSTMENT, CLEANING, FINISHING, AND PROTECTION

- A. Repair damaged and defective carpentry work wherever possible to eliminate visual and functional defects. Replace woodwork that cannot be repaired to the Owner's satisfaction. Adjust joinery for uniform appearance.
- B. Clean work on exposed and semi-exposed surfaces.
- C. Refer to Division 09 Sections for final finishing requirements.

- D. Provide final protection and maintain conditions necessary to ensure that work will be without damage or deterioration at time of acceptance.

END OF SECTION 06 0500

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**SECTION 06 1000
ROUGH CARPENTRY**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract including Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. Concealed wood blocking, nailers, and supports

1.3 SUBMITTALS

- A. 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.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS

- A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
 - 1. Species: Spruce-Pine-Fir (South), unless otherwise indicated.
 - 2. Lumber of other species or grades is acceptable provided structural and appearance characteristics are equivalent to or better than products specified.

2.2 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

- A. Grading Agency: Southern Pine Inspection Bureau, Inc. (SPIB).
- B. Sizes: Nominal sizes as indicated on drawings, S4S.
- C. Moisture Content: S-dry or MC19.
- D. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
 - 1. Lumber: S4S, No. 2 or Standard Grade.
 - 2. Boards: Standard or No. 3.

2.3 CONSTRUCTION PANELS

- A. Communications, Fire, and Electrical Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84

2.4 ACCESSORIES

- A. Fasteners and Anchors:
 - 1. Drywall Screws: Bugle head, hardened steel, power driven type, length three times thickness of sheathing.
 - 2. Anchors: Expansion shield and lag bolt type for anchorage to solid masonry or concrete.
 - 3. Concrete anchors at roof shall be a one-piece, pre-expanded 1/4 inch diameter, flat head anchor, corrosion protected with zinc with yellow dichromate and shall be made of high grade tempered steel having a shear strength greater than grade 8 steel and have a tensile strength of not less than 2,050 lbs. Fasteners shall meet FM 4470.
 - 4. Concrete screw fastener shall have a minimum 0.190 shank diameter and thread diameter of 0.245 with 10 threads per inch. Fastener shall be coated with CR-10 or equivalent and shall meet FM 4470.
 - 5. Felt separator sheet shall be No. 30 # non-perforated asphalt saturated felts conforming to the requirements of ASTM D-226 Type I, cut to fit under wood blocking to prevent contact with concrete or masonry surfaces. Lap minimum of 3".
 - 6. Protection Pad - Provide a protection pad membrane under all blocking attached to the rooftop curbs that rest on the roof surface. Protection Pad shall be membrane from the installing manufacturer's system. Protection Pad shall be continuous and extend past all edges of blocking by a minimum of 3".

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for installation tolerance and other conditions affecting installation and performance of finish carpentry. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Do not install materials damaged by water or mold.

3.2 PREPARATION

- A. See specification section 06 0500.

3.3 INSTALLATION

- A. See specification section 06 0500.

3.4 BLOCKING, NAILERS, AND SUPPORTS

- A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.
- B. In metal stud walls, provide continuous blocking for millwork, securely attached to stud framing.
- C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.
- D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.
- E. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 - 1. NES NER-272 for power-driven fasteners.
 - 2. Ohio Building Code, Table 2304.9.1, "Fastening Schedule."
- F. Items requiring non-structural framing and blocking include but are not limited to:
 - 1. Cabinets and shelf supports.
 - 2. Wall brackets for support of countertops.
 - 3. Toilet room grab bars.
 - 4. Wall-mounted door stops.
- G. Exterior top-of-parapet blocking: separate wood from concrete with a felt separator (30# asphalt felt). Attach per requirements of roofing manufacturer's wind warranty.

3.5 TOLERANCES

- A. Framing Members: 1/16 inch from true position, maximum.
- B. Variation from Plane: 1/16 inch in 10 feet maximum, and 1/8 inch in 30 feet maximum.

END OF SECTION 06 1000

**SECTION 07 0501
PREPARATION FOR RE-ROOFING**

PART 1 - GENERAL

1.1 SUMMARY

- A. Remove existing roofing assembly base flashings, metal counterflashing, insulating materials, metal fasteners and miscellaneous items down to the existing roof deck. Refer to 00 3100 Investigations and Reports for asbestos abatement.

1.2 PRE-INSTALLATION CONFERENCE

- A. Refer to Division 07 Sections.
- B. Review installation procedures and coordination required with related work.

1.3 ENVIRONMENTAL CONDITIONS

- A. Do not remove existing roofing system, through-roof penetrations, or deteriorated decking when weather conditions threaten the integrity of the building contents or occupants. Maintain temporary protection prior to installation of the new roofing system and other components.

1.4 PROTECTION

- A. Respond immediately to correction of roof leaks or thermal migration during construction. A six (6) hour time limit shall be given from the time of notification of emergency conditions.
- B. In the event of water penetration during rain or a storm, the Contractor shall provide for repair or protection of the building contents and interior. If the Contractor does not respond or cannot be contacted, the Owner will effect repairs or emergency action and the Contractor shall be back charged for all expenses and damages, if any.

1.5 SCHEDULE

- A. Schedule work to coincide with commencement of installation of new roofing system.
- B. Remove only what can be replaced or temporarily protected in a single day or single work shift.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Asphalt Primer: Asphalt based primer as supplied by the roofing system manufacturer.
- B. Temporary Roofing Membrane: Approved manufacturer's torch-applied or self-adhering sheet compatible with specified roofing insulation.

PART 3 - EXECUTION

3.1 EXAMINATION:

- A. Verify existing conditions, including roof dimensions.
- B. Verify that the existing roof surface is clear and ready for work of the section.

3.2 MATERIALS REMOVAL

- A. Remove all roofing, cant strips, expansion joints, base flashings, metal fasteners, and any other items as required to leave a smooth, even surface for new roofing.
- B. Utilize methods for removal of dirt, silt, gravel, debris, roof membrane and insulation from the roof surface that preserve the surrounding environment and protect the building surfaces.
- C. All debris removed from the roof shall be transported from the roof via chutes into dumpsters or trucks and this debris shall be removed from the premises when vehicles are full at the Contractors cost. No debris shall be transported from the area being worked on over a previously finished roof without an overlayment of 3/4" plywood.
 - 1. Take proper measures to assure that demolished insulation does not become airborne and litter adjacent facilities or properties.
 - 2. If necessary, tent dumpsters to prevent the spread of dust and debris
- D. Locate equipment and materials in a manner that does not damage the roof structure.

- E. Damage to the building or surrounding grounds caused by the removal or installation of the roof system will be the sole responsibility of the Contractor.

END OF SECTION

SECTION 07 5323
ETHYLENE-PROPYLENE-DIENE-MONOMER (EPDM) ROOFING

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Adhered ethylene-propylene-diene-terpolymer (EPDM) roofing system.
 - 2. Roof insulation.
 - 3. Cover board.
 - 4. Walkways.

1.2 PREINSTALLATION MEETINGS

Preliminary Conference: Conduct conference at Project site.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. For insulation and roof system component fasteners, include copy of FM Approvals' RoofNav listing.
- B. Shop Drawings: Include roof plans, sections, details, and attachments to other work, including the following:
 - 1. Layout and thickness if insulation.
 - 2. Base flashings and membrane terminations.
 - 3. Flashing details at penetrations.
 - 4. Tapered insulation, thickness, and slopes (for crickets and areas requiring additional slope to achieve 1/8" per foot minimum slope. Majority of roof has sloped concrete deck).
 - 5. Roof plan showing orientation of steel roof deck and orientation of roof membrane and fastening spacings and patterns for mechanically fastened roofing system.
 - 6. Tie-in with air barrier.
- C. Samples: For the following products:
 - 1. Roof membrane and flashings of color required.
 - 2. Walkway pads or rolls, of color required.
- D. Wind Uplift Resistance Submittal: For roofing system, indicating compliance with wind uplift performance requirements.

1.4 INFORMATIONAL SUBMITTALS

- A. Manufacturer Certificates:
 - 1. Performance Requirement Certificate: Signed by roof membrane manufacturer, certifying that roofing system complies with requirements specified in "Performance Requirements" Article.
 - a. Submit evidence of complying with performance requirements.
 - 2. Special Warranty Certificate: Signed by roof membrane manufacturer, certifying that all materials supplied under this Section are acceptable for special warranty.
- B. Product Test Reports: For components of roof membrane and insulation, for tests performed by a qualified testing agency, indicating compliance with specified requirements.
- C. Research reports.
- D. Field Test Reports:
 - 1. Fastener-pullout test results and manufacturer's revised requirements for fastener patterns.
- E. Field quality-control reports.
- F. Sample warranties.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance data.
- B. Certified statement from existing roof membrane manufacturer stating that existing roof warranty has not been affected by Work performed under this Section.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer that is listed in FM Approvals' RoofNav for roofing system identical to that used for this Project, or minimum 10 years experience with roofing system.
- B. Installer Qualifications: A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive manufacturer's special warranty.

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of roofing system that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Period: **20** years from Date of Substantial Completion.
 - 2. Warranty shall be no dollar limit with a 115 mph wind speed warranty for material and labor, inclusive of all roof system components, flashings, perimeter edge metals, etc.
 - 3. Warranty shall be presented to the Owners upon completion of the EPDM roof system installation.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accelerated Weathering: Roof membrane shall withstand 2000 hours of exposure when tested according to ASTM G 152, ASTM G 154, or ASTM G 155.
- B. Impact Resistance: Roof membrane shall resist impact damage when tested according to ASTM D 3746, ASTM D 4272, or the Resistance to Foot Traffic Test in FM Approvals 4470.
- C. Wind Uplift Resistance: Design roofing system to resist wind uplift pressures when tested according to FM Approvals 4474, UL 580, or UL 1897,
- D. FM Approvals' RoofNav Listing: Roof membrane, base flashings, and component materials shall comply with requirements in FM Approvals 4450 or FM Approvals 4470 as part of a roofing system, and shall be listed in FM Approvals' RoofNav for Class 1 or noncombustible construction, as applicable. Identify materials with FM Approvals Certification markings.
 - 1. Fire/Windstorm Classification: Class 1A-90
 - 2. Hail-Resistance Rating: MH.
- E. Exterior Fire-Test Exposure: ASTM E 108 or UL 790, Class A for application and roof slopes indicated; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
- F. Fire-Resistance Ratings: Comply with fire-resistance-rated assembly designs indicated. Identify products with appropriate markings of applicable testing agency.
- G. **ACCEPTABLE MANUFACTURERS:**
 - 1. Firestone Building Products
 - 2. Carlisle Syntec Inc.
 - 3. Johns Manville
 - 4. Approved Equal

2.2 ETHYLENE-PROPYLENE-DIENE-TERPOLYMER (EPDM) ROOFING

- A. EPDM Sheet: ASTM D 4637/D 4637M, Type II, scrim or fabric internally reinforced, EPDM sheet with factory-applied seam tape.
 - 1. Thickness: 60 mils (1.5 mm) nominal.
 - 2. Exposed Face Color: Black

2.3 AUXILIARY ROOFING MATERIALS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with other roofing components.
 - 1. Adhesive and Sealants: Comply with VOC limits of authorities having jurisdiction.
- B. Sheet Flashing: 60-mil- (1.5-mm-) thick EPDM, partially cured or cured, according to application.

- C. Protection Sheet: Epichlorohydrin or neoprene nonreinforced flexible sheet, 55 to 60 mils (1.4 to 1.5 mm) thick, recommended by EPDM manufacturer for resistance to hydrocarbons, non-aromatic solvents, grease, and oil.
- D. Slip Sheet: ASTM D 2178/D 2178M, Type IV; glass fiber; asphalt-impregnated felt.
- E. Slip Sheet: Manufacturer's standard, of thickness required for application.
- F. Prefabricated Pipe Flashings: As recommended by roof membrane manufacturer.
- G. Bonding Adhesive: Manufacturer's standard.
- H. Modified Asphaltic Fabric-Backed Membrane Adhesive: Roofing system manufacturer's standard modified asphalt, asbestos-free, cold-applied adhesive formulated for compatibility and use with fabric-backed membrane roofing.
- I. Water-Based, Fabric-Backed Membrane Adhesive: Roofing system manufacturer's standard water-based, cold-applied adhesive formulated for compatibility and use with fabric-backed membrane roofing.
- J. Low-Rise, Urethane, Fabric-Backed Membrane Adhesive: Roof system manufacturer's standard spray-applied, low-rise, two-component urethane adhesive formulated for compatibility and use with fabric-backed membrane roofing.
- K. Seaming Material: Factory-applied 6" seam tape.
- L. Lap Sealant: Manufacturer's standard, single-component sealant, colored to match membrane roofing.
- M. Water Cutoff Mastic: Manufacturer's standard butyl mastic sealant.
- N. Metal Termination Bars: Manufacturer's standard, predrilled stainless steel or aluminum bars, approximately 1 by 1/8 inch (25 by 3 mm) thick; with anchors.
- O. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening components to substrate, and acceptable to roofing system manufacturer.
- P. Miscellaneous Accessories: Provide pourable sealers, preformed cone and vent sheet flashings, molded pipe boot flashings, preformed inside and outside corner sheet flashings, reinforced EPDM securement strips, T-joint covers, in-seam sealants, termination reglets, cover strips, and other accessories.
 - 1. Provide white flashing accessories for white EPDM membrane roofing.

2.4 ROOF INSULATION

- A. Polyisocyanurate Board Insulation: ASTM C 1289, felt or glass-fiber mat facer on both major surfaces.
 - 1. Size: 48 by 48 inches or 48 by 96 inches
 - 2. Thickness:
 - a. Base Layer: 2.2 inches
 - b. Upper Layer: 2.2 inches
- B. Composite Polyisocyanurate Board Insulation: ASTM C 1289, with factory-applied facing board on one major surface, as indicated below by type, and felt or glass-fiber mat facer on the other.
 - 1. Facer: Type VII, glass-mat-faced gypsum board facer, 1/4 inch (6 mm) thick.
 - 2. Size: 48 by 48 inches (1219 1219 mm or 48 by 96 inches (1219 by 2438 mm).
 - 3. Thickness:
- C. Tapered Insulation: Provide factory-tapered insulation boards (only where required to meet minimum slope requirements, and for crickets. Structural roof is sloped).
 - 1. Material: Match roof insulation
 - 2. Minimum Thickness: 1/4 inch (6.35 mm).
 - 3. Slope:
 - a. Roof Field: 1/8 inch per foot unless otherwise indicated on Drawings.
 - b. Saddles and Crickets: 1/4 inch per foot unless otherwise indicated on Drawings.

2.5 INSULATION ACCESSORIES

- A. Fasteners: Factory-coated steel fasteners and metal or plastic plates complying with corrosion-resistance provisions in FM Approvals 4470, designed for fastening roof insulation **and cover boards** to substrate, and acceptable to roofing system manufacturer.

- B. Insulation Adhesive: Insulation manufacturer's recommended adhesive formulated to attach roof insulation to substrate or to another insulation layer as follows:
 1. Modified asphaltic, asbestos-free, cold-applied adhesive.
 2. Bead-applied, low-rise, one-component or multicomponent urethane adhesive.
 3. Full-spread, spray-applied, low-rise, two-component urethane adhesive.
- C. Cover Board: ASTM C 1177/C 1177M, glass-mat, water-resistant gypsum substrate, or ASTM C 1278/C 1278M, fiber-reinforced gypsum board.
 1. Thickness **1/2 inch (13 mm)**
- D. Cover Board: ASTM C 1289 Type II, Class 4, Grade 1, 1/2-inch- (13-mm-) thick polyisocyanurate, with a minimum compressive strength of 80 psi (551 kPa).
- E. Protection Mat: Woven or nonwoven polypropylene, polyolefin, or polyester fabric; water permeable and resistant to UV degradation; type and weight as recommended by roofing system manufacturer for application.

2.6 WALKWAYS

- A. Flexible Walkways: Factory-formed, nonporous, heavy-duty, slip-resisting, surface-textured walkway **pads**, approximately 3/16 inch (5 mm) thick and acceptable to roofing system manufacturer.
 1. Size: Approximately 36 by 36 or 36 by 60 inches

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements and other conditions affecting performance of the Work.
 1. Verify that minimum concrete drying period recommended by roofing system manufacturer has passed.
 2. Verify that concrete substrate is visibly dry and free of moisture, and that minimum concrete internal relative humidity is not more than **75** percent, or as recommended by roofing system manufacturer when tested according to ASTM F 2170.
 3. Verify that concrete-curing compounds that will impair adhesion of roofing components to roof deck have been removed.
 4. Verify that joints in precast concrete roof decks have been grouted flush with top of concrete.

3.2 PREPARATION

- A. Perform fastener-pullout tests according to roof system manufacturer's written instructions.
 1. Submit test result within 24 hours of performing tests.
 - a. Include manufacturer's requirements for any revision to previously submitted fastener patterns required to achieve specified wind uplift requirements.
- B. Install sound-absorbing insulation strips according to acoustical roof deck manufacturer's written instructions.

3.3 ROOFING INSTALLATION, GENERAL

- A. Install roofing system according to roofing system manufacturer's written instructions, FM Approvals' RoofNav assembly requirements, and FM Global Property Loss Prevention Data Sheet 1-29.
- B. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system at end of workday or when rain is forecast. Remove and discard temporary seals before beginning work on adjoining roofing.
- C. Install roof membrane and auxiliary materials to tie in to existing roofing to maintain weathertightness of transition and to not void warranty for existing roofing system.
- D. Coordinate installation and transition of roofing system component serving as an air barrier with a 40 mil. self-adhering Modified Bituminous Sheet Air Barrier.

3.4 INSULATION INSTALLATION

- A. Coordinate installing roofing system components so insulation is not exposed to precipitation or left exposed at end of workday.
- B. Comply with roofing system and insulation manufacturer's written instructions for installing roof insulation.
- C. Installation Over Concrete Decks:
 - 1. Install base layer of insulation with **joints staggered** not less than 24 inches (610 mm) in adjacent rows and end joints staggered not less than 12 inches (305 mm) in adjacent rows.
 - a. Where installing composite and noncomposite insulation in two or more layers, install noncomposite board insulation for bottom layer and intermediate layers, if applicable, and install composite board insulation for top layer.
 - b. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - c. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.
 - d. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 48 inches.
 - 1) Trim insulation so that water flow is unrestricted.
 - e. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - f. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - g. Loosely lay base layer of insulation units over substrate.
 - h. Adhere base layer of insulation to vapor retarder according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
 - 1) Prime surface of concrete deck with asphalt primer at rate of 3/4 gal./100 sq. ft. (0.3 L/sq. m), and allow primer to dry.
 - 2) Set insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
 - 3) Set insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - 4) Set insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
 - 2. Install upper layers of insulation (and tapered insulation where required) with joints of each layer offset not less than 12 inches (305 mm) from previous layer of insulation.
 - a. Staggered end joints within each layer not less than 24 inches (305 mm) in adjacent rows.
 - b. Install with long joints continuous and with end joints staggered not less than 12 inches (305 mm) in adjacent rows.
 - c. Trim insulation neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 - d. Make joints between adjacent insulation boards not more than 1/4 inch (6 mm) in width.
 - e. At internal roof drains, slope insulation to create a square drain sump with each side equal to the diameter of the drain bowl plus 24 inches (610 mm).
 - 1) Trim insulation so that water is unrestricted.
 - f. Fill gaps exceeding 1/4 inch (6 mm) with insulation.
 - g. Cut and fit insulation within 1/4 inch (6 mm) of nailers, projections, and penetrations.
 - h. Loosely lay each layer of insulation units over substrate.
 - i. Adhere each layer of insulation to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:

- 1) Set each layer of insulation in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
- 2) Set each layer of insulation in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
- 3) Set each layer of insulation in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.

3.5 INSTALLATION OF COVER BOARDS

- A. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Offset joints of insulation below a minimum of 6 inches (150 mm) in each direction.
 1. Trim cover board neatly to fit around penetrations and projections, and to fit tight to intersecting sloping roof decks.
 2. At internal roof drains, conform to slope of drain sump.
 - a. Trim cover board so that water flow is unrestricted.
 3. Cut and fit cover board tight to nailers, projections, and penetrations.
 4. Loosely lay cover board over substrate.
 5. Adhere cover board to substrate using adhesive according to FM Approvals' RoofNav assembly requirements and FM Global Property Loss Prevention Data Sheet 1-29 for specified Windstorm Resistance Classification, as follows:
 - a. Set cover board in a solid mopping of hot roofing asphalt, applied within plus or minus 25 deg F (14 deg C) of equiviscous temperature.
 - b. Set cover board in ribbons of bead-applied insulation adhesive, firmly pressing and maintaining insulation in place.
 - c. Set cover board in a uniform coverage of full-spread insulation adhesive, firmly pressing and maintaining insulation in place.
- B. Install slip sheet over cover board and immediately beneath roofing.

3.6 ADHERED ROOFING INSTALLATION

- A. Adhere roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll membrane roof membrane and allow to relax before installing.
- C. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- D. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- E. Bonding Adhesive: Apply to substrate and underside of roof membrane at rate required by manufacturer, and allow to partially dry before installing roof membrane. Do not apply to splice area of roof membrane.
- F. Hot Roofing Asphalt: Apply a solid mopping of hot roofing asphalt to substrate at temperature and rate required by manufacturer, and install fabric-backed roofing. Do not apply to splice area of roof membrane.
- G. Fabric-Backed Roof Membrane Adhesive: Apply to substrate at rate required by manufacturer, and install fabric-backed roof membrane.
- H. In addition to adhering, mechanically fasten roof membrane securely at terminations, penetrations, and perimeters.
- I. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- J. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 2. Apply lap sealant and seal exposed edges of roofing terminations.
 3. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.
- K. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.

2. Apply lap sealant and seal exposed edges of roofing terminations.
- L. Factory-Applied Seam Tape Installation: Clean and prime surface to receive tape.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 2. Apply lap sealant and seal exposed edges of roofing terminations.
- M. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.
- N. Adhere protection sheet over roof membrane at locations indicated.

3.7 MECHANICALLY FASTENED MEMBRANE ROOFING INSTALLATION

- A. Mechanically fasten roof membrane over area to receive roofing according to roofing system manufacturer's written instructions.
- B. Unroll roofing membrane and allow to relax before installing.
- C. For in-splice attachment, install roof membrane with long dimension perpendicular to steel roof deck flutes.
- D. Start installation of roofing in presence of roofing system manufacturer's technical personnel.
- E. Accurately align roof membrane, and maintain uniform side and end laps of minimum dimensions required by manufacturer. Stagger end laps.
- F. Mechanically fasten or adhere roof membrane securely at terminations, penetrations, and perimeter of roofing.
- G. Apply roof membrane with side laps shingled with slope of roof deck where possible.
- H. Adhesive Seam Installation: Clean both faces of splice areas, apply splicing cement.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 2. Apply lap sealant and seal exposed edges of roofing terminations.
 3. Apply a continuous bead of in-seam sealant before closing splice if required by roofing system manufacturer.
- I. Tape Seam Installation: Clean and prime both faces of splice areas, apply splice tape.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 2. Apply lap sealant and seal exposed edges of roofing terminations.
- J. Factory-Applied Seam Tape Installation: Clean and prime surface to receive tape.
 1. Firmly roll side and end laps of overlapping roof membrane to ensure a watertight seam installation.
 2. Apply lap sealant and seal exposed edges of roofing terminations.
- K. Spread sealant or mastic bed over deck-drain flange at roof drains, and securely seal roof membrane in place with clamping ring.
- L. In-Splice Attachment: Secure one edge of roof membrane using fastening plates or metal battens centered within splice, and mechanically fasten roof membrane to roof deck. Field splice seam.
- M. Through-Membrane Attachment: Secure roofing using fastening plates or metal battens, and mechanically fasten roof membrane to roof deck. Cover battens and fasteners with a continuous cover strip.
- N. Adhere protection sheet over roof membrane at locations indicated.

3.8 BASE FLASHING INSTALLATION

- A. Install sheet flashings and preformed flashing accessories, and adhere to substrates according to roofing system manufacturer's written instructions.
- B. Apply bonding adhesive to substrate and underside of sheet flashing at required rate, and allow to partially dry. Do not apply to seam area of flashing.
- C. Flash penetrations and field-formed inside and outside corners with cured or uncured sheet flashing.
- D. Clean splice areas, apply splicing cement, and firmly roll side and end laps of overlapping sheets to ensure a watertight seam installation. Apply lap sealant and seal exposed edges of sheet flashing terminations.

- E. Terminate and seal top of sheet flashings and mechanically anchor to substrate through termination bars.

3.9 WALKWAY INSTALLATION

- A. Flexible Walkways: Install walkway products according to manufacturer's written instructions.
 - 1. Install flexible walkways at the following locations:
 - a. Perimeter of each rooftop unit.
 - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
 - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
 - d. Top and bottom of each roof access ladder.
 - e. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
 - f. Locations indicated on Drawings.
 - g. As required by roof membrane manufacturer's warranty requirements.
 - 2. Provide 6-inch (76-mm) clearance between adjoining pads.
 - 3. Adhere walkway products to substrate with compatible adhesive according to roofing system manufacturer's written instructions.
- B. Roof-Paver Walkways: Install walkway roof pavers according to manufacturer's written instructions.
 - 1. Install roof paver walkways at the following locations:
 - a. Perimeter of each rooftop unit.
 - b. Between each rooftop unit location, creating a continuous path connecting rooftop unit locations.
 - c. Between each roof hatch and each rooftop unit location or path connecting rooftop unit locations.
 - d. Top and bottom of each roof access ladder.
 - e. Between each roof access ladder and each rooftop unit location or path connecting rooftop unit locations.
 - f. Locations indicated on Drawings.
 - g. As required by roof membrane manufacturer's warranty requirements.
 - 2. Provide 3 inches (75 mm) of space between adjacent roof pavers.

3.10 PROTECTING AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period. When remaining construction does not affect or endanger roofing system, inspect roofing system for deterioration and damage, describing its nature and extent in a written report, with copies to Architect and Owner.
- B. Correct deficiencies in or remove roofing system that does not comply with requirements, repair substrates, and repair or reinstall roofing system to a condition free of damage and deterioration at time of Substantial Completion and according to warranty requirements.
- C. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 5323

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 RELATED DOCUMENTS

Drawings and general provisions of the contract, including General, Supplemental and Special Conditions and other Division 1 Specification sections apply to work of this section.

1.2 WORK INCLUDED

1.2.1 Installation of new pre-finished sheet metal manufactured coping cap, edge metal, fascia, through wall scuppers, gutters, downspouts, counterflashings, metal siding closures and miscellaneous sheet metal flashing and trim as may be needed. Patch and/or repair existing metal deck holes from abandoned penetrations as described in the project specifications and shown on the project drawings.

1.2.2

1.3 RELATED WORK SPECIFIED ELSEWHERE

1.3.1 Section 01 1000 - Summary of Work

1.3.2 Section 06 1000 - Rough Carpentry

1.3.3 Section 07 5323 - Ethylene-Propylene-Diene-Monomer (EPDM) Roofing

1.3.4 Section 07 9200 - Joint Sealants

1.4 QUALITY ASSURANCE

1.4.1 Qualifications of the Manufacturer: Products used in the work of this section shall be produced by manufacturers regularly engaged in the manufacture of similar items and with a history of successful production acceptable to the Owner.

1.4.2 Qualifications of the Installer: Use adequate number of skilled workmen who are thoroughly trained and experienced in the necessary crafts and are completely familiar with the specified requirements and the methods needed for the proper performance of the work in this section.

1.4.3 In acceptance or rejection of the work of this section, the Owner shall make no allowance for lack of skill on the part of the workmen.

1.4.4 Follow all local and state building codes, ANSI/SPRI ES-1 criteria and FM criteria for coping caps and edge metal conditions.

1.4.4 Follow recommendations by SMACNA and NRCA.

1.5 SHOP DRAWINGS

1.5.1 Submit shop drawings in accordance with Section 01 3000 – Administrative Requirements.

1.5.2 Indicate material profile, jointing pattern, jointing details, fastening methods, and installation details, type and gauge of metal.

1.6 SUBMITTALS

1.6.1 Submit samples in accordance with Section 01 3000 – Administrative Requirements.

1.6.2 Submit to Owner's Representative a 12-inch length of each sheet metal configuration prior to total project fabrication. Provide mockups as requested.

1.6.3 Provide a mockup for scupper.

1.7 STORAGE AND HANDLING

1.7.1 Store materials so as to maintain clean, dry, off-ground, weathertight conditions and to protect against loss, damage, and wetting.

1.7.2 Stack material to prevent twisting, bending, or abrasion.

1.7.3 During storage prevent material contact with any substance that would discolor or stain, including soil and water.

1.7.4 Store and handle metal as per new material. Prevent damage from on-going roofing activity.

1.8 SCHEDULING

- 1.8.1 All new sheet metal work shall be closely coordinated with the installation of the new roofing materials.
- 1.8.2 New sheet metal shall be installed directly after roofing work such that roofing terminations will not be left unprotected by metal.

1.9 WARRANTY

- 1.9.1 Warranty shall be in accordance with Section 01 7800 – Closeout Submittals.

PART 2 PRODUCTS

2.1 SHEET METAL MATERIALS

- 2.1.4 Downspout: Fabricate downspout using minimum 24 gauge metal with a 20 year Kynar 500 finish. Join metal with watertight seaming.
- 2.1.6 Scupper Trim: 26 GA. Stainless Steel 304, shaped and sized as indicated on project drawings.
- 2.1.7 Conductor Box: .060 aluminum shaped as indicated on project drawings with mitered and welded joints and with a 20 year Kynar 500 finish, manufactured by Metal Era or approved equal.
- 2.1.8 Counterflashing and miscellaneous metal profiles – minimum 26 gauge stainless steel with
- 2.1.9 Stainless Steel: Conforming to ASTM A240 and/or ASTM A666
- 2.1.10 Aluminum: Conforming to ASTM B-209.
- 2.1.11 Galvalume: Conforming to ASTM A-792.
- 2.1.12 Roof Curbs:
 - .1 Rail roof curbs for free standing roof top equipment. Curbs shall be constructed from 18 ga. galvanized steel, unitized construction with integral base plate, continuous welded corners seams, pressure treated wood nailer, counterflashing with screws and internally re-enforced. All exposed screws shall be stainless steel and have an EPDM/stainless steel composite washer installed under the screw head. New rail curbs shall match the existing curbs in size, length and width. New rail curbs shall extend a minimum of 8” above the finished roof system. Curbs shall be fabricated to set level on the sloped roof deck. Basis of Design: Rail curbs shall be as manufactured by The Pate Company, 245 Eisenhower Lane South, Lombard, ILL. 60148, model – pate equipment support es-2, or approved equal.
 - .2 Steel roof curbs shall be constructed from 18 ga. galvanized steel, unitized construction with integral base plate, continuous welded corners seams, pressure treated wood nailer, counterflashing with screws and internally re-enforced. All exposed screws shall be stainless steel and have an EPDM/stainless steel composite washer installed under the screw head. New roof curbs shall extend a minimum of 8” above the finished roof system. Curbs shall be fabricated to set level on the sloped roof deck. Roof curbs shall be as manufactured by The Pate Company, 245 Eisenhower Lane South, Lombard, ILL. 60148, model – pate equipment support es-2, or approved equal.

2.2 ACCESSORY MATERIALS

- 2.2.1 Fasteners: Shall be type and size as required by construction.
 - .1 For concealed fastening into wood, use fasteners according to the coping cap requirements based upon ANSI/SPRI Wind Design Standard ES-1.
 - .2 For exposed fastening into wood, use stainless steel screws with EPDM/Stainless Steel washers (color to match painted metal).
 - .3 For fastening into concrete, use masonry/concrete anchors with EPDM/Stainless Steel washers. Use all metal anchors only, no plastic anchors allowed.
 - .4 For fastening into steel, use self-drilling, self-tapping hex head or pan head, minimum 1-1/4” long. For exposed fasteners into steel use stainless steel self drilling, self

- tapping hex head or pan head fasteners with EPDM/Stainless Steel washers (color to match painted metal)
- 2.2.2 Pop Rivets: Shall be 1/8 inch to 3/16 inch diameter with stainless steel mandrels and washers, color clad to match pre-finished metal.
 - 2.2.3 Masonry Fasteners: Shall be 1/4 inch diameter mushroom head, one-piece nail drive anchor; zinc alloy body with stainless steel drive nail. Fasteners shall provide a minimum of 1 1/4" embedment into masonry. Plastic or vinyl anchors are not permitted.
 - 2.2.4 Masonry Screws: Shall be a stainless steel (Type 410) screw 3/16" or 1/4" diameter (depending on application), with a flat, oval or hex head (depending on application). Depth of embedment in solid material shall be a minimum of 1 1/4". All exposed masonry screws shall have an EPDM/stainless steel composite washer installed under the screw head.
 - 2.2.5 Termination Bar: Shall be 1/8 inch x 1 inch, 304 stainless steel flat bar, hot rolled annealed, pickled and conforming to requirements of ASTM A276. Bar shall have pre-drilled holes 6 inches o.c. Holes shall be slotted. Termination Bar shall be deburred before installing.
 - 2.2.6 Sealant: Shall be as specified in Section 07 92 00.
 - 2.2.7 Screws: Shall be stainless steel self-drilling, self-tapping, No. 12 hex head or pan head minimum 1-1/4 inches long or as required by systems manufacturer.

2.3 FABRICATION

- 2.3.1 In addition to complying with all pertinent codes and regulations, comply with all pertinent recommendations as noted in "Architectural Sheet Metal Manual", 5th edition, 1993, as published by the Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA).
- 2.3.2 Fabricate and install sheet metal sections in 10-foot lengths except where shorter lengths are required by construction. Provide adequate provisions for expansion and contraction.
- 2.3.3 Form sections square, true, and accurate to size, free from distortion, sharp edges, and other defects detrimental to appearance or performance.
- 2.3.4 Junctures, intersections, corners and unions of sheet metal shall be held to a minimum of 18-inch legs.
- 2.3.5 At all locations where new sheet metal sections abut walls, copings or terminate sheet metal shall be terminated with end sections and end dams. Terminating or end pieces shall be of one piece construction with watertight seams; seams shall be pop riveted and sealed.
- 2.3.6 Sheet metal flashing shall be fabricated and installed to allow for expansion and contraction of the component materials without buckling, hole elongation, fastener failure or excess stress loading situations developing at any time during the temperature cycle. Clips shall be designed and installed to resist rotation and to avoid shear stress when roofing material expands and contracts.

PART 3 EXECUTION

3.1 INSPECTION

- 3.1.1 Verify that nailer areas are clean, smooth, free of depressions, waves, or projections and solidly supported joints.
- 3.1.2 Verify that roof openings, pipes, sleeves or vents through roof are solidly set.
- 3.1.3 Verify compatibility of flashing system with other system materials.
- 3.1.4 Verify installation of all appropriate base flashings prior to installation of sheet metal.
- 3.1.5 Verify existing field conditions. Minor dimensional detail changes may be required to fit existing conditions.

3.2 INSTALLATION - GENERAL

- 3.2.1 Dissimilar metals shall be kept separated to prevent galvanic action. Preventative measures shall include separation by suitable bituminous paint.
- 3.2.2 All metal flanges shall be installed on top of membrane and the flange set in a full bed of sealant.

- 3.2.3 All exposed edges of sheet metal shall be folded back, or "hemmed", on concealed surfaces.
- 3.2.4 Form and install new edge metal, fascia coping, trim, counterflashing, etc., in accordance with detail drawings, SMACNA and ANSI/SPRI ES-1 recommendations and/or requirements.
- 3.2.5 Where lap seams do not have a joint cover, lap according to pitch, but in no case less than 4 inches.
- 3.2.6 Make all lap seams in the direction of water flow.
- 3.2.7 Finish all sheet metal watertight and weather tight.
- 3.2.8 Anchor downspout to wall with minimum two anchor straps and no more than eight feet apart.
- 3.2.9 Set concrete splash block at bottom of downspout and direct water flow from building wall. Install roof membrane slip sheet under splash block.

3.3 EDGE METAL / DRIP SILL / FASCIA

- 3.3.1 Fabricated edge metal systems shall be tested and must be in compliance with ANSI/SPRI ES-1 (Wind Design Standards for Edge Systems on Low Slope Roofs) standards.
- 3.3.2 The Contractor must submit documentation and proof from the testing agency that the shop fabricated edge metal system is in compliance with ANSI/SPRI ES-1 standards.
 - 3.3.3 The Contractor must submit detailed shop drawings of the edge metal systems indicating profiles, splicing, length of pieces, materials used in fabrication, installation techniques, fasteners, etc.
- 3.3.4 The Owner and/or Owner's Representative must approve all shop drawings before installation of all shop fabricated edge metal systems.
- 3.3.5 All pre-manufactured perimeter edge metal systems shall be supplied by the roofing systems manufacturer and be incorporated into the project's Full Systems warranty.

3.4 COPING CAP / PRE-MANUFACTURED

- 3.4.1 Refer to Section 07 7100 Roof Specialties - All pre-manufactured coping cap systems shall be installed in compliance with ANSI/SPRI ES-1 (Wind Design Standards for Edge Systems on Low Slope Roofs) standards.
- 3.4.2 All pre-manufactured perimeter coping cap systems shall be supplied by the roofing systems manufacturer and be incorporated into the project's Full Systems warranty.
- 3.4.3 Pre-manufactured coping cap systems shall be installed in accordance with the manufacturer's requirements and the project documents.

3.5 COUNTERFLASHING

- 3.5.1 Form and install new counterflashing metal as shown in detail drawings. Lap joints a minimum of 4 inches and stagger joints a minimum of 2 feet from adjacent or abutting metal flashings (through wall or extension flashings) joints.
- 3.5.2 Apply sealant between flat surface of counterflashing and walls, curbs, etc. prior to securing.
- 3.5.3 At areas where counterflashing is to be installed without benefit of sawcut reglet and receiver, anchor counterflashing to walls, curbs, etc., using appropriate fastener (for wall substrate material) fasten counterflashing 8 inches o.c. Use EPDM/Stainless Steel washers to seal fasteners.
- 3.5.4 Seal top edge of counterflashing joint by dry tooling; sealant shall be installed to shed water.
- 3.5.5 Scupper and Conductor Box: Seal all edges of counterflashing; sealant shall be installed to shed water.

3.6 CLEAN-UP

- 3.6.1 Factory-applied plastic release film shall be removed from all exposed pre-finished metal.
- 3.6.2 Clean and neutralize all flux materials.
- 3.6.3 All excess solder and sealants shall be cleaned from the surface.
- 3.6.4 All hand prints, smudges and other superficial stains that were placed on the sheet metal during fabrication and installation shall be removed.
- 3.6.5 All abrasions, scratches, scrapes, etc., shall be touched up with paint furnished by the sheet metal manufacturer.
- 3.6.6 Leave job site clean at completion of work and properly dispose of all construction debris.

END OF SECTION

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**SECTION 07 7100
ROOF SPECIALTIES**

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 SECTION INCLUDES

- A. Copings.
- B. Roof-edge specialties.
- C. Counterflashings.
- D. Related Requirements:
 - 1. Section 06 1000 - Rough Carpentry.
 - 2. Section 07 6200 -Sheet Metal Flashing and Trim.
 - 3. Section 07 9200 – Joint Sealants.
- E. Pre-installation Conference: Conduct conference at Project site. Refer to Section 07 5323 – Ethylene-Propylene-Diene-Monomer (EPDM) Roofing for additional information.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes.
- B. Shop Drawings: For roof specialties.
 - 1. Include plans, elevations, expansion-joint locations, keyed details, and attachments to other work. Distinguish between plant- and field-assembled work.
 - 2. Include details for expansion and contraction; locations of expansion joints, including direction of expansion and contraction.
 - 3. Indicate profile and pattern of seams and layout of fasteners, cleats, clips, and other attachments.
 - 4. Detail termination points and assemblies, including fixed points.
 - 5. Include details of special conditions.
- C. Samples: For each type of roof specialty and for each color and texture specified.
- D. Samples for Initial Selection: For each type of roof specialty indicated with factory-applied color finishes.
- E. Samples for Verification: Include Samples of each type of roof specialty to verify finish and color selection, in manufacturer's standard sizes.

1.4 INFORMATIONAL SUBMITTALS

- A. Product Certificates: For each type of roof specialty.
- B. Product Test Reports: For copings and roof-edge flashings, for tests performed by a qualified testing agency proving compliance with specified FM Global and SPRI ES-1 criteria.
- C. Sample Warranty: For manufacturer's special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For roofing specialties to include in maintenance manuals.

1.6 QUALITY ASSURANCE

- A. Manufacturer Qualifications: A qualified manufacturer offering products meeting requirements that are FM Approvals listed for specified class and SPRI ES-1 tested to specified design pressure.
- B. Source Limitations: Obtain roof specialties approved by manufacturer providing roofing-system warranty specified in Section 07 5323 – Ethylene-Propylene-Diene-Monomer (EPDM) Roofing.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Do not store roof specialties in contact with other materials that might cause staining, denting, or other surface damage. Store roof specialties away from uncured concrete and masonry.

- B. Protect strippable protective covering on roof specialties from exposure to sunlight and high humidity, except to extent necessary for the period of roof-specialty installation.

1.8 FIELD CONDITIONS

- A. Field Measurements: Verify profiles and tolerances of roof-specialty substrates by field measurements before fabrication, and indicate measurements on Shop Drawings.
- B. Coordination: Coordinate roof specialties with flashing, trim, and construction of parapets, roof deck, roof and wall panels, and other adjoining work to provide a leak-proof, secure, and noncorrosive installation.

1.9 WARRANTY

- A. Roofing-System Warranty: Roof specialties are included in warranty provisions in Section 07 5320
- B. Special Warranty on Painted Finishes: Manufacturer agrees to repair finish or replace roof specialties that show evidence of deterioration of factory-applied finishes within specified warranty period.
 - 1. Fluoropolymer Finish: Deterioration includes, but is not limited to, the following:
 - a. Color fading more than 5 Hunter units when tested according to ASTM D 2244.
 - b. Chalking in excess of a No. 8 rating when tested according to ASTM D 4214.
 - c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.
 - 2. Finish Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. General Performance: Roof specialties shall withstand exposure to weather and resist thermally induced movement without failure, rattling, leaking, or fastener disengagement due to defective manufacture, fabrication, installation, or other defects in construction.
- B. FM Approvals' Listing: Manufacture and install copings roof-edge specialties that are tested according to the following:
 - 1. Factory Mutual Global: Listed in FM Approvals' "RoofNav" and approved for windstorm classification, **Class 1-90**. Identify materials with FM Approvals' markings.
 - 2. SPRI Wind Design Standard: Tested according to SPRI ES-1.
- C. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes to prevent buckling, opening of joints, hole elongation, overstressing of components, failure of joint sealants, failure of connections, and other detrimental effects. Provide clips that resist rotation and avoid shear stress as a result of thermal movements. Base calculations on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
 - 1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.

2.2 COPINGS

- A. Metal Copings: Manufactured coping system consisting of metal coping cap in section lengths not exceeding 12 feet, concealed anchorage; with corner units, end cap units, and concealed splice plates with finish matching coping caps.
 - 1. Basis of Design: Perma-Tite Coping Cap System, by Metal Era, or approved equal; 20 gauge galvanized anchor clips and factory applied stainless steel springs. Snap on design Coping Cover – 22 gauge galvanized minimum, with 8 inch splice plates with butyl sealant strips. Coping Cover and splice plates are to be finished with a 20 year Kynar 500 finish. Miters are to be fully welded and manufactured to fit site conditions. Color to be selected by the Architect. Coping Cap system must meet ANSI/SPRI Wind Design Standard ES-1. Slope toward the new roof shall be built in to the coping cap system. (.5" in 12" minimum) Coping Cap system and installation shall be incorporated into the roof system "Full System's No Dollar Limit Roof Warranty"

2.3 ROOF-EDGE SPECIALTIES

- A. Canted Roof-Edge: Manufactured, two-piece, roof-edge fascia consisting of snap-on or compression-clamped metal fascia cover in section lengths not exceeding 12 feet and a

continuous formed galvanized-steel sheet cant, 0.028 inch thick, minimum, with extended vertical leg terminating in a drip-edge cleat. Provide matching corner units.

1. Edge Metal/ Fascia Basis of Design: Anchor-Tite Fascia System, by Metal Era, or approved equal with straight and radius sections fabricated using minimum 24 gauge metal fascia cover and extruded aluminum anchor bar with factory fabricated miters and with a 20 year Kynar 500 finish. System must meet ANSI/SPRI Wind Design Standard ES-1. Edge Metal / Fascia system and installation shall be incorporated into the roof system "Full System's No Dollar Limit Roof Warranty".
2. Corners: Factory mitered and mechanically clinched and sealed watertight.
3. Splice Plates: Concealed, of same material, finish, and shape as fascia cover.
4. Fascia Accessories: Downspout scuppers with integral conductor head and downspout adapters and perforated screens.

2.4 COUNTERFLASHINGS

- A. Counterflashings: Manufactured units of heights to overlap top edges of base flashings by 4 inches and in lengths not exceeding 12 feet designed to snap into reglets or through-wall-flashing receivers and compress against base flashings with joints lapped, from the following exposed metal:
 1. Zinc-Coated Steel: 0.028-inch thickness.
- B. Accessories:
 1. Flexible-Flashing Retainer: Provide resilient plastic or rubber accessory to secure flexible flashing in reglet where clearance does not permit use of standard metal counterflashing or where reglet is provided separate from metal counterflashing.
 2. Counterflashing Wind-Restraint Clips: Provide clips to be installed before counterflashing to prevent wind uplift of counterflashing lower edge.

2.5 UNDERLAYMENT MATERIALS

- A. Self-Adhering, High-Temperature Sheet: Minimum 40 mils thick, consisting of slip-resisting polyethylene-film top surface laminated to layer of butyl or SBS-modified asphalt adhesive, with release-paper backing; cold applied. Provide primer when recommended by underlayment manufacturer.
 1. Thermal Stability: ASTM D 1970; stable after testing at 240 deg F.
 2. Low-Temperature Flexibility: ASTM D 1970; passes after testing at minus 20 deg F.
- B. Felt: ASTM D 226, Type II (No. 30), asphalt-saturated organic felt, non-perforated.
- C. Slip Sheet: Rosin-sized building paper, 3-lb/100 sq. ft. minimum.

2.6 MISCELLANEOUS MATERIALS

- A. Fasteners: Manufacturer's recommended fasteners, suitable for application and designed to meet performance requirements. Furnish the following unless otherwise indicated:
 1. Fasteners for Zinc-Coated (Galvanized) Steel Sheet: Series 300 stainless steel or hot-dip zinc-coated steel according to ASTM A 153 or ASTM F 2329.
- B. Elastomeric Sealant: ASTM C 920, elastomeric silicone polymer sealant of type, grade, class, and use classifications required by roofing-specialty manufacturer for each application.
- C. Butyl Sealant: ASTM C 1311, single-component, solvent-release butyl rubber sealant; polyisobutylene plasticized; heavy bodied for hooked-type joints with limited movement.
- D. Bituminous Coating: Cold-applied asphalt emulsion complying with ASTM D 1187.
- E. Asphalt Roofing Cement: ASTM D 4586, asbestos free, of consistency required for application.

2.7 FINISHES

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical and painted finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

- D. Zinc-Coated Steel Finish: Two-coat fluoropolymer.
 - 1. Color: As selected by the Architect.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, to verify actual locations, dimensions, and other conditions affecting performance of the Work.
- B. Examine walls, roof edges, and parapets for suitable conditions for roof specialties.
- C. Verify that substrate is sound, dry, smooth, clean, sloped for drainage where applicable, and securely anchored.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 UNDERLAYMENT INSTALLATION

- A. Self-Adhering Sheet Underlayment: Apply primer if required by manufacturer. Comply with temperature restrictions of underlayment manufacturer for installation. Apply wrinkle free, in shingle fashion to shed water, and with end laps of not less than 6 inches staggered 24 inches between courses. Overlap side edges not less than 3-1/2 inches. Roll laps with roller. Cover underlayment within 14 days.
 - 1. Apply continuously under copings, roof-edge specialties, reglets and counterflashings.
 - 2. Coordinate application of self-adhering sheet underlayment under roof specialties with requirements for continuity with adjacent air barrier materials.
- B. Felt Underlayment: Install with adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.
- C. Slip Sheet: Install with tape or adhesive for temporary anchorage to minimize use of mechanical fasteners under roof specialties. Apply in shingle fashion to shed water, with lapped joints of not less than 2 inches.

3.3 INSTALLATION, GENERAL

- A. General: Install roof specialties according to manufacturer's written instructions. Anchor roof specialties securely in place, with provisions for thermal and structural movement. Use fasteners, solder, protective coatings, separators, underlayments, sealants, and other miscellaneous items as required to complete roof-specialty systems.
 - 1. Install roof specialties level, plumb, true to line and elevation; with limited oil-canning and without warping, jogs in alignment, buckling, or tool marks.
 - 2. Provide uniform, neat seams with minimum exposure of solder and sealant.
 - 3. Install roof specialties to fit substrates and to result in weathertight performance. Verify shapes and dimensions of surfaces to be covered before manufacture.
 - 4. Torch cutting of roof specialties is not permitted.
 - 5. Do not use graphite pencils to mark metal surfaces.
- B. Metal Protection: Protect metals against galvanic action by separating dissimilar metals from contact with each other or with corrosive substrates by painting contact surfaces with bituminous coating or by other permanent separation as recommended by manufacturer.
 - 1. Bed flanges in thick coat of asphalt roofing cement where required by manufacturers of roof specialties for waterproof performance.
- C. Expansion Provisions: Allow for thermal expansion of exposed roof specialties.
 - 1. Space movement joints at a maximum of 12 feet with no joints within 18 inches of corners or intersections unless otherwise indicated on Drawings.
 - 2. When ambient temperature at time of installation is between 40 and 70 deg F, set joint members for 50 percent movement each way. Adjust setting proportionately for installation at higher ambient temperatures.
- D. Fastener Sizes: Use fasteners of sizes that penetrate wood blocking not less than 1-1/4 inches for nails and not less than 3/4 inch for wood screws] [substrate not less than recommended by fastener manufacturer to achieve maximum pull-out resistance.
- E. Seal concealed joints with butyl sealant as required by roofing-specialty manufacturer.

- F. Seal joints as required for weathertight construction. Place sealant to be completely concealed in joint. Do not install sealants at temperatures below 40 deg F.
- G. Soldered Joints: Clean surfaces to be soldered, removing oils and foreign matter. Pre-tin edges of sheets to be soldered to a width of 1-1/2 inches; however, reduce pre-tinning where pre-tinned surface would show in completed Work. Tin edges of uncoated copper sheets using solder for copper. Do not use torches for soldering. Heat surfaces to receive solder and flow solder into joint. Fill joint completely. Completely remove flux and spatter from exposed surfaces.

3.4 COPING INSTALLATION

- A. Install cleats, anchor plates, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor copings with manufacturer's required devices, fasteners, and fastener spacing to meet performance requirements.

3.5 ROOF-EDGE SPECIALTIES INSTALLATION

- A. Install cleats, cants, and other anchoring and attachment accessories and devices with concealed fasteners.
- B. Anchor roof edgings with manufacturer's required devices, fasteners, and fastener spacing to

3.6 REGLET AND COUNTERFLASHING INSTALLATION

- A. General: Coordinate installation of reglets and counterflashings with installation of base flashings.
- B. Counterflashings: Insert counterflashings into reglets or other indicated receivers; ensure that counterflashings overlap 4 inches (100 mm) over top edge of base flashings. Lap counterflashing joints a minimum of 4 inches (100 mm) and bed with butyl sealant. Fit counterflashings tightly to base flashings.

3.7 CLEANING AND PROTECTION

- A. Clean exposed metal surfaces of substances that interfere with uniform oxidation and weathering.
- B. Clean and neutralize flux materials. Clean off excess solder and sealants.
- C. Remove temporary protective coverings and strippable films as roof specialties are installed. On completion of installation, clean finished surfaces, including removing unused fasteners, metal filings, pop rivet stems, and pieces of flashing. Maintain roof specialties in a clean condition during construction.
- D. Replace roof specialties that have been damaged or that cannot be successfully repaired by finish touchup or similar minor repair procedures.

END OF SECTION 07 7100

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**SECTION 07 8400
FIRESTOPPING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Firestopping systems.
- B. Firestopping of all joints and penetrations in fire-resistance rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.2 RELATED REQUIREMENTS

- A. Refer to the Drawings for plumbing, mechanical, and electrical penetrations requiring firestopping.

1.3 REFERENCE STANDARDS

- A. ASTM E814 - Standard Test Method for Fire Tests of Through-Penetration Fire Stops.
- B. Factory Mutual Research Corporation
 - 1. FM 4991 - Approval of Firestop Contractors.
 - 2. FM P7825 - Approval Guide.
- C. SCAQMD 1168 - South Coast Air Quality Management District Rule No.1168.
- D. Underwriters Laboratories Inc. - UL (FRD) - Fire Resistance Directory.

1.4 SUBMITTALS

- A. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.
- B. Product Data: Provide data on product characteristics, performance ratings, and limitations.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation instructions.
- D. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.
- E. Qualification statements for installing mechanics.

1.5 QUALITY ASSURANCE

- A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
 - 1. Listing in the current-year classification or certification books of UL, FM, or ITS (Warnock Hersey) will be considered as constituting an acceptable test report.
 - 2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
 - 3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.
- B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.
- C. Installer Qualifications: Company specializing in performing the work of this section and:
 - 1. Approved by Factory Mutual Research under FM Standard 4991, Approval of Firestop Contractors, or meeting any two of the following requirements.
 - 2. With minimum 3 years documented experience installing work of this type.
 - 3. Able to show at least 5 satisfactorily completed projects of comparable size and type.
 - 4. Licensed by authority having jurisdiction.

1.6 FIELD CONDITIONS

- A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation. Maintain minimum temperature before, during, and for 3 days after installation of materials.
- B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.1 FIRESTOPPING - GENERAL REQUIREMENTS

- A. Manufacturers:
 - 1. Graybar (3M Fire Protection Products) or equal.

- B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Type required for tested assembly design.

2.2 FIRESTOPPING ASSEMBLY REQUIREMENTS

- A. Perimeter Fire Containment Firestopping: Use any system that has been tested according to ASTM E2307 to have fire resistance F Rating equal to required fire rating of the floor assembly.
- B. Through Penetration Firestopping: Use any system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.

2.3 FIRESTOPPING SYSTEMS

- A. Firestopping: Any material meeting requirements.
 - 1. Fire Ratings: Use any system listed by UL or tested in accordance with ASTM E 814 that has F Rating equal to fire rating of penetrated assembly and T Rating Equal to F Rating and that meets all other specified requirements.
 - 2. Fire Ratings: See Drawings for required systems and ratings.

2.4 MATERIALS

- A. Elastomeric Silicone Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
- B. Firestop Devices - Wrap Type: Mechanical device with incombustible filler and sheet stainless steel jacket, intended to be installed after penetrating item has been installed.
- C. Intumescent Putty: Compound that expands on exposure to surface heat gain.

PART 3 EXECUTION

3.1 EXAMINATION: Verify openings are ready to receive the work of this section.

3.2 PREPARATION

- A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other matter that could adversely affect bond of firestopping material.
- B. Remove incompatible materials that could adversely affect bond.

3.3 INSTALLATION

- A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.
- B. Do not cover installed firestopping until inspected by authority having jurisdiction.

3.4 CLEANING: Clean adjacent surfaces of firestopping materials.

3.5 PROTECTION: Protect adjacent surfaces from damage by material installation.

END OF SECTION 07 8400

**SECTION 07 9200
JOINT SEALANTS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Joint backing and sealants.

1.2 ACTION SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. 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.

1.3 CLOSEOUT SUBMITTALS

- A. Warranties: Special warranties specified in this Section.

1.4 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.

1.5 WARRANTY

- A. Manufacturer's written agreement to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
 - 1. Warranty Period: 5 years from Project Completion Date.

PART 2 - PRODUCTS

2.1 PRODUCTS AND MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products indicated for each type in the Schedule at the end of Part 3.

2.2 PERFORMANCE REQUIREMENTS

- A. Provide elastomeric joint sealants that establish and maintain watertight and airtight continuous joint seals without staining or deteriorating joint substrates.

2.3 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. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.

2.4 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Sealants shall be tested according to ASTM C 1248.
- C. Suitability for Immersion in Liquids. Comply with ASTM C 1247 and qualify for the length of exposure indicated by reference to ASTM C 920 for Class 1 or 2. Liquid used for testing sealants is deionized water, unless otherwise indicated.

2.5 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. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin), and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance:
- C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer. Provide self-adhesive tape where applicable.

2.6 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated.
- 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 surfaces.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 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.
 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.

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.
 - c. Unglazed surfaces of ceramic tile.
 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. Glazed surfaces of ceramic tile.
- B. Joint Priming: Prime joint substrates, where recommended in writing 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. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
- D. 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.
- E. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- F. 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.
- G. Tooling of Nonsag Sealants: 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. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.

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.

3.5 PROTECTION

- A. Protect joint sealants during and after curing period so sealants are without deterioration or damage at time of Substantial Completion.
- B. 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. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, O, and A; multi- component.
 - 1. Manufacturers/Product:
 - a. Tremco Dymeric 240/240FC
 - b. Mameco Vulkem 227
 - c. BondaFlex Bondaflex PUR 2 NS
 - d. Percora Dynatrol II
 - 2. Applications: Use for:
 - a. Control, expansion, and soft joints in masonry.
 - b. Joints between concrete and other materials.
 - c. Joints between metal frames and other materials.
 - d. Control joints in cast-in-place concrete.
 - e. Joints between different materials listed above.
 - f. Perimeter joints between materials listed above and frames of doors, windows, storefronts, louvers and similar openings.

- g. Control and expansion joints in soffits and overhead surfaces.
 - h. Other exterior joints in vertical surfaces and non-traffic horizontal surfaces for which no other sealant is specified.
- B. Type 2 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
- 1. Manufacturers/Product:
 - a. Tremco Tremflex 834
 - b. Sonneborn Building Products Sonolac
 - c. Pecora Corporation AC-20 + Silicone
 - d. BondaFlex Sil 150
 - 2. Applications
 - a. Non-traffic interior locations.
 - b. Interior perimeter of window and door frames and elevator entrances.
 - c. Control and construction joints.
 - d. Miscellaneous openings and penetrations.
 - e. Joints between dissimilar materials.
 - f. Interior wall and ceiling control joints.
 - g. Interior joints between door and window frames and wall surfaces.
 - h. Perimeter joints between interior wall surfaces and frames of interior doors, windows, storefronts, and similar openings.
 - i. Other interior joints for which no other type of sealant is indicated.
 - j. Other joints as indicated.
 - 3. Comply with ASTM C 834, Type P, Grade NF.
- C. Type 3 (Multi-Component Nonsag Urethane Sealant)
- 1. Manufacturer/Product:
 - a. Mameco Vulekem 227
 - b. Pecora Corporation Dynaflex
 - c. Sonneborn NP2
 - d. BondaFlex Bondaflex PUR 2 NS
 - e. Sika Corporation, Inc. Sika-Flex-2cNS TG
 - 2. Applications:
 - a. Interior and exterior applications subject to traffic.
 - b. Control, expansion and isolation joints in cast-in-place concrete.
 - c. Joints between architectural precast concrete paving units.
 - d. Tile control and expansion joints.
 - e. Joints between different materials listed above.
 - f. Other interior and exterior traffic bearing joints in horizontal and sloped traffic surfaces
- D. Type 4 (Single-Component Mildew-Resistant Acid Curing Silicon Sealant)
- 1. Manufacturer/Product:
 - a. Dow Corning 786 Mildew Resistant
 - b. GE Silicones Sanitary SCS 1700
 - c. Pecora Corporation 898 Silicone Sanitary Sealant
 - d. Tremco Tremsil 200 [white][clear]
 - e. Bondaflex Technologies Sil 100 GP
 - 2. Applications:
 - a. Perimeter of all plumbing fixtures and adjoining walls, floors and counters.
 - b. All countertop backsplashes/all interfaces where a sink is located in the countertop.
 - c. Piping which penetrates wall and is exposed to view.
- E. Type 5 (Acoustical Joint Sealant): Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following requirements:
- 1. Product is effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
 - a. Products:

- 1) ChemRex, Inc.; Contech Brands; PL Acoustical Sealant.
- 2) Pecora Corporation; AC-20 FTR Acoustical and Insulation Sealant.
- 3) USG Corporation; SHEETROCK Acoustical Sealant.

END OF SECTION 07 9200

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**SECTION 07 9219
ACOUSTICAL 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. Section includes acoustical joint sealants.
- B. Related sections 07 9200 joint sealants.

1.3 ACTION SUBMITTALS

- A. Product Data: For each acoustical joint sealant.
- B. 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.
- C. Samples for Verification: For each kind and color of acoustical joint sealant required, provide Samples with joint sealants in 1/2-inch- wide joints formed between two 6-inch- long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Acoustical-Joint-Sealant Schedule: Include the following information:
 - 1. Joint-sealant application, joint location, and designation.
 - 2. Joint-sealant manufacturer and product name.
 - 3. Joint-sealant formulation.
 - 4. Joint-sealant color.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Provide acoustical joint-sealant products that effectively reduce airborne sound transmission through perimeter joints and openings in building construction, as demonstrated by testing representative assemblies according to ASTM E 90.

2.2 ACOUSTICAL JOINT SEALANTS

Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard non-sag, paintable, non-staining latex acoustical sealant complying with ASTM C 834.

- 1. Colors of Exposed Acoustical Joint Sealants: As selected by Architect from manufacturer's full range of colors.
- B. Acoustical Sealant for Concealed Joints: Manufacturer's standard non-sag, nondrying, nonhardening, non-skinning, non-staining, gunnable, synthetic-rubber acoustical sealant.

2.3 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by acoustical-joint-sealant manufacturer where required for adhesion of sealant to joint substrates.
- 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: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive acoustical joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting performance of the Work.
- 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 acoustical joint sealants to comply with joint-sealant manufacturer's written instructions.
- B. Joint Priming: Prime joint substrates where recommended by acoustical-joint-sealant manufacturer. 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 or primer 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 ACOUSTICAL JOINT SEALANTS

- A. Comply with acoustical joint-sealant manufacturer's written installation instructions unless more stringent requirements apply.
- B. STC-Rated Assemblies: Seal construction at perimeters, behind control joints, and at openings and penetrations with a continuous bead of acoustical joint sealant. Install acoustical joint sealants at both faces of partitions, at perimeters, and through penetrations. Comply with ASTM C 919, ASTM C 1193, and manufacturer's written recommendations for closing off sound-flanking paths around or through assemblies, including sealing partitions to underside of floor slabs above acoustical ceilings.
- C. Acoustical Ceiling Areas: Apply acoustical joint sealant at perimeter edge moldings of acoustical ceiling areas in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.

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 acoustical joint sealants and of products in which joints occur.

3.5 PROTECTION

- A. Protect acoustical 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, remove, and repair damaged or deteriorated acoustical joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION 07 9219

SECTION 08 0500
BASIC MATERIALS AND METHODS: OPENINGS

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 common requirements for openings, including doors, frames, hardware, and glazing specified in subsequent Division 08 Sections.
- B. Related Work Specified in Other Sections:
 - 1. Section 06 1000 - Rough Carpentry for concealed blocking, shims, and supplementary framing required for openings.
 - 2. Section 07 9200 - Joint Sealants

1.3 REFERENCES

- A. General: Section 01 4219 – Reference Standards.
- B. American Architectural Manufacturers Association (AAMA)
 - 1. AAMA/NWWDA 101/I.S.2-97 Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Windows and Glass Doors.
 - 2. AAMA 502-90 Voluntary Specification for Field Testing of Windows and Sliding Glass Doors.
 - 3. AAMA 701-92 Voluntary Specification for Pile Weatherstripping.
 - 4. AAMA 800-92 Voluntary Specifications and Test Methods for Sealants.
 - 5. AAMA 904-96 “Voluntary Specification for Friction Hinges in Window Applications”.
 - 6. AAMA 1503-98 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors, and Glazed Wall Sections.
 - 7. AAMA CW-10-97 Care and Handling of Architectural Aluminum from Shop to Site.
- C. American Architectural Manufacturers Association (AAMA).
 - 1. AAMA 1503.1: Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections.
- D. American Society for Testing and Materials (ASTM)
 - 1. ASTM A 36: Standard Specification for Carbon Structural Steel.
 - 2. ASTM A 123: Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
 - 3. ASTM A 229: Standard Specification for Steel Wire, Oil-Tempered for Mechanical Springs.
 - 4. ASTM A 653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 5. ASTM A 666: Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar.
 - 6. ASTM A 780: Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings.
 - 7. ASTM A 1008: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability
 - 8. ASTM A 1011: Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - 9. ASTM B 209: Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
 - 10. ASTM B 211: Standard Specification for Aluminum and Aluminum-Alloy Bar, Rod, and Wire.
 - 11. ASTM B 221: Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 12. ASTM C 177: Standard Test Method for Steady-State Heat Flux Measurements and Thermal Transmission Properties by Means of the Guarded-Hot-Plate Apparatus.
 - 13. ASTM C 542: Standard Specification for Lock-Strip Gaskets.

14. ASTM C 716: Standard Specification for Installing Lock-Strip Gaskets and Infill Glazing Materials.
 15. ASTM C 719: Standard Test Method for Adhesion and Cohesion of Elastomeric Joint Sealants Under Cyclic Movement (Hockman Cycle).
 16. ASTM C 864: Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers.
 17. ASTM C 920: Standard Specification for Elastomeric Joint Sealants. ASTM C 1036: Standard Specification for Flat Glass.
 18. ASTM C 1048: Standard Specification for Heat-Treated Flat Glass – Kind HS, Kind FT, Coated and Uncoated Glass.
 19. ASTM D 256: Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics.
 20. ASTM D 570: Standard Test Method for Water Absorption of Plastics.
 21. ASTM D 635: Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Self-Supporting Plastics in a Horizontal Position.
 22. ASTM D 638: Standard Test Method for the Tensile Properties of Plastics.
 23. ASTM D 790: Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
 24. ASTM D 792: Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
 25. ASTM D 882: Standard Test Method for Tensile Properties of Thin Plastic Sheeting.
 26. ASTM D 1056: Standard Specification for Flexible Cellular Materials – Sponge or Expanded Rubber.
 27. ASTM D1308: Standard Test Method for Effect of Household Chemicals on Clear and Pigmented Organic Finishes.
 28. ASTM D 1622: Standard Test Method for Apparent Density of Rigid Cellular Plastics.
 29. ASTM D 1761: Standard Test Methods for Mechanical Fasteners in Wood.
 30. ASTM D 2583: Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor.
 31. ASTM E 84: Standard Test Method for a Surface Burning Characteristics of Building Materials.
 32. ASTM E 283: Standard Test Method for Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors.
 33. ASTM E 330: Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference.
 34. ASTM E 331: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference.
 35. ASTM E 547: Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Cyclic Static Air Pressure Differential.
 36. ASTM E 774: Standard Specification for the Classification of the Durability of Sealed Insulating Glass Units.
 37. ASTM E 1300: Standard Practice for Determining Load Resistance of Glass in Buildings.
 38. ASTM E 2074: Standard Test Method for Fire Tests of Door Assemblies, Including Positive
 39. Pressure Testing of Side-Hinged and Pivoted Swinging Door Assemblies.
- E. Architectural Spray Coaters Association (ASCA)
1. ASCA 96 Voluntary Specification for Superior Performance of Organic Coatings on Architectural Aluminum Curtainwall, Extrusions and Miscellaneous Aluminum Components.
- F. American National Standards Institute (ANSI)/Steel Door Institute (SDI):
1. ANSI/SDI-119 Performance and Test Procedures for Steel Door Frames and Frame Anchors.
 2. ANSI /A123.1 Standard Nomenclature for Steel Doors & Steel Door Frames.
 3. ANSI /A151.1 Test Procedures and Acceptance Criteria for Physical Endurance for Steel Doors & Hardware Reinforcings.

4. ANSI/A224.1 Standard Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors & Frames.
5. ANSI/A250.4 Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frame Anchors and Hardware Reinforcings.
6. ANSI/A250.7 Nomenclature for Standard Steel Doors and Steel Frames.
7. ANSI/A250.8 SDI-100 Recommended Specifications for Standard Steel Doors & Frames.
8. ANSI A250.10 Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
9. ANSI A250.11 Recommended Erection Instructions for Steel Frames.
- G. Americans With Disabilities Act (ADA).
- H. Builders Hardware Manufacturers Association (BHMA).
- I. Consumer Product Safety Commission (CPSC)
 1. 16 CFR 1201
- J. Flat Glass Marketing Association (FGMA).
 1. FGMA Glazing Manual.
- K. National Association of Garage Door Manufacturers (NAGDM).
- L. National Fenestration Rating Council (NFRC).
 1. NFRC 100-91 Procedure for Determining Fenestration Product Thermal Properties.
 2. NFRC 200 Procedure for Determining Fenestration Product Coefficients at
 3. Normal Incidence.
 4. NFRC 300 Standard Test Method for Determining the Solar and Infrared Optical
 5. Properties of Glazing Materials and Fading Resistance of Systems.
- M. National Fire Prevention Association (NFPA).
 1. NFPA 80 Fire Doors and Windows.
 2. NFPA 252 Fire Tests for Door Assemblies.
- N. SFBC Standards.
 1. SFBC P.A. 203 - Criteria for Testing Products Subject to Cyclic Wind Pressure Loading.
 2. SFBC 3603.2 (b) (5) - Forced Entry Resistance Test.
- O. Sealed Insulating Glass Manufacturers Association (SIGMA).
 1. Publication TM-3000 "Vertical Glazing Guidelines"
- P. Underwriter's Laboratories (U.L.)
 1. UL 10B Fire Tests of Door Assemblies.
 2. UL 10C Positive Pressure Fire Tests of Door Assemblies.
 3. UL 1784 Air Leakage Tests of Door Assemblies.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements.

1.5 QUALITY ASSURANCE

- A. General: Section 01 4000 – Quality Requirements and subsequent Division 8 Sections.
- B. Installer Qualifications: Engage only qualified installers to perform work.
- C. Regulatory Requirements: Comply with requirements of authorities having jurisdiction related to the following:
 1. Fire resistance of assemblies.
 2. Accessibility requirements.
- D. Source Limitation: Obtain each type of specified product from a single qualified manufacturer and distribution source.

1.6 COORDINATION

- A. General: Section 01 3000 – Administrative Requirements, 01 4000 – Quality Requirements, and subsequent Division 08 Sections.
- B. Perform field measuring to determine dimensions for rough openings and existing openings to receive new doors and windows. Record field measurements on shop drawings and retain for record.
- C. Furnish templates, setting diagrams, and other information necessary for shop fabrication and assembly of specified products, in sufficient time to maintain the Project Schedule.

- D. Furnish installation information to other trades to ensure preparation of openings by other trades is performed in accordance with the Contract Documents, approved Shop Drawings, and the manufacturer's recommendations.
- E. Prepare doors and frames to receive scheduled hardware using templates provided by the approved hardware manufacturers.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's delivery, storage, and handling information.
- B. Establish proper storage conditions at shops, the site, and other points of delivery to prevent loss, deterioration, damage, and theft.
 - 1. Provide temporary heat and humidity control if required to achieve the conditions required by referenced standards and manufacturer's instructions.
 - 2. Provide secure lock-up for hardware products.
 - 3. Store doors and frames in accordance with referenced standards to prevent warping, condensation, and incidental damage at the site.
- C. Inspect and inventory products upon delivery. Reject defective or damaged products and promptly remove them from the Site.

PART 2 PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Section 01 6000 – Product Requirements and subsequent Division 08 Sections.
- B.

PART 3 EXECUTION

3.1 EXECUTION, GENERAL

- A. Refer to Section 01 7000 – Execution Requirements and referenced Division 08 Sections.

3.2 INSPECTION

- A. Verify acceptability of rough opening conditions in accordance with referenced standards and manufacturer's instructions. Correct non-complying conditions, including removal of interfering elements, restoration of substrates, and installation of supplementary framing, blocking, and supports to stabilize and square the openings. Do not proceed with installation until objectionable conditions are corrected.

3.3 PREPARATION

- A. Isolate framing components to prevent contact with incompatible substrates, including dissimilar metals to prevent galvanic reaction.
- B. Correct unacceptable conditions in existing substrates and existing frames and openings to ensure that finished work complies with regulatory requirements and operates properly.

3.4 INSTALLATION

- A. Install products in accordance with the drawings, manufacturer's recommendations, and approved shop drawings.
- B. Arrange for connection of electrified components to building power supply by qualified personnel.

3.5 OPERATION AND ADJUSTMENT

- A. Test installed products to ensure proper operation.

END OF SECTION 08 0500

**SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-fire-rated steel doors and frames.
- B. Steel frames for wood doors.
- C. Fire-rated steel doors and frames.
- D. Accessories, including glazing, louvers, and matching panels.

1.2 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.
- B. ANSI A250.3 - Test Procedure and Acceptance Criteria for Factory-Applied Finish Painted Steel Surfaces for Steel Doors and Frames; 2007.
- C. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.
- D. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004).
- E. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2005.
- F. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.
- G. ASTM E 413 - Classification for Rating Sound Insulation; 2004.
- H. ASTM E 1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).
- I. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.
- J. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.
- K. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2006.
- L. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements for submittal procedures.
- B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.
- C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1.4 QUALITY ASSURANCE

- A. Maintain at the project site a copy of all reference standards dealing with installation.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store in accordance with NAAMM HMMA 840.
- B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Steel Doors and Frames:
 - 1. 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. Amweld Building Products, LLC.
 - b. Benchmark; a division of Therma-Tru Corporation.
 - c. Ceco Door Products; an Assa Abloy Group company.
 - d. Curries Company; an Assa Abloy Group company.

- e. Deansteel Manufacturing Company, Inc.
- f. Firedoor Corporation.
- g. Fleming Door Products Ltd.; an Assa Abloy Group company.
- h. Habersham Metal Products Company.
- i. Kewanee Corporation (The).
- j. Mesker Door Inc.
- k. Pioneer Industries, Inc.
- l. Security Metal Products Corp.
- m. Steelcraft; an Ingersoll-Rand company.
- n. Windsor Republic Doors.

2.2 DOORS AND FRAMES

- A. Requirements for All Doors and Frames:
 - 1. Accessibility: Comply with ANSI/ICC A117.1.
 - 2. Door Top Closures: Flush with top of faces and edges.
 - 3. Door Edge Profile: Beveled on both edges.
 - 4. Door Texture: Smooth faces.
 - 5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
 - 6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
 - 7. Galvanizing for Units in Wet Areas: All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
 - 8. Finish: Factory primed, for field finishing.
- B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 STEEL DOORS

- A. Interior Doors, Non-Fire-Rated:
 - 1. Grade: ANSI A250.8 Level 1, physical performance Level C, Model 1, full flush.
 - 2. Core: Cardboard honeycomb.
 - 3. Thickness: 1-3/4 inches.
- B. Interior Doors, Fire-Rated:
 - 1. Grade: ANSI A250.8 Level 2, physical performance Level B, Model 1, full flush.
 - 2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
 - a. Rate of Temperature Rise Across Door Thickness for rated Doors: 250 F degrees.
 - b. Provide units listed and labeled by UL.
 - c. Attach fire rating label to each fire rated unit.
 - 3. Core: Mineral fiberboard.

2.4 STEEL FRAMES

- A. General:
 - 1. Comply with the requirements of grade specified for corresponding door.
 - a. ANSI A250.8 Level 1 Doors: 16 gage frames.
 - b. ANSI A250.8 Level 3 Doors: 14 gage frames.
 - c. ANSI A250.8 Level 4 Doors: 12 gage frames.
 - d. Frames for Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 18 gage
 - e. Frames for Sound-Rated Wood Doors: Comply with frame requirements specified in ANSI A250.8 for Level 1, 16 gage
 - 2. Finish: Same as for door.

3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
 4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches high to fill opening without cutting masonry units.
 5. Frames Wider than 48 Inches: Reinforce with steel channel fitted tightly into frame head, flush with top.
 6. Frames Installed Back-to-Back: Reinforce with steel channels anchored to floor and overhead structure.
- B. Interior Door Frames, Non-Fire-Rated: Knock-down type.
1. Terminated Stops: Provide at all interior doors; closed end stop terminated 6 inches above floor at 45 degree angle.
- C. Interior Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.

2.5 ACCESSORY MATERIALS

- A. Removable Stops: Formed sheet steel, shape as indicated on drawings, mitered or butted corners; prepared for countersink style tamper proof screws.
- D. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.
- E. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.
- F. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.6 FRAME ANCHORS

- A. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch thick, with corrugated or perforated straps not less than 2 inches wide by 10 inches long; or wire anchors not less than 0.177 inch thick.
1. Stud-Wall Type: Designed to engage stud, welded to back of frames; not less than 0.042 inch thick.
 2. Compression Type for Drywall Slip-on Frames: Adjustable compression anchors.
 3. Post installed Expansion Type for In-Place Concrete or Masonry: Minimum 3/8-inch-diameter bolts with expansion shields or inserts. Provide pipe spacer from frame to wall, with throat reinforcement plate, welded to frame at each anchor location.
- B. Floor Anchors: Formed from same material as frames, not less than 0.042 inch thick, and as follows:
1. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.
 2. Separate Topping Concrete Slabs: Adjustable-type anchors with extension clips, allowing not less than 2-inch height adjustment. Terminate bottom of frames at finish floor surface.

2.7 FINISH MATERIALS

- A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.
- B. Factory Finish: Complying with ANSI A 250.3, manufacturer's standard coating.
- C. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing conditions before starting work.
- B. Verify that opening sizes and tolerances are acceptable.

3.2 PREPARATION

- A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.3 INSTALLATION

- A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

- B. In addition, install fire rated units in accordance with NFPA 80.
- C. Coordinate frame anchor placement with wall construction.
- D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.
- E. Coordinate installation of hardware.
- F. Coordinate installation of glazing.
- G. Coordinate installation of electrical connections to electrical hardware items.
- H. Touch up damaged factory finishes.

3.4 TOLERANCES

- A. Clearances Between Door and Frame: As specified in ANSI A250.8.
- B. Maximum Diagonal Distortion: 1/16 in measured with straight edge, corner to corner.

3.5 ADJUSTING

- A. Adjust for smooth and balanced door movement.
- B. Adjust sound control doors so that seals are fully engaged when door is closed.

END OF SECTION

**SECTION 08 1416
FLUSH 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. Section Includes:
 - 1. Solid core doors with wood veneer faces.
 - 2. Factory finishing wood doors.
 - 3. Factory fitting wood doors to frames and factory machining for hardware.
 - 4. Light frames and glazing installed in wood doors.
- B. Related Sections:
 - 1. Section 08 7100 - Door Hardware.
 - 2. Section 08 1113 - Hollow Metal Doors and Frames.
- C. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.
 - 1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
 - 2. ANSI A208.1 – Wood Particleboard.
 - 3. Intertek Testing Service (ITS Warnock Hersey) - Certification Listings for Fire Doors.
 - 4. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
 - 5. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
 - 6. UL 10C - Positive Pressure Fire Tests of Door Assemblies; UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
 - 7. Window and Door Manufacturers Association - WDMA I.S.1-A Architectural Wood Flush Doors.

1.3 SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A classifications. Include factory finishing specifications.
- B. Shop Drawings shall include:
 - 1. Indicate location, size, and hand of each door.
 - 2. Indicate dimensions and locations of mortises and holes for hardware.
 - 3. Indicate dimensions and locations of cutouts.
 - 4. Indicate requirements for veneer matching.
 - 5. Indicate location and extent of hardware blocking.
 - 6. Indicate construction details not covered in Product Data.
 - 7. Indicate doors to be factory finished and finish requirements.
 - 8. Indicate fire protection ratings for fire rated doors.
- C. Samples for Initial Selection: For factory finished doors.
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide samples for each species of veneer and core material.
 - b. Finish veneer faced door samples with same materials proposed for factory finished doors.
 - 3. Frames for light openings, 6 inches long, for each material, type, and finish required.
- D. Warranty: Provide sample of manufacturer's warranty.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, latest edition, "Industry Standard for Architectural Wood Flush Doors".
- C. Fire Rated Wood Doors: Doors complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing at positive pressure according to NFPA 252 (neutral pressure at 40" above sill) or UL10C.
 - 1. Oversize Fire Rated Door Assemblies: For units exceeding sizes of tested assemblies provide manufacturer's construction label, indicating compliance to independent 3rd party certification agency's procedure, except for size.
 - 2. Temperature Rise Limit: Where required and at vertical exit enclosures (stairwell openings) and exit passageways, provide doors that have a maximum transmitted temperature end point of not more than 450 deg F (250 deg C) above ambient after 30 minutes of standard fire test exposure.
 - 3. Smoke Control Door Assemblies: Comply with NFPA 105.
 - a. Smoke "S" Label: Doors to bear "S" label, and include smoke and draft control gasketing applied to frame and on meeting stiles of pair doors.
- D. Pre-Submittal Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing flush wood doors.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Comply with requirements of referenced standard and manufacturer's written instructions.
- B. Package pre-finished doors individually in plastic bags and wrap bundles of doors in plastic sheeting.
- C. Mark each door on top rail with opening number used on Shop Drawings.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install doors until spaces are enclosed and weather tight, wet work in spaces is complete and dry, and HVAC system is operating and maintaining ambient temperature and humidity conditions at occupancy levels during the remainder of the construction period.

1.7 WARRANTY

- A. Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in wood face veneers exceeding 0.01 inch in a 3-inch span.
 - 2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid Core Interior Doors: Life of installation.

PART 2 - PRODUCTS

2.1 DOOR CONSTRUCTION – GENERAL

- A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.
 - 1. Fire Rated Doors: Provide construction and core as needed to provide fire ratings indicated.

2. Category A Edge Construction: Provide fire rated door edge construction with intumescent seals concealed by outer stile (Category A) at 45, 60, and 90 minute rated doors. Comply with specified requirements for exposed edges.
3. Pairs: Provide stiles with concealed intumescent seals. Comply with specified requirements for exposed edges.
 - a. Provide fire retardant stiles that are listed and labeled for applications indicated without formed steel edges and astragals.
 - b. Where required for concealed hardware, provide formed steel edges and astragals with intumescent seals. Finish steel edges and astragals with baked enamel.

2.2 CORE CONSTRUCTION

- A. Particleboard Core Doors:
 1. Particleboard: Wood fiber based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
 2. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.
 3. Blocking: As indicated under article "Blocking".

2.3 BLOCKING

- A. Non-Fire-Rated Doors:
 1. Provide blocking as indicated below:
 - a. HB1: 5 inch in doors indicated to have closers and overhead stops.
 - b. HB6: 5 inch mid-rail blocking in doors indicated to have exit devices.
- B. Fire Rated Doors:
 1. Provide blocking: HB1: 5 inch in doors indicated to have closers and overhead stops.

2.4 VENEERED DOORS FOR TRANSPARENT FINISH

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 1. ASSA ABLOY Wood Doors (GR): GPD Series.
 2. Eggers Industries (EG): Premium Series.
 3. Marshfield-Algoma (MF): Signature Series.
- B. Interior Solid Core Doors:
 1. Grade: Premium.
 2. Faces: Veneer grades as noted below; veneer minimum 1/50-inch (0.5mm) thickness at moisture content of 12% or less.
 - a. Plain Sliced Select White Birch, A grade faces.
 3. Match between Veneer Leaves: Book match.
 4. Assembly of Veneer Leaves on Door Faces:
 - b. Running Match.
 5. Pair and Set Match: Provide for doors hung in same opening or separated only by mullions.
 6. Vertical Edges: Matching same species as faces. Wood or composite material, one piece, laminated, or veneered. Minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors.
 7. Horizontal Edges: Solid wood or structural composite material meeting the minimum requirements per WDMA section P-1, Performance Standards for Architectural Wood Flush Doors
 8. Construction: Five plies. Stiles and rails are bonded to core, then entire unit sanded before applying face veneers.

2.5 FABRICATION

- A. Factory fit doors to suit frame opening sizes indicated.
 1. Comply with requirements in NFPA 80 for fire rated doors.
 2. Undercut: Per manufacturer's templates and sill condition.

- B. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 - 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 - 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.
- C. Openings: Cut and trim openings through doors in factory.
 - 1. Light Openings: Trim openings with moldings of material and profile indicated.
 - 2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."
 - 3. Louvers: Factory install louvers in prepared openings.
- D. Electrical Raceways: Provide flush wood doors receiving electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through wire transfer hardware or wiring harness specified in hardware sets in Section 08 7100 - Door Hardware. Wire nut connections are not acceptable.

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 - 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.
 - 1. Finish: Meet or exceed WDMA I.S. 1A TR8 UV Cured Acrylated Polyester finish performance requirements.
 - 2. Staining:
 - a. Custom stain to match existing doors.
 - 3. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine doors and installed door frames before hanging doors.
 - 1. Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads and plumb jambs.
 - 2. Reject doors with defects.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Hardware: For installation, see Section 08 7100 - Door Hardware.
- B. Installation Instructions: Install doors and frames to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 - 1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.
- E. Field modifications to doors shall not be permitted, except those specifically allowed by manufacturer or fire rating requirements.

3.3 ADJUSTING

- A. Operation: Re-hang or replace doors that do not swing or operate freely.
- B. Finished Doors: Replace doors that do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION 08 1416

**SECTION 08 1613
FIBERGLASS DOORS**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fiberglass reinforced plastic (FRP) doors.
- B. Frames for fiberglass reinforced plastic doors.
- C. Hinges and other door hardware.
- D. Glazing.
- E. Accessories.

1.2 RELATED REQUIREMENTS

- A. Section 09 9000 – Painting: Field finishing.

1.3 REFERENCE STANDARDS

- A. ANSI A250.4 - American National Standard Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcings; current edition.
- B. ASTM D 635 - Standard Test Method for Rate of Burning and/or Extent and Time of Burning of Plastics in a Horizontal Position; current edition.
- C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; current edition.

1.4 SUBMITTALS

- A. See Section 01 3000 Submittal Procedures.
- B. Product Data: Provide manufacturer's standard details, installation instructions, and hardware and anchor recommendations.
- C. Test Reports: Show compliance with specified criteria.
- D. Shop Drawings: Show layout and profiles; include assembly methods.
 - 1. Indicate product components, including hardware reinforcement locations and preparations, accessories, finish colors, patterns, and textures.
 - 2. Indicate wall conditions, door and frame elevations, sections, materials, gages, finishes, location of door hardware by dimension, and details of openings; use same reference numbers indicated on Drawings to identify details and openings.
- E. Selection Samples: Submit two complete sets of color chips, illustrating manufacturer's available finishes, colors, and textures.
- F. Verification Samples: Submit door surface samples for each finish specified, 10 inch by 10 inch in size, illustrating finishes, colors, and textures.
- G. Door Corner Sample: Submit corner cross sections, 10 inch by 10 inch in size, illustrating construction, finish, color, and texture.
- H. Maintenance Data: Include instructions for repair of minor scratches and damage.
- I. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer; include detailed terms of warranty.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products of the type specified in this section, with not less than three years of documented experience.
- B. Installer Qualifications: Company specializing in installing products of the type specified in this section with not less than three years of documented experience.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Mark doors with location of installation, door type, color, and weight.
- B. Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
- C. Store materials in original packaging, under cover, protected from exposure to harmful weather conditions and from direct contact with water.
 - 1. Store at temperature and humidity conditions recommended by manufacturer.
 - 2. Do not use non-vented plastic or canvas shelters.

3. Immediately remove wet wrappers.
- D. Store in position recommended by manufacturer, elevated minimum 4 inches above grade, with minimum 1/4 inches space between doors.

1.7 FIELD CONDITIONS

- A. Do not install doors until structure is enclosed.
- B. Maintain temperature and humidity at manufacturer's recommended levels during and after installation of doors.

1.8 WARRANTY

- A. Provide five (5) year manufacturer warranty covering materials and workmanship, including degradation or failure due to chemical contact.
- C. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch (6.4 mm) in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
 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 for 2 years from date of Substantial Completion:

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Molded Fiberglass Doors: Entry and Storeroom Doors
 1. Basis of Design for Balcony Doors and Sidelights: Therma-tru Smooth Star Hinged Patio Door, Tru-Guard system, PrismaGuard Premium paint with clear insulated, tempered Low-E glass.
 2. Other approved manufacturer's if they meet the basis of design:
 - a. Warminster Fiberglass: www.warminsterfiberglass.com.
 - b. Jeldwen Windows and Doors.

2.2 DOOR AND FRAME ASSEMBLIES

- A. Door and Frame Assemblies: Factory-fabricated, prepared and machined for hardware.
 1. Door and frame pre-assembled, complete with hinges; shipped with braces, spreaders, and packaging to prevent damage.
 2. Mechanical Durability: Tested to ANSI A250.4 Level A (1,000,000 cycles), minimum; tested with hardware and fasteners intended for use on project.
 3. Screw-Holding Capacity: Tested to 900 psi, minimum.
 4. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less; when tested in accordance with ASTM E 84.
 5. Flammability: Self-extinguishing when tested in accordance with ASTM D 635.
 6. Clearance Between Door and Frame: 1/8-inch, maximum.
 7. Clearance Between Meeting Stiles of Pairs of Doors: 1/8-inch, maximum.
 8. Clearance Between Bottom of Door and Finished Floor: 3/4-inch, maximum; not less than 1/4-inch clearance to threshold.

2.3 COMPONENTS

- A. Doors: Through-color gel coating on fiberglass reinforced polyester resin construction with reinforced core.
 1. Thickness: 1-3/4 inches, overall.
 2. Door Construction: Molded in one piece including gel coating on all sides; manufacturer's standard subframe, core and faces fused during cure in mold; hardware reinforcements
 3. Subframe and Reinforcements: Manufacturer's standard materials.
 4. Waterproof Integrity: All edges, cut-outs, and hardware preparations factory fabricated of fiberglass reinforced plastic; provide cut-outs with joints sealed independently of glazing or louver inserts or trim.

5. Hardware Preparations: Factory reinforce, machine, and prepare for all hardware including field installed items; provide solid blocking for each hardware item; make field cutting, drilling or tapping unnecessary; obtain manufacturer's templates for hardware preparations.
 6. Gel Coating: Ultraviolet stabilized polyester, with flat surface for painting.
 7. Gel Coating Thickness: Minimum 15 mils wet, plus/minus 3 mils.
 8. Primer: Aliphatic urethane for field finishing.
- B. Frames: Profiles and dimensions as indicated on drawings; same type and construction used in mechanical durability test for doors.
1. Construction for Non-Fire-Rated Doors: Use one of the following:
 2. Corner Joints: Mitered with concealed corner blocks or angles of same material as frame; fiberglass and aluminum joined with screws; steel and stainless-steel spot welded; sealed watertight with silicone sealant.
 3. At hardware cut-outs provide continuous backing or mortar guards of same material as frame, sealed watertight.
 4. Frame Anchors: Stainless steel, Type 304; provide 3 anchors in each jamb for heights up to 84 inches with one additional anchor for each additional 24 inches in height.
 5. Provide Exterior Brick-Mold to be field painted and interior trim.
- C. Hinge and Hardware Fasteners: Stainless steel, Type 304; wood screws.

2.4 ACCESSORIES

- A. Astragals for Inactive Leaves: Pultruded fiberglass angle or tee; same color as gel coat.
- B. Glazing and Louver Stops: Pultruded fiberglass unless otherwise indicated or required by fire rating; provided by door manufacturer to fit factory made openings, color and texture to match door; fasteners not penetrating waterproof integrity.
1. Exterior Doors: Provide non-removable stops on outside and continuous compression gasket weatherseal.
 2. Glazed Openings: Provide removable stops on one side.
 3. Opening Sizes: As indicated on drawings.
 4. Insulated Tempered Glazing with Low-E coating
- C. Hardware:
1. Hinges: manf. standard.
 2. Locksets: manf. standard.
 3. Weatherstripping: manf. standard.
- D. Thresholds: Pultruded fiberglass, with skid resistant surface, full width of door opening, 1/2 inch high by 6 inches wide; same color as frame.
- E. Accessible Ramp: Safepath EZ Edge Threshold Ramp

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify actual dimensions of openings by field measurements before door fabrication; show recorded measurements on shop drawings.
- B. Do not begin installation until substrates have been properly prepared.

3.2 PREPARATION

- A. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Clean and prepare substrate in accordance with manufacturer's directions.
- C. Protect adjacent work and finish surfaces from damage during installation.

3.3 INSTALLATION

- A. Install in accordance with manufacturer's instructions; do not penetrate frames with anchors.
- B. Set units plumb, level, and true-to-line, without warping or racking doors, and with specified clearances; anchor in place.

- C. In stud walls, install frames prior to building walls; anchor frames to studs using concealed anchors.
- D. Separate aluminum and other metal surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

3.4 ADJUSTING

- A. Lubricate, test, and adjust doors to operate easily, free from warp, twist or distortion, and to fit watertight for entire perimeter.
- B. Adjust hardware for smooth and quiet operation.
- C. Adjust doors to fit snugly and close without sticking or binding.

3.5 CLEANING

- A. Clean installed products in accordance with manufacturer's instructions prior to owner's acceptance.

3.6 PROTECTION

- A. Protect installed products from damage during subsequent work.

END OF SECTION 08 1613

**SECTION 08 3113
ACCESS DOORS AND FRAMES**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of Contract, including General and Special Conditions and Division 1 – Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section includes access doors and frames.

1.3 ACTION SUBMITTALS

- A. Product Data: Include, finishes, and fire ratings (if required) for access doors and frames.
- B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, details, and attachments to other Work.
- C. Schedule: Provide complete door and frame schedule, including types, general locations, sizes, construction details, latching or locking provisions, and other data pertinent to installation.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain doors and frames through one source from a single manufacturer.
- B. Fire-Rated Access Doors and Frames: Units complying with NFPA 80 and tested for fire-test-response characteristics and that are labeled and listed by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction:
 - 1. NFPA 252 or UL 1013 for vertical access doors.
 - 2. ASTM E 119 or UL 263 for horizontal access doors and frames.
- C. Size Variations: Obtain Architect's acceptance of manufacturer's standard-size units.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- A. J. L. Industries
- B. Larsen Manufacturing
- C. Milcor

2.2 MATERIALS

- A. Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Hot-Rolled Steel Sheets: ASTM A 569/A 569M, Commercial Steel (CS), Type B.
- C. Cold-Rolled Steel Sheets: Provide one of the following:
 - 1. ASTM A 366/A 366M, Commercial Steel (CS),
 - 2. ASTM A 620/A 620M, Drawing Steel (DS), Type B;
 - 3. ASTM A 591/A 591M, Class C coating Electrolytic zinc-coated steel sheet
- D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B, A60 zinc-iron-alloy (galvannealed) coating or G60 mill-phosphatized zinc coating;
- E. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666, Type 304; with minimum sheet thickness indicated representing specified thickness according to ASTM A 480/A 480M.
- F. Drywall Beads: 0.0299-inch zinc-coated steel sheet sized for thickness of gypsum board.

2.3 PAINT

- A. Shop Primer for Metallic-Coated Steel: Organic zinc-rich primer complying with SSPC-Paint 20 and compatible with topcoat.
- B. Galvanizing Repair Paint: High-zinc-dust-content paint for regalvanizing welds in steel, complying with SSPC-Paint 20.

2.4 ACCESS DOORS AND FRAMES

- A. Flush, Insulated, Fire-Rated Access Doors and Frames with Exposed Trim: Fabricated from metallic-coated steel sheet.
 - 1. Locations: Masonry or ceramic-tile wall surfaces.

2. Fire-Resistance Rating: Equal to that of adjacent construction.
 3. Door: 0.075-inch- thick steel, flush construction, insulated.
 4. Frame: 0.060-inch- thick steel with surface-mounted trim.
 5. Hinges: Concealed pin type.
 6. Automatic Closer: Spring type.
 7. Latch: Screwdriver-operated cam latch, except as noted below.
- B. Locking Devices:
1. Provide cylinder locks where exposed to public. Keying shall comply with the Owner's requirements

2.5 FABRICATION

- A. Grind exposed welds smooth and flush with adjacent surfaces.
- B. Furnish attachment devices and fasteners of type required to secure access panels.
- C. Exposed Flanges: Nominal 1 to 1-1/2 inches wide around perimeter of frame.
- D. For trimless frames with drywall bead for installation in gypsum board assembly, provide edge trim for gypsum board securely attached to perimeter of frames.
- E. Provide mounting holes in frames to attach frames to metal or wood framing in plaster and drywall construction and to attach masonry anchors in masonry construction. Furnish adjustable metal masonry anchors.
- F. Latching Mechanisms: Furnish number required to hold doors in flush, smooth plane when closed.

2.6 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Finish metal fabrications after assembly.

2.7 STEEL FINISHES

- A. Apply shop primer to uncoated metal surfaces per SSPC-PA 1, "Paint Application Specification No. 1," for shop painting.
- B. Finish: Field-painted according to Section 09 9000 for interior primed ferrous metals.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coordinate locations of access doors with other trades requiring them.
- B. Comply with manufacturer's written instructions for installing access doors and frames.
- C. Set frames accurately in position and attach securely to supports with plane of face panels aligned with adjacent finish surfaces.
- D. Install access doors with trimless frames flush with adjacent finish surfaces or recessed to receive finish material.

END OF SECTION 08 3113

**SECTION 08 3313
COILING COUNTER DOORS**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Non-fire-rated coiling counter doors and operating hardware.

1.2 REFERENCE STANDARDS

- A. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2008.
- B. ASTM B 221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes Metric; 2007.

1.3 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Submit manufacturer's standard literature showing materials and details of construction and finish. Include data on electrical operation.
- C. Shop Drawings: Indicate rough and actual opening dimensions, anchorage methods, hardware locations, and installation details.
- D. Samples: Submit two slats, 4 inches long illustrating shape, color and finish texture.
- E. Manufacturer's Instructions: Indicate installation sequence and installation, adjustment, and alignment procedures.
- F. Operation and Maintenance Data: Indicate modes of operation, lubrication requirements and frequency, and periodic adjustments required.

PART 2 PRODUCTS

2.1 COILING COUNTER DOORS

- A. Coiling Counter Doors, Non-Fire-Rated: Aluminum slat curtain.
 - 1. Mounting: Exterior face mounted.
 - 2. Nominal Slat Size: 1-1/4 inches wide.
 - 3. Slat Profile: Solid.
 - 4. Finish: Anodized.
 - 5. Guides: Formed track; same material and finish unless otherwise indicated.
 - 6. Hood: Manufacturer's standard;.
 - 7. Operation: Manual hand crank lift operation.
 - 8. Interior latch with padlock hasp.
 - 9. Provide hook to pull door to closing position. Provide mounting bracket for hook storage.

2.2 MATERIALS

- A. Curtain Construction: Interlocking, single thickness slats.
 - 1. Slat Ends: Alternate slats fitted with end locks to act as wearing surface in guides and to prevent lateral movement.
 - 2. Curtain Bottom: Fitted with angles to provide reinforcement and positive contact in closed position.
 - 3. Aluminum Slats: ASTM B 221 (ASTM B 221M), aluminum alloy Type 6063; minimum thickness 0.05 inch.
- B. Guide Construction: Continuous, of profile to retain door in place, with mounting brackets of same metal.
 - 1. Aluminum Guides: Extruded aluminum channel, with wool pile runners along inside.
- C. Hood Enclosure: Internally reinforced to maintain rigidity and shape.
- D. Latching: Inside mounted, sliding deadbolt.
- E. Roller Shaft Counterbalance: Steel pipe and torsion steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb nominal force to operate.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that opening sizes, tolerances and conditions are acceptable.

3.2 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.
- C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.
- D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

3.3 TOLERANCES

- A. Maintain dimensional tolerances and alignment with adjacent work.
- B. Maximum Variation From Plumb: 1/16 inch.
- C. Maximum Variation From Level: 1/16 inch.
- D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft straight edge.

3.4 ADJUSTING

- A. Adjust operating assemblies for smooth and noiseless operation.

3.5 CLEANING

- A. Clean installed components.
- B. Remove labels and visible markings.

END OF SECTION

SECTION 08 4229

INFRARED "TOUCHLESS" SWITCHED FOR AUTOMATIC 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.
- B. **SUMMARY**

This Section includes the following types of automatic door operators – replacement of wall mounted push pad activation devices with Infrared "Touchless" actuation devices.

 - a. Existing automatic door operators are configured for doors as Single Swing Doors.

1.2 REFERENCES

- A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.
- B. Underwriters Laboratories (UL):
 - 1. UL 325 – Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems.
 - 2. UL 10C – Positive Pressure Fire Tests of Door Assemblies
- C. American National Standards Institute (ANSI)/Builders' Hardware Manufacturers Association (BHMA):
 - 1. ANSI/BHMA A156.10: Standard for Power Operated Pedestrian Doors.
- D. American Society for Testing and Materials (ASTM):
 - 1. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
 - 2. ASTM B209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- E. American Association of Automatic Door Manufacturers (AAADM).
- F. International Code Council (ICC):
 - 1. IBC: International Building Code
- G. Building Officials and Code Administrators International (BOCA), 1999.
- H. International Standards Organization (ISO):
 - 1. ISO 9001 - Standard for Manufacturing Quality Management Systems
- I. National Association of Architectural Metal Manufacturers (NAAMM):
 - 1. Metal Finishes Manual for Architectural and Metal Products.
- J. Activation Device: Device that, when actuated, sends an electrical signal to the door operator to open the door.

1.3 REQUIREMENTS

- A. Remove mounted push pad activation devices.
- B. Install wall mounted Infrared "Touchless" actuation devices.
- C. Ensure Compatibility and operation with existing automatic opening devices and system.

1.4 SUBMITTALS

- A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 01 submittal procedures.
- B. Shop Drawings: Include plans, elevations, sections, details, hardware mounting heights, and attachments to other work. Indicate wiring for electrical supply.
- C. Color Samples for selection of factory-applied color finishes.
- D. Closeout Submittals: Provide the following with project close-out documents.
 - 1. Owner's Manual.
 - 2. Warranties.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative, with certificate issued by AAADM, who is trained for installation and maintenance of units required for this Project.
- B. Manufacturer Qualifications: A qualified manufacturer with a manufacturing facility certified under ISO 9001.
- C. Certifications: Wall mounted "no touch" automatic door opener device shall be certified by the manufacturer to meet performance design criteria in accordance with the following standards:
 - 1. ANSI/BHMA A156.10.
 - 2. NFPA 101.
 - 3. UL 325 Listed.
 - 4. UL 10C Listed.
 - 5. IBC 2009 and 2012.
 - 6. BOCA.
- D. Source Limitations: Obtain automatic door operators through one source from a single manufacturer.
- E. Product Options: Drawings indicate sizes, profiles, and dimensional requirements of swinging doors equipped with automatic door operators and are based on the specific system indicated. Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.
- F. Power Operated Door Standard: Existing.
- G. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6 PROJECT CONDITIONS

- A. Field Verify: Contractor shall verify existing field conditions of doors and operators to receive wall mounted activation devices before creating Shop Drawings and fabrication.
- B. Mounting Surfaces: Contractor shall verify all surfaces to be plumb, straight and secure; substrates to be of proper dimension and material.
- C. Other trades: Contractor to advise Construction Manager any inadequate conditions or equipment prior to start of work.

1.7 COORDINATION

- A. Electrical System Roughing-in: Coordinate existing automatic door operators and connections to, power supplies, electric door latching hardware and new wall mounted "no touch" activation devices.
- B. System Integration: Integrate automatic door operators with other systems as required for a complete working installation. Where required for proper operation, provide a time delay relay to signal automatic door operator to activate only after electric lock system is released.

1.8 WARRANTY

- A. Automatic door operators shall be free of defects in material and workmanship for a period of one (1) year from the date of substantial completion.
- B. During the warranty period the Owner shall engage a factory-trained technician to perform service and affect repairs. A safety inspection shall be performed after each adjustment or repair and a completed inspection form shall be submitted to the Owner.
- C. During the warranty period all warranty work, including but not limited to emergency service, shall be performed during normal working hours.

PART 2 - PRODUCTS

2.1 AUTOMATIC DOOR OPERATORS

- A. Basis of design: MS Sedco 216 Series Infrared “touchless” Switches with 1 ½” self-sticking mylar decal.

PART 3 - EXECUTION

3.1 INSPECTION

- A. Examine conditions, with Installer present, for compliance with requirements for installation. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. General: Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion. Rigidly secure non-movement joints.
- B. Mounting: Install Infrared: touchless” Switches plumb and true in alignment with established lines and grades. Anchor securely in place.
 - 1. Install surface-mounted hardware using concealed fasteners to greatest extent possible.
- C. Infrared: Touchless” Switches: Connect to door operators and electrical power distribution system as specified in Division 26 Sections.

3.3 FIELD QUALITY CONTROL

- A. Testing Services: Factory Trained Installer shall test and inspect each swinging automatic entrance door to determine compliance of installed systems with applicable ANSI standards.

3.4 ADJUSTING

- A. Adjust door operators, controls, and hardware for smooth and safe operation, for tight closure, and complying with requirements in ANSI/BHMA A156.10 by AAADM Certified Technician.

3.5 CLEANING AND PROTECTION

- A. Clean surfaces promptly after installation. Remove excess sealant compounds, dirt, and other substances. Repair damaged finish to match original finish.

END OF SECTION 08 7113

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**SECTION 08 7100
DOOR HARDWARE**

PART 1 GENERAL

1.1 RELATED REQUIREMENTS

- A. Section 08 0500 – Basic Materials and Methods: Openings

1.2 REFERENCE STANDARDS

- A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; current edition.
- B. Builders Hardware Manufacturers Association, Inc.
 - 1. BHMA A156.1 - American National Standard for Butts and Hinges; Builders Hardware Manufacturers Association, Inc.
 - 2. BHMA A156.2 - American National Standard for Bored and Preamsembled Locks & Latches; Builders Hardware Manufacturers Association.
 - 3. BHMA A156.3 - American National Standard for Exit Devices; Builders Hardware Manufacturers Association.
 - 4. BHMA A156.4 - American National Standard for Door Controls - Closers; Builders Hardware Manufacturers Association, Inc.
 - 5. BHMA A156.7 - American National Standard for Template Hinge Dimensions; Builders Hardware Manufacturers Association.
 - 6. BHMA A156.8 - American National Standard for Door Controls - Overhead Stops and Holders; Builders Hardware Manufacturers Association, Inc.
 - 7. BHMA A156.13 - American National Standard for Mortise Locks & Latches Series 1000; Builders Hardware Manufacturers Association
 - 8. BHMA A156.18 - American National Standard for Materials and Finishes; Builders Hardware Manufacturers Association, Inc.
 - 9. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems, Builders Hardware Manufacturers Association.
- C. National Fire Protection Association:
 - 1. NFPA 80 - Standard for Fire Doors and Other Opening Protectives.
 - 2. NFPA 101 - Life Safety Code; National Fire Protection Association
- D. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.

1.3 ADMINISTRATIVE REQUIREMENTS

- A. Furnish templates for door and frame preparation to manufacturers and fabricators of products requiring internal reinforcement for door hardware.
- B. Meet with the Owner to verify keying requirements.
- C. Preinstallation Meeting: Convene a preinstallation meeting one week prior to commencing work of this section; require attendance by all affected installers.
- D. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.4 SUBMITTALS

- A. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project.
- B. Hardware Schedule: Detailed listing of each item of hardware to be installed on each door. Use door numbering scheme as included in the Contract Documents. Identify electrically operated items and include power requirements.
- C. Warranty: Submit manufacturer's warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.5 QUALITY ASSURANCE

- A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Source Limitation: Provide all items of a single type by the same manufacturer.
- C. Provide products that comply with the following:

1. Applicable provisions of federal, state, and local codes.
 2. ADA Standards for Accessible Design.
 3. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
 4. Applicable provisions of NFPA 101, Life Safety Code.
 5. Fire-Rated Doors: NFPA 80.
 6. All Hardware on Fire-Rated Doors: Listed and classified by UL as suitable for the purpose specified and indicated.
 7. Hardware for Smoke and Draft Control Doors: Provide hardware that enables door assembly to comply with air leakage requirements of the applicable code.
- D. Function: Lock and latch function numbers and descriptions of manufactures series as listed in hardware schedule.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Package hardware items individually; label and identify each package with door opening code to match hardware schedule.

PART 2 PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Where fire-rated assemblies are required, provide appropriate fire-rated hardware.

2.2 DOOR HARDWARE - GENERAL

- A. Provide all hardware specified or required to make doors fully functional, compliant with applicable codes, and secure to the extent indicated.
- B. Source Limitation: Provide all items of a single type by the same manufacturer.
- C. Provide products that comply with the following:
1. Applicable provisions of federal, state, and local codes.
 2. ANSI/ICC A117.1, American National Standard for Accessible and Usable Buildings and Facilities.
 3. Applicable provisions of NFPA 101, Life Safety Code.
 4. Fire-Rated Doors: NFPA 80.
- D. Function: Lock and latch function numbers and descriptions of manufactures series as listed in hardware schedule.
- E. Finishes: chrome.
- F. Fasteners:
1. Mineral Core Wood Doors: Sex bolts.
 2. Concrete and Masonry Substrates: Stainless steel machine screws and lead expansion shields.

2.3 HINGES

- A. Hinges: Provide hinges on every swinging door.
1. Provide five-knuckle full mortise butt hinges unless otherwise indicated.
 2. Provide ball-bearing hinges at all doors having closers.
 3. Dimensions: 4-1/2 inches x 4-1/2 inches for doors 1-3/4" thick and radiused 3-1/2" x 3-1/2" hinges for doors 1-3/8" thick.
- B. Butt Hinges: Comply with BHMA A156.1 and A156.7; standard weight, unless otherwise indicated.
1. Provide hinge width required to clear surrounding trim.
- C. Quantity of Hinges Per Door:
1. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.
 2. Doors 90 inches (2.3 m) High up to 120 inches (3 m) High: Four hinges.
- D. Basis of Design, Ball-Bearing Butts:
1. 1-3/4" Thick Doors: McKinney TA2714 or TA2317(stainless steel w/stainless steel pins).
 2. 1-3/8" Thick Doors: McKinney 1458

2.4 CLOSERS

- A. BHMA A156.4; rack-and-pinion hydraulic type with adjustable sweep and latch speeds controlled by key-operated valves and forged-steel main arm. Comply with manufacturer's written recommendations for size of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Provide factory-sized closers, adjustable to meet field conditions and requirements for opening force.
- B. Provide exterior rated closers for all door on the exterior of the building.
- C. Basis of Design, Closers:
 - 1. Unit Entry Doors: Norton 1700

2.5 LOCKS AND LATCHES

- A. All locks and latches shall be furnished with standard wrought box strikes.
- B. Cylindrical (bored locks) BHMA A156.2; Grade 1, Series 4000.
 - 1. Provide cylindrical locks for interior doors as scheduled.
 - 2. Lock/latch brands shall match existing and be keyed according to the Housing Authority's existing system.
- C. Trim: Levers shall meet ANSI/ICC A117.1 requirements.
- D. Lock functions are indicated on the Door and Frame Schedule.

2.6 LOCK CORES AND KEYING

- A. Key to Owner's existing system.
- B. Reuse existing Interchangeable lock cores.
- C. Lock Cylinders: Manufacturer's standard tumbler type, Falcon seven-pin core in deadbolt.

2.7 STOPS

- A. Wall Stops: BHMA A156.16; aluminum base metal.
- B. Provide convex wall stops for each door leaf.
- C. Basis of Design: Wall stop: Rockwood 409

2.8 GASKETING AND SILENCERS

- A. Fire and Smoke Gasketing: Intumescent batwing style. self-adhesive
 - 1. Basis of Design: Pemko HSS2000xS44 Smoke Seal
- B. Door Silencers: Gray rubber for pre-drilled frame application.
 - 1. Basis of Design: Rockwood 608

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that doors and frames are ready to receive work; labeled, fire-rated doors and frames are present and properly installed, and dimensions are as indicated on shop drawings.

3.2 INSTALLATION

- A. Install hardware in accordance with manufacturer's instructions and applicable codes.
- B. Use templates provided by hardware item manufacturer.
- C. Install hardware on fire-rated doors and frames in accordance with code and NFPA 80.
- D. Mounting heights for hardware from finished floor to center line of hardware item: As listed in Schedule, unless otherwise noted.

3.3 ADJUSTING

- A. Adjust hardware for smooth operation.
- B. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.4 CLEANING

- A. Clean adjacent surfaces soiled by hardware installation. Clean finished hardware per manufacturer's instructions after final adjustments has been made. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.5 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 Execution Requirements.

3.6 DOOR HARDWARE SCHEDULE

Common Area Doors:

Set A: Trash Room Door

3 Standard weight hinges, 4-1/2" x 4-1/2", Non-rising pins.
1 Closer, interior type
1 Electric strike
1 Automatic door operator
1 Door contact
1 Wall stop
3 Silencers
2 half height door protection

Set B: Mailroom, Community Room and Library

3 Ball-bearing butts, standard weight, 4-1/2" x 4-1/2", non-rising pins.
1 Closer, interior type
1 Classroom lock
1 Lock core
1 Wall stop
3 Silencers

Set C: Men and Women Restroom

3 Ball-bearing butts, standard weight, 4-1/2" x 4-1/2", non-rising pins.
1 Closer, interior type
1 Privacy lock
1 Lock core
1 Wall stop
3 Silencers

Set D: Stairs

1 Passage lock
All other hardware is existing.

Set E: Kitchen Storage Door 121/1

6 Standard weight hinges, 4-1/2" x 4-1/2", non-rising pins.
1 Storeroom lock
1 Lock core
1 Dummy Trim
3 Silencers

Set F: Vestibule

3 Touchless Sensors
All other hardware is existing.

Unit Doors:

Set G: Entry - New

3 Ball-bearing butts, standard weight, 4-1/2" x 4-1/2", non-removable pins.
1 Closer, interior type
1 Entrance lock
1 Lock core

1 Knocker/Viewer
1 Wall stop
3 Silencers
17' Smoke Seal

Set H: Balcony Door - New

3 Ball-bearing butts, standard weight, 4-1/2" x 4-1/2", non-removable pins.
1 Patio lock
1 Lock core
3 Silencers
1 ADA threshold
1 Threshold ramp
Gasketing

Set I: Bathroom Door

1 Privacy latch
1 Wall stop (Where latch sets will contact intersecting walls)
1 Mop plate (Interior side)
1 Kick Plates
Hinges are provided with pre-hung doors.

Set J: Bedroom Door

1 Privacy latch
1 Wall stop
2 Kick Plates
Hinges are provided with pre-hung doors.

Set K: Single Swing Closet Door

1 Passage latch
1 Wall stop (Where latch sets will contact intersecting walls)
2 Kick Plates
Hinges are provided with pre-hung doors.

Set L: Pr. Swing Closet Door

1 Passage latch
1 Dummy Trim
1 Wall stop (Where latch sets will contact intersecting walls)
2 Kick Plates
Hinges are provided with pre-hung doors.

****Note: Provide ADA threshold at accessible units.**

END OF SECTION 08 7100

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**SECTION 09 0500
BASIC MATERIALS AND METHODS: FINISHES**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes general requirements for performance of finishes work in accordance with the Contract Documents.

1.2 REFERENCES

- A. General: Section 01 4219 – Reference Standards.
- B. Comply with applicable provisions of standards referenced, edition in effect as of date of Contract, unless more stringent requirements are required by governing codes, laws, and ordinances, or other Specification Sections.

1.3 SUBMITTALS

- A. General: Refer to Section 01 3000 – Administrative Requirements: For submittal requirements.
- B. Samples: Submit samples in accordance with requirements of each Section. Submit in sufficient size and quantity to demonstrate normal variations in color and texture, and as follows:
 - 1. Samples for Selection Purposes.
 - 2. Samples for Verification Purposes.
 - 3. Samples to demonstrate proper matching characteristics.
- C. Maintenance Instructions for installed products: Submit at Contract closeout.

1.4 QUALITY REQUIREMENTS

- A. Source Limitations: Ensure that each type of product is produced by a single manufacturer and obtained through distribution sources authorized by the manufacturer of each product required, unless otherwise approved by the Architect.
- B. Representative Construction: Construct mock-ups and field samples in accordance with the requirements of applicable Sections.

PART 2 PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Section 01 6000 – Product Requirements and subsequent Division 09 Sections.

PART 3 EXECUTION

3.1 EXECUTION, GENERAL

- A. Refer to Section 01 7000 – Execution Requirements and subsequent Division 09 Sections.

3.2 EXAMINATION

- A. Review the condition of the area of installation and verify that it is acceptable in accordance with the product manufacturer's instructions, referenced standards, and accepted trade practices. Report unfavorable conditions in writing to the Architect. Do not allow installation to proceed until all unsatisfactory conditions have been corrected. Commencing work in an area will be considered acceptance of the existing conditions by that Installer and the Contractor shall assume all responsibility therefore.
- B. Test substrates in accordance with specified testing procedures specified in subsequent Sections and as recommended by manufacturers.

3.3 PREPARATION

- A. Prepare materials for installation in accordance with referenced industry standards, manufacturer's instructions, and accepted trade practices. In exposed or finish work, mix or

arrange materials for uniform blending and optimum arrangement according to the Architect's instructions.

- B. Lay out work in advance to ensure accurate spacing of surface patterns with uniform joint thicknesses and for accurate location of openings, joints, returns, and offsets.
- C. Furnish items to be installed or built into work performed by other trades according to the project schedule so as not to cause delays.
- D. Surface Preparation:
 - 1. Furnish, install, maintain, and remove all necessary temporary protections to safeguard persons and property in the vicinity of the surface preparation area prior to commencement of surface preparation procedures, including but not limited to protection of HVAC system and existing adjacent construction.
 - 2. Prepare surfaces to receive work in accordance with manufacturer's instructions, referenced standards and accepted trade practices.
 - 3. Test substrates according to standard industry practices approved by the manufacturer of the components to be installed. Perform additional testing as recommended by the manufacturer.

3.4 EXECUTION, GENERAL

- A. All work identified in the Contract Documents shall be performed by skilled and, where applicable, by licensed installers. Where indicated in the Contract Documents, installers shall be approved by the manufacturer for installing the materials in the manner indicated.
- B. The Work shall be installed, applied, or erected in accordance with recognized trade practices, unless more stringent installation requirements are described in the Contract Documents or in the approved manufacturer's published installation instructions. For materials or systems that are specified to receive warranties, work shall comply with the requirements of the manufacturer.
- C. Perform all cutting and patching required for full execution of the work. Patching of finished materials shall be performed by skilled installers in a manner that fully restores the finished work to a condition acceptable to the Architect.
- D. Construct work to the full elevations, widths, and thicknesses shown.

3.5 INSPECTION

- A. When required by authorities having jurisdiction over the Project, the Contractor shall schedule and oversee inspections and testing of the installed work and respond to all recommendations that arise therefrom.
- B. When review and inspection of work by a manufacturer representative is a condition of a special project warranty, the Contractor shall schedule and oversee such reviews and inspections and respond to all recommendations that arise therefrom.

3.6 CLEANING

- A. Progress Cleaning: As the Work progresses, the Contractor shall ensure that installed products are cleaned in accordance with the recommendations of the product manufacturer, referenced standards, and accepted trade practices.

3.7 FINISHING

- A. Finish surfaces of installed work that are not pre-finished by the manufacturer or fabricator, including but not limited to metal, wood, and cementitious elements.
 - 1. Finishing includes, as applicable, sealing joints between frames and substrates, surface preparation, priming and painting or staining and sealing in accordance with the manufacturer's recommendations and the Owner's finish scheme.
 - 2. Final color and sheen will be selected by the Architect.
 - 3. Do not conceal or paint over labels or tags required by authorities having jurisdiction when performing finish work.
 - 4. Refer to Section 09 9000 for additional finishing requirements.
- B. Back-prime and weather-proof components installed as part of building shell construction.

3.8 PROTECTION

- A. Provide necessary protections to ensure that installed products are without damage or undue deterioration as of the Project Completion Date. Upon final acceptance of the work, the remove temporary protections from the Project Site.

END OF SECTION 09 0500

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**SECTION 09 0561
COMMON WORK RESULTS FOR FLOORING PREPARATION**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. This section applies to all floors identified in the contract documents as to receive the following types of floor coverings:
 - 1. Resilient tile
- B. Removal of existing floor coverings.

1.2 RELATED REQUIREMENTS

- A. Section 09 0500 – Basic Materials and Methods: Finishes

1.3 REFERENCES

- A. ASTM F710 - Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- B. ASTM F1869 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.
- C. RFCI (RWP) - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Coordinate scheduling of cleaning and testing, so that preliminary cleaning has been completed for at least 24 hours prior to testing.

1.5 SUBMITTALS

- A. Visual Observation Report: For existing floor coverings to be removed.
- B. Copy of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
- C. Remedial Materials Product Data: Manufacturer's published data on each product to be used for remediation.
 - 1. Manufacturer's qualification statement.
 - 2. Test reports indicating compliance with specified performance requirements, performed by nationally recognized independent testing agency.
 - 3. Manufacturer's installation instructions.
 - 4. Specimen Warranty: Copy of warranty to be issued by coating manufacturer and certificate of underwriter's coverage of warranty.

1.6 FIELD CONDITIONS

- A. Maintain ambient temperature in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 65 degrees F (18 degrees C) or more than 85 degrees F (30 degrees C).
- B. Maintain relative humidity in spaces where concrete testing is being performed, and for at least 48 hours prior to testing, at not less than 40 percent and not more than 60 percent.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Patching Compound: Floor covering manufacturer's recommended product, suitable for conditions, and compatible with adhesive and floor covering. In the absence of any recommendation from flooring manufacturer, provide a product with the following characteristics:
 - 1. Cementitious moisture-, mildew-, and alkali-resistant compound, compatible with floor, floor covering, and floor covering adhesive, and capable of being feathered to nothing at edges.
 - 2. Latex or polyvinyl acetate additions are permitted; gypsum content is prohibited.
 - 3. Compressive Strength: 3000 psi, minimum, after 28 days, when tested in accordance with ASTM C109/C109M or ASTM C472, whichever is appropriate.

- B. Remedial Floor Coating: Single- or multi-layer coating or coating/overlay combination intended by its manufacturer to resist water vapor transmission to degree sufficient to meet flooring manufacturer's emission limits, resistant to the level of pH found, and suitable for adhesion of flooring without further treatment.
 - 1. Thickness: 1/8 inch (3 mm), maximum.
 - 2. If testing agency recommends any particular products, use one of those.

PART 3 EXECUTION

3.1 REMOVAL OF EXISTING FLOOR COVERINGS

- A. Comply with local, State, and federal regulations and recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings, as applicable to floor covering being removed.
- B. Dispose of removed materials in accordance with local, State, and federal regulations and as specified.

3.2 PRELIMINARY CLEANING

- A. Clean floors of dust, solvents, paint, wax, oil, grease, asphalt, residual adhesive, adhesive removers, film-forming curing compounds, sealing compounds, alkaline salts, excessive laitance, mold, mildew, and other materials that might prevent adhesive bond.
- B. Do not use solvents or other chemicals for cleaning.

3.3 PREPARATION

- A. See individual floor covering section(s) for additional requirements.
- B. Comply with requirements and recommendations of floor covering manufacturer.
- C. Fill and smooth surface cracks, grooves, depressions, control joints and other non-moving joints, and other irregularities with patching compound.
- D. Do not fill expansion joints, isolation joints, or other moving joints.

3.4 APPLICATION OF REMEDIAL FLOOR COATING

- A. Comply with requirements and recommendations of coating manufacturer.

3.5 PROTECTION

- A. Cover prepared floors with building paper or other durable covering.

END OF SECTION 09 0561

**SECTION 09 2116
GYPSUM BOARD ASSEMBLIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Performance criteria for gypsum board assemblies.
- B. Gypsum wallboard.
- C. Joint treatment and accessories.

1.2 RELATED REQUIREMENTS

- A. Section 06 1000 - Rough Carpentry

1.3 REFERENCE STANDARDS

- A. ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002 (Reapproved 2007).
- B. ASTM C 514 - Standard Specification for Nails for the Application of Gypsum Board; 2004.
- C. ASTM C 557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003.
- D. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2007.
- E. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2006.
- F. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2007.
- G. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board; 2007.
- H. ASTM C 954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2007.
- I. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2007.
- J. ASTM C 1396/C 1396M - Standard Specification for Gypsum Board; 2006a.
- K. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2005.
- L. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2004.
- M. ASTM E 413 - Classification for Rating Sound Insulation; 2004.
- N. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2007.
- O. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Provide data on gypsum board, accessories, and joint finishing system.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: Company specializing in performing, with minimum 3 years of experience.

PART 2 PRODUCTS

2.1 GYPSUM BOARD ASSEMBLIES

- A. Provide completed assemblies complying with ASTM C 840 and GA-216.
- B. Interior Partitions: Provide completed assemblies with the following characteristics:
 - 1. Acoustic Attenuation: STC of 55-59 calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

2.2 BOARD MATERIALS

- A. Manufacturers - Gypsum-Based Board:
 - 1. American Gypsum: www.americangypsum.com.

2. CertainTeed Corporation: www.certainteed.com.
 3. Georgia-Pacific Gypsum LLC: www.gp.com/gypsum.
 4. National Gypsum Company: www.nationalgypsum.com.
 5. USG Corporation: www.usg.com.
- B. Ceiling Board: Special sag-resistant gypsum ceiling board as defined in ASTM C 1396/C 1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
 2. Thickness: 1/2 inch.
 3. Edges: Tapered.
 4. Products:
 - a. American Gypsum; Interior Ceiling Board.
 - b. CertainTeed Corporation; ProRoc Interior Ceiling.
 - c. Georgia-Pacific Gypsum LLC; ToughRock CD Ceiling Board.
 - d. National Gypsum Company; High Strength Brand Ceiling Board.
 - e. USG Corporation; Sheetrock Brand Sag-Resistant Interior Gypsum Ceiling Board.

2.3 ACCESSORIES

- A. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
1. Tape: 2 inch wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
 2. Tape: 2 inch wide, creased paper tape for joints and corners, except as otherwise indicated.
 3. Ready-mixed vinyl-based joint compound.
 4. Powder-type vinyl-based joint compound.
- B. Screws for Attachment to Wood Members, and to Gypsum Board: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.
- C. Nails for Attachment to Wood Members: ASTM C 514.
- D. Adhesive for Attachment to Wood: ASTM C 557.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that project conditions are appropriate for work of this section to commence.

3.2 BOARD INSTALLATION

- A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.
- B. Single-Layer Non-Rated: Install gypsum board parallel to framing, with ends and edges occurring over firm bearing.
1. Exception: Tapered edges to receive joint treatment at right angles to framing.
- C. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
1. Single-Layer Applications: Adhesive application.
- D. Moisture Protection: Treat cut edges and holes in moisture resistant gypsum board and exterior gypsum soffit board with sealant.

3.3 INSTALLATION OF TRIM AND ACCESSORIES

- A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.
1. Not more than 30 feet apart on walls and ceilings over 50 feet long.
- B. Corner Beads: Install at external corners, using longest practical lengths.
- C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials.

3.4 JOINT TREATMENT

- A. Finish gypsum board in accordance with levels defined in ASTM C 840, as follows:
1. Level 4: Walls and ceilings to receive paint finish or wall coverings, unless otherwise indicated.

2. Level 5: Walls and ceilings to receive semi-gloss or gloss paint finish and other areas specifically indicated.
 3. Level 3: Walls to receive textured wall finish.
 4. Level 2: In utility areas, behind cabinetry, and on backing board to receive tile finish.
 5. Level 1: Fire rated wall areas above finished ceilings, whether or not accessible in the completed construction.
 6. Level 0: Temporary partitions and surfaces indicated to be finished in later stage of project.
- B. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
1. Feather coats of joint compound so that camber is maximum 1/32 inch.
 2. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile and fixed cabinetry.
 3. Taping, filling and sanding is not required at base layer of double layer applications.
- C. Where Level 5 finish is indicated, spray apply high build drywall surface over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.5 TOLERANCES

- A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION 09 2116

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**SECTION 09 5113
ACOUSTICAL TILE CEILINGS**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general conditions of Contract, including General and Supplementary Conditions and Divisions-1 Specification sections apply to work of this section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Acoustical ceiling panels.
 - a. Existing Exposed grid suspension system.
 - 1) Existing Wire hangers, fasteners, main runners, cross tees, and wall angle moldings.

1.3 ALTERNATES

- A. Prior Approval: Unless otherwise provided for in the Contract documents, proposed product substitutions may be submitted no later than TEN (10) working days prior to the date established for receipt of bids.

1.4 REFERENCES

- A. American Society for Testing and Materials (ASTM):
 - 1. ASTM A 1008 Standard Specification for Steel, Sheet, Cold Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
 - a. ASTM A 641 Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire.
 - 1) ASTM A 653 Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process.
 - (a) ASTM C 423 Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.
 - (b) ASTM C 635 Standard Specification for Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.
 - (c) ASTM C 636 Recommended Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.
 - (d) ASTM E 84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - (e) ASTM E 1414 Standard Test Method for Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum.
 - (f) ASTM E 1111 Standard Test Method for Measuring the Interzone Attenuation of Ceilings Systems.
 - (g) ASTM E 1264 Classification for Acoustical Ceiling Products.
 - (h) ASTM E 1477 Standard Test Method for Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers.
 - (i) ASTM D 3273 Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber.
 - (j) ASTM E 119 Standard Test Methods for Fire Tests of Building Construction and Material.
 - 2. ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

1.5 SUBMITTALS

- A. Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.
 - 1. Samples: Minimum 6 inch x 6 inch samples of specified acoustical panel; 8 inch long samples of exposed wall molding and suspension system, including main runner and 4 foot cross tees.
 - 2. Shop Drawings: Layout and details of acoustical ceilings. Show locations of items which are to be coordinated with, or supported by the ceilings.

3. Certifications: Manufacturer's certifications that products comply with specified requirements, including laboratory reports showing compliance with specified tests and standards. For acoustical performance, each carton of material must carry an approved independent laboratory classification of NRC, CAC, and AC.
4. If the material supplied by the acoustical subcontractor does not have an Underwriter's Laboratory classification of acoustical performance on every carton, subcontractor shall be required to send material from every production run appearing on the job to an independent or NVLAP approved laboratory for testing, at the architect's or owner's discretion. All products not conforming to manufacturer's current published values must be removed, disposed of and replaced with complying product at the expense of the Contractor performing the work.

1.6 QUALITY ASSURANCE

- A. Single-Source Responsibility: Provide acoustical panel units and grid components by a single manufacturer.
 1. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination, and other causes.
 1. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.
 2. Handle acoustical ceiling units carefully to avoid chipping edges or damaged units in any way.

1.8 PROJECT CONDITIONS

- A. Space Enclosure:
 1. All ceiling products and suspension systems must be installed and maintained in accordance with Armstrong written installation instructions for that product in effect at the time of installation and best industry practice. Prior to installation, the ceiling product must be kept clean and dry, in an environment that is between 32oF (0o C) and 120oF (49o C) and not subject to Abnormal Conditions.
 - a. Abnormal conditions include exposure to chemical fumes, vibrations, moisture from conditions such as building leaks or condensation, excessive humidity, or excessive dirt or dust buildup.
 - b. Standard Ceilings: Do not install interior ceilings until space is enclosed and weatherproof; wet work in place is completed and nominally dry; work above ceilings is complete; and ambient conditions of temperature and humidity are continuously maintained at values near those intended for final occupancy. Building areas to receive ceilings shall be free of construction dust and debris.

1.9 WARRANTY

- A. Acoustical Panel: Submit a written warranty executed by the manufacturer, agreeing to repair or replace acoustical panels that fail within the warranty period. Failures include, but are not limited to:
 1. Acoustical Panels: Sagging and warping as a result of defects in materials or factory workmanship.
 - a. Grid System: Rusting and manufacturer's defects
 2. Warranty Period:
 - a. Acoustical panels: Ten (10) year from date of substantial completion.
 - b. Grid: Ten years from date of substantial completion.
 3. The Warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with

other warranties made by the Contractor under the requirements of the Contract Documents.

1.10 MAINTENANCE

- A. Extra Materials: Deliver extra materials to Owner. Furnish extra materials described below that match products installed. Packaged with protective covering for storage and identified with appropriate labels.
 - 1. Acoustical Ceiling Units: Furnish quality of full-size units equal to 5.0 percent of amount installed.
 - 2. Exposed Suspension System Components: Furnish quantity of each exposed suspension component equal to 2.0 percent of amount installed.

PART 2-PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Seismic Performance: Acoustical ceiling shall withstand the effects of earthquake motions determined according to ASCE/SEI 7.
- B. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - 2. Smoke-Developed Index: 50 or less.
- C. Fire-Resistance Ratings: Comply with ASTM E 119; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Indicate design designations from UL's "Fire Resistance Directory" or from the listings of another qualified testing agency.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Low-Emitting Materials: Acoustical panel ceilings shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Recycled Content: Post consumer recycled content plus one-half of pre consumer recycled content not less than 25 percent.
- C. Glass-Fiber-Based Panels: Made with binder containing no urea formaldehyde.
- D. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectance unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface according to ASTM E 795.
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 MANUFACTURERS

- A. USG Ceiling Solutions - Owner's Standard

2.4 ACOUSTICAL CEILING UNITS

- A. Acoustical Panels – Radar Basic, Flat White 050
 - 1. Edge Profile: Square for interface with 15/16" exposed tee grid.
 - 2. Emissions Performance: Section 01350 Protocol, < 13.5 ppb of formaldehyde when used under typical conditions required by ASHRAE Standard 62.1-2004, "Ventilation for Acceptable Indoor Air Quality"

3. Surface-Burning Characteristics: Comply with ASTM E 84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - a. Flame-Spread Index: Comply with ASTM E 1264 for Class A materials.
 - b. Smoke-Developed Index: 50 or less.
- B. Metal grid and Suspension Systems – DX/DXL
 1. Structural Classification: ASTM C 635 Intermediate Duty.
 2. Color: White.
 3. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung.
 4. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
 5. Edge Moldings and Trim: Manufacturer's standard moldings for edges and penetrations, including light fixtures. Provide moldings with exposed flange of the same width as exposed runner.

2.5 SUSPENSION SYSTEMS

- A. Components: All main beams and cross tees shall be commercial quality hot-dipped galvanized (galvanized steel, aluminum, or stainless steel) as per ASTM A 653. Main beams and cross tees are double-web steel construction with type exposed flange design. Exposed surfaces chemically cleansed, capping pre-finished galvanized steel (aluminum or stainless steel) in baked polyester paint. Main beams and cross tees shall have rotary stitching (exception: extruded aluminum or stainless steel).
 1. Structural Classification: ASTM C 635 Intermediate Duty.
 - a. Color: White and match the actual color of the selected ceiling tile, unless noted otherwise.
 2. High Humidity Finish: Comply with ASTM C 635 requirements for Coating Classification for Severe Environment Performance where high humidity finishes are indicated.
 - a. SS Prelude Plus by Armstrong World Industries, Inc. - 100% Type 304 STAINLESS Steel.
 3. Attachment Devices: Size for five times design load indicated in ASTM C 635, Table 1, Direct Hung unless otherwise indicated.
 4. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper, pre-stretched, with a yield stress load of at least three times design load, but not less than 12 gauge.
 5. Edge Moldings and Trim: Metal or extruded aluminum of types and profiles indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations, including light fixtures, that fit type of edge detail and suspension system indicated. Provide moldings with exposed flange of the same width as exposed runner.
 6. Accessories.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Do not proceed with installation until all wet work such as painting has been completed and thoroughly dried out, unless expressly permitted by manufacturer's printed recommendations.

3.2 PREPARATION – Install in existing suspended grid. If necessary to replace grid, then:

- A. Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less than half width units at borders, and comply with reflected ceiling plans. Coordinate panel layout with mechanical and electrical fixtures.
 1. Coordination: Furnish layouts for preset inserts, clips, and other ceiling anchors whose installation is specified in other sections.
 - a. Furnish concrete inserts and similar devices to other trades for installation well in advance of time needed for coordination of other work.

3.3 INSTALLATION – Install in existing suspended grid. If necessary to replace grid, then:

- A. Install suspension system and panels in accordance with the manufacturer's instructions, and in compliance with ASTM C 636 and with the authorities having jurisdiction.

1. Suspend main beam from overhead construction with hanger wires spaced 4'-0" on center along the length of the main runner. Install hanger wires plumb and straight.
2. Install wall moldings at intersection of suspended ceiling and vertical surfaces. Miter corners where wall moldings intersect or install corner caps.
3. For reveal edge panels: Cut and reveal or rabbet edges of ceiling panels at border areas and vertical surfaces.
4. Install acoustical panels in coordination with suspended system, with edges resting on flanges of main runner and cross tees. Cut and fit panels neatly against abutting surfaces. Support edges by wall moldings.

3.4 ADJUSTING AND CLEANING

- A. Replace damaged and broken panels.
 1. Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members. Comply with manufacturer's instructions for cleaning and touch up of minor finish damage.
 - a. Ceiling Grid Paint, (Item #5760, 8oz. bottles) (Item #5761, quart size cans), "global white" latex paint should be used to re-finish surface and to cover field regularized edges that are exposed to view.
 2. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

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**SECTION 09 6500
RESILIENT FLOORING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Resilient plank flooring.
- B. Rubber Treads and Risers
- C. Resilient base.
- D. Installation accessories.

1.2 REFERENCE STANDARDS

- A. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- B. ASTM F1861 - Standard Specification for Resilient Wall Base.
- C. BAAQMD 8-51 - Bay Area Air Quality Management District Regulation 8, Rule 51, Adhesive and Sealant Products.
- D. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association.
- E. RFCI - Recommended Work Practices for Removal of Resilient Floor Coverings; Resilient Floor Covering Institute.

1.3 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.
- B. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.
- C. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Flooring Material: 100 square feet of each type and color.
 - 2. Extra Wall Base: 50 linear feet of each type and color.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Protect materials from damage by storing properly.

1.5 FIELD CONDITIONS

- A. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).
- B. Store materials for not less than 48 hours prior to installation in area of installation at a temperature of 70 degrees F (21 degrees C) to achieve temperature stability. Thereafter, maintain conditions above 55 degrees F (13 degrees C).
- C. Do not install tiles over concrete slabs until slabs have cured, are sufficiently dry to bond with adhesive, are dry from site conditions, and have pH range recommended by flooring manufacturer. No condensation on underside of 4 foot by 4 foot polyethylene sheet within 48 hours, fully taped at perimeters. PH and moisture rates:
 - 1. PH range of 5 to 9.
 - 2. Moisture emission rate of 3 lb./1000 sq.ft. per 24 hours or less.

PART 2 PRODUCTS

2.1 MANUFACTURERS AND PRODUCTS

- A. Refer to the Finish Legend for selected products.

2.2 RESILIENT FLOORING (LVP) - Units

- A. Owner's Standard: SMARTCORE Pro – Luxury Vinyl Plank
 - 1. Substitutions not permitted.
 - 2. Wear Layer Thickness: 20 mil.
 - 3. Slip Resistance: ASTM D 2047, ADA Compliant
 - 4. Size: 7" x 48" plank
 - 5. Installation: Accessible Units: Direct Glue Down

2.3 RESILIENT FLOORING (LVP) – Common Areas

- A. Owner's Standard: Mowhawk Group – Hot and Heavy
 - 1. Substitutions not permitted.
 - 2. Wear Layer Thickness: 20 mil.
 - 3. Slip Resistance: ASTM D 2047, ADA Compliant
 - 4. Size: 9" x 59" plank
 - 5. Installation: Accessible Units: Direct Glue Down

2.4 RESILIENT BASE

- A. Resilient Base: Type TP rubber, thermoplastic rubber; top set Style B, Cove, and as follows:
 - 1. Owner's Standard: Tarkett (Johnsonite), Duracove Thermoplastic Rubber
 - 2. Substitutions not permitted.
 - 3. Height: 4 inch and 6" inch (see finish schedule)
 - 4. Accessories: Premolded external corners and end stops.

2.5 ACCESSORIES

- A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.
- B. Primers, Adhesives, and Seaming Materials: Waterproof; types recommended by flooring manufacturer.
 - 1. Provide only products having lower volatile organic compound (VOC) content than required by the more stringent of the South Coast Air Quality Management District Rule No.1168 and the Bay Area Air Quality Management District Regulation 8, Rule 51.
- C. Moldings, Transition and Edge Strips: Same material as flooring.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.
- B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive base.
- C. Cementitious Sub-floor Surfaces: Verify that substrates are dry enough and ready for resilient flooring installation by testing for moisture and pH.
 - 1. Obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.
- D. Verify that concrete sub-floor surfaces are dry enough and ready for resilient flooring installation by testing for moisture emission rate and alkalinity in accordance with ASTM F710; obtain instructions if test results are not within limits recommended by resilient flooring manufacturer and adhesive materials manufacturer.

3.2 PREPARATION

- A. Remove existing resilient flooring and flooring adhesives; follow the recommendations of RFCI Recommended Work Practices for Removal of Resilient Floor Coverings.
- B. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- C. Remove sub-floor ridges and bumps. Fill minor low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.
- D. Prohibit traffic until filler is cured.
- E. Clean substrate.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install in accordance with manufacturer's instructions.
- C. Spread only enough adhesive to permit installation of materials before initial set.
- D. Fit joints tightly.
- E. Set flooring in place, press with heavy roller to attain full adhesion.

- F. Where type of floor finish, pattern, or color are different on opposite sides of door, terminate flooring under centerline of door.
- G. Install edge strips at unprotected or exposed edges, where flooring terminates, and where indicated.
 - 1. Metal Strips: Attach to substrate before installation of flooring using stainless steel screws.
 - 2. Resilient Strips: Attach to substrate using adhesive.
- H. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

3.4 RESILIENT BASE

- A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.
- B. Install base on solid backing. Bond tightly to wall and floor surfaces.
- C. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

- A. Remove excess adhesive from floor, base, and wall surfaces without damage.
- B. Clean in accordance with manufacturer's instructions.

3.6 PROTECTION

- A. Prohibit traffic on resilient flooring for 48 hours after installation.
- B. Do not allow rolling carts to be used on the floor for at least 72 hours.

END OF SECTION 09 6500

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**SECTION 09 6813
TILE CARPETING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Walk-Off Carpet Tile.

1.2 RELATED REQUIREMENTS

- A. Section 09 0500 – Common Work Results for Finishes

1.3 REFERENCE STANDARDS

- A. ASTM D2859 - Standard Test Method for Ignition Characteristics of Finished Textile Floor Covering Materials.
- B. ASTM E648 - Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source.
- C. CRI (CIS) - Carpet Installation Standard; Carpet and Rug Institute.
- D. CRI (GLA) - Green Label Testing Program - Approved Adhesive Products; Carpet and Rug Institute.
- E. NFPA 253 - Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source; National Fire Protection Association.

1.4 SUBMITTALS

- A. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.
- B. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.
- C. Manufacturer's Installation Instructions: Indicate special procedures.
- D. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning.
- E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
 - 1. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing specified carpet tile with minimum three years documented experience.
- B. Installer Qualifications: Company specializing in installing carpet with minimum five years experience.

1.6 FIELD CONDITIONS

- A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Refer to the Finish Schedule.

2.2 ACCESSORIES

- A. Sub-Floor Filler: White premix latex; type recommended by flooring material manufacturer.
- B. Edge Strips: Embossed aluminum, standard color selected by the Architect.
- C. Adhesives: Acceptable to carpet tile manufacturer, compatible with materials being adhered; maximum VOC of 50 g/L; CRI Green Label certified; in lieu of labeled product, independent test report showing compliance is acceptable.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that sub-floor surfaces are smooth and flat within tolerances specified for that type of work and are ready to receive carpet tile.

- B. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to sub-floor surfaces.

3.2 PREPARATION

- A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.
- B. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler.
- C. Vacuum clean substrate.

3.3 INSTALLATION

- A. Starting installation constitutes acceptance of sub-floor conditions.
- B. Install carpet Pin accordance with manufacturer's instructions and CRI Carpet Installation Standard.
- C. Blend carpet from different cartons to ensure minimal variation in color match.
- D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.
- E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.
- F. Layout: See drawings.
- G. Adhere carpet tile to substrate along centerline of rooms, at perimeter of rooms, where tiles are cut, and at 15 foot (4.5 m) intervals throughout rooms. Lay remainder of tile dry over substrate.
- H. Trim carpet tile neatly at walls and around interruptions.
- I. Complete installation of edge strips, concealing exposed edges.

3.4 CLEANING

- A. Remove excess adhesive without damage, from floor, base, and wall surfaces.
- B. Clean and vacuum carpet surfaces.

END OF SECTION 09 6813

**SECTION 09 9000
PAINTING**

PART 1 GENERAL

1.1 GENERAL CONDITIONS

- A. The General Conditions, Modifications to General Conditions, Supplementary or Special Conditions and any Instructions to Bidders shall apply to all Divisions of the work.
- B. The requirements of State, Local or appropriate codes applicable to the work, whichever is the most stringent is a requirement of all Divisions of the work.

1.2 DEFINITIONS

- A. Standard coating terms defined in ASTM D16 apply to this Section.
- B. Exposed surfaces: Surfaces visible when permanent or built-in items are in place. Extend coatings into these areas to provide desired protection.
- C. Paint: Coating systems materials, primers, emulsions, enamels, stains, sealers and fillers, and other applied materials whether used as prime, intermediate or finish coats.

1.3 SUBMITTALS

- A. Product Data: Submit manufacturer's technical information, label analysis, and application instructions for each paint material proposed for use.
- B. Samples: Submit two representative samples of each major type of surface or material. Do not proceed with final painting until samples are approved.
- C. Color Charts: In duplicate, for all paints, stains and special coatings. Identify with numbers used on Drawings.
- D. Paint Schedule: In a form similar to the schedule herein outlining the type of paint to be used for each category, application, and color. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
- F. Quality Control Submittals:
 - 1. Certifications: Manufacturer's statement that paint materials conform to current regulations relating to lead content and air pollution emission requirements.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Provide primers and undercoat paint produced by the same manufacturer as the finish coats.
- B. Coordination of Work: Review Sections in which primers are provided to ensure compatibility of the total systems for various substrates.
- C. Material Quality: Provide the manufacturer's best quality trade sale type paint material of the various types specified. Proprietary names used to designate colors or materials are not intended to imply that products named are required or to exclude of equal products of other manufacturers.

1.5 DELIVERY AND STORAGE

- A. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg. F. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.
- B. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
- C. Extra Materials
 - 1. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory-sealed containers for storage.
 - a. Quantity: Furnish the Owner with two gallons of each material and color applied in addition to any leftover amounts.
 - b. Label cans with manufacturer's color names and color formula numbers.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Sherwin-Williams(S-W) materials are listed in the Paint Schedule. This is the Owner's standard and substitutions will not be permitted.

2.2 PAINT MATERIALS - GENERAL

- A. Prohibited Content: Raw linseed oil, turpentine, benzene, gloss oil, or coal oil shall not be used in any of the materials for painting work.
- B. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated.
- D. Colors: Refer to the Finish Schedule for the Architect's color selections.

2.3 PROTECTIVE COATINGS

- A. Bituminous Paint: Acid and alkali resistant type conforming to ASTM D1187.
- B. Zinc Chromate Primer: Standard zinc chromate primer, selected from manufacturers listed in this Section.
- C. Aluminum Pigmented Paint: Fibrated aluminum complying with ASTM D2824, Type IV.
- D. Apply protective coating, bituminous paint, to isolate aluminum member as required.

PART 3 EXECUTION

3.1 FIELD CONDITIONS

- A. Do not apply paint when the relative humidity exceeds 85 percent, or at temperatures less than 5 degrees F. above the dew point, or to damp or wet surfaces.

3.2 EXAMINATION

- A. Examine substrates and conditions under which painting will be performed for compliance with requirements. Do not begin application until unsatisfactory conditions have been corrected.
- B. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.

3.3 PREPARATION

- A. Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and items in place that are not to be painted, or provide protection prior to surface preparation and painting. Remove items if necessary for complete painting of the items and adjacent surfaces. Following completion of painting, reinstall items removed using workmen skilled in the trades involved.
- B. Clean surfaces before applying paint or surface treatments. Schedule cleaning and painting so dust and other contaminants will not fall on wet, newly painted surfaces.
- C. Provide protection for adjacent surfaces as necessary to prevent paint from coming into contact with adjacent materials not scheduled for painting.

3.4 SURFACE PREPARATION

- A. Clean and prepare surfaces to be painted in accordance with manufacturer's instructions for each particular substrate condition. Notify Architect in writing of problems anticipated using specified finish coat material with substrates primed by others.
- B. Cementitious Surfaces: Prepare concrete, concrete masonry, cement plaster and similar surfaces to be painted by removing efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze.
- C. Determine alkalinity and moisture content of surfaces to be painted. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
- D. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.

1. Use abrasive blast-cleaning methods if recommended by paint manufacturer.
2. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
3. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
4. At areas to receive epoxy paint, clean concrete with a 5 percent solution of muriatic acid, neutralize with ammonia, rinse, allow to dry before painting, all per manufacturer's recommendations.
5. Ferrous Metals: Clean non-galvanized 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 Society for Protective Coatings (SSPC) <<http://www.sspc.org/>>.
6. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush, clean with solvents, and touch-up with the same primer as the shop coat.
7. At areas to receive epoxy paint, prepare steel surfaces to SSPC <<http://www.sspc.org/>> SP 2 Power Tool Clean.
8. Galvanized Surfaces: Utilize SSPC <<http://www.sspc.org/>>-SP1 Solvent Cleaning and Chemical Wash (tri-sodium phosphate). Power wash with tri-sodium phosphate type cleaner (5% solution at 140 degrees F.) and solvent clean after rinsing and drying with a non-petroleum based solvent cleaner so that surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock, by mechanical methods.
9. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush clean with solvents, and touch-up with the same primer as the shop coat.
10. Wood Surfaces:
 - a. Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - b. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - c. Delete subparagraphs below if these requirements are specified in other Sections.
 - d. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
 - e. When transparent finish is required, backprime with spar varnish.
 - f. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on backside.
 - g. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.

3.5 MATERIALS PREPARATION

- A. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
- B. Mix and prepare paint in accordance with manufacturer's directions.
- C. 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 before using.
- D. Use only thinners approved by manufacturer, and only within recommended limits.

3.6 BLOCK FILLERS

- A. Apply block fillers at a rate to ensure complete coverage with pores filled.

3.7 PRIME COATS

- A. Before applying finish coats, apply a prime coat, as scheduled or if required by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others.
- B. 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.
- C. Tinting of primers to match final coat will not be permitted.
- D. Re-coat primed and sealed substrates where there is evidence of suction spots or unsealed areas in the first coat to assure a finish coat with no burn-through or other defects due to insufficient sealing.
- E. Omit primer on metal surfaces that have been shop-primed, unless primer becomes worn, damaged, or more than six months old from date of delivery to job site.

3.8 APPLICATION

- A. Apply paint in accordance with manufacturer's directions. Use applicators and techniques best suited for substrate and type of material being applied. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
- B. The number of coats and film thickness required is the same regardless of application method. Apply succeeding coats per manufacturer's specifications. Sand between applications where required to produce a smooth, even surface.
- C. Pigmented (Opaque) Finishes:
 - 1. Completely cover surfaces as necessary 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.
 - 2. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 3. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of 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. Tinting of primer to match finish coats will not be permitted.
 - 4. Transparent (Clear) Finishes:
 - a. Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
 - b. Unless otherwise indicated, provide satin finish for final coats.
 - 5. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
 - 6. Paint all edges of every door to match faces, including top and bottoms.
 - 7. Paint all exposed surfaces, whether or not colors are designated, except where a surface or material is indicated not to be painted or is to remain natural. Where an item or surface is not mentioned, paint the same color as similar adjacent materials or surfaces. If color or finish is not designated, the Architect will select from standard colors or finishes available.
 - 8. Except in mechanical and electrical rooms paint all exposed plumbing, heating, fire protection, electrical materials and other items not specifically mentioned to match the walls and ceilings of that area unless noted otherwise. This shall include, but not be limited to, pipes, sprinkler piping, insulation, conduit, ducts, access panels, grilles, diffusers, hangers, exposed steel and iron supports, and surfaces of plumbing, HVAC and electrical equipment that do not have a factory applied finish, whether the adjacent surfaces receive paint or not. Include dampers or baffles behind grilles.
 - 9. Paint interiors of ducts showing through registers and grilles flat black. Paint all louvers and grilles.

10. Do not paint electrical device face plates or devices, sprinkler heads, smoke alarms or thermostats/covers.
11. Unless otherwise directed, remove and spray paint metal items/products that are removable such as vents, registers, access panels, covers, louvers and diffusers. Reinstall upon completion.
12. Painting is not required on pre-finished items, finished metal surfaces, concealed surfaces, operating parts, sprinkler heads, or labels.
13. Paint prime coated or previously painted hinges the same as door frame to which they are attached.
14. Labels: Do not paint over Underwriter's Laboratories, FMG <<http://www.fmglobal.com/>> or other code-required labels, or equipment name, identification, performance rating, or nomenclature plates.
15. Paint access doors, panels, registers, diffusers, light fixture trim, metal speaker covers and grilles the same color as adjacent surfaces. Paint access doors and panels in open position.

3.9 MINIMUM COATING THICKNESS

- A. Apply materials at the manufacturer's recommended spreading rate. Provide total dry film thickness of the system as shown in Paint Schedule.

3.10 COMPLETED WORK

- A. Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

3.11 CLEANING AND TOUCH UP WORK

- A. At the end of each work day, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. Upon completion of painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing, scraping, or other proper methods, using care not to scratch or damage adjacent finished surfaces.
- C. Protect work of other trades, whether to be painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as acceptable to Architect.
- D. Provide "Wet Paint" signs to protect newly-painted finishes. Remove temporary protective wrappings provided by others for protection of their work after completion of painting operations. At completion of construction activities of other trades, touch-up and restore damaged or defaced painted surfaces.
- E. Where touch-ups occur, match color and sheen of existing surface. Touch-ups must blend invisibly, or painting must be extended to nearest corner or other termination point, as acceptable to Architect.

END OF SECTION 09 9000

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Exterior Paint Schedule

Item	Requirement Substrate	location	Mils per coat (Wet/Dry)		ICI		Pittsburg		Sherwin Williams		Benjamin Moore		Pratt & Lambert		Finish		Notes
			Primer	Finish	Primer	2 Finish	Primer	2 Finish	Primer	2 Finish	Primer	2 Finish	Primer	2 Finish	Luster	Final Coats	
Ferrous Metals	Primer on Bare Metal	Stacks, Pipes, Beams, Misc Metals	6	3	ICI - Devflex-4020	ICI - Devflex-4216	94-238 Multi Prime	7-944 Alkyd Semi Gloss Enamel	KemKromik Metal Primer B50Z	Metaelastic DTM B55Z Series	M06 Alkyd Metal Primer	M29 DTM Acrylic	S4501 Rust Inhibitive Metal Primer	Maint. Gloss S4500 Series	Semi gloss	Acrylic Enamel	
Factory Primed Steel	Factory Primed	Doors and Frames, Exposed Piping	-	3	Per the Manf.	Devflex High Performance 4216	90-709 Pitt-Tech Primer Finish DTM	90-474 Pitt-Tech High Perf. Waterborne DTM Enamel	DTM Acrylic Primer/Finish	DTM Acrylic Semi-Gloss #B66-200	M29 DTM	M29 DTM	Enducry DTM Z6600 Series	Semi gloss	Acrylic Enamel		
Galvanized Steel	Factory Galvanized	Linteils, frames, supports, steel beams, columns, etc	10	3.5	Devflex 4020 PF DTM Flat Primer/Finish	Devflex 4216 HP Acrylic Semi-Gloss Enamel	90-709 Pitt-Tech Primer Finish DTM	90-474 Pitt-Tech High Perf. Waterborne DTM Ind. Enamel	Sher-Cryl High Perf. Acrylic Pro-Cryl Univ. Primer	DTM Acrylic Semi-Gloss #B66-200	M29 DTM Acrylic	M29 DTM Acrylic Semi-Gloss	Steeltech Z6631 (Off White) Universal Primer	Semi gloss	Acrylic Enamel		
Galvanized Steel	Factory Galvanized	HM Doors & frames any exposed metals, bollards, gates/post	10	3.5	Devflex 4020 PF DTM Flat Primer/Finish	Devflex 4216 HP Acrylic Semi-Gloss Enamel	90-709 Pitt-Tech Primer Finish DTM	90-474 Pitt-Tech High Perf. Waterborne DTM Ind. Enamel	Pro-Cryl Universal Primer	Sher-Cryl High Performance Acrylic Semi-Gloss	M29 DTM Acrylic	M29 DTM Acrylic Semi-Gloss	Steeltech Z6631 (Off White) Universal Primer	Semi gloss	Acrylic Enamel	Primed by not finished painted exterior and site items	
Cement/Fiber Siding and Trim	Factory Primed	Exterior Cement Siding	8	3.2	Per the Manf.	Dulex Ext. 2407 Latex	SpeedHide Acrylic Latex 6-900	S-W Loxon Acrylic Masonry Primer, A24W8300	S-W Loxon Acrylic Masonry Primer, A24W8300	S-W Metalatex Acrylic Semi-Gloss, B42 Series	Per the Manf.	Per the Manf.	Per the Manf.	Semi - Gloss	Latex		
Ext. Wood	Wood	Sheds, benches, fences, ext. wood	-	4	Ext. Stain; applied on species indicated to match Architect's sample.	Woodpride Exterior Gloss Polyurethane Varnish	Ext. Stain; applied on species indicated to match Architect's sample.	Exterior Polyurethane Sain Clear Varnish	Ext. Stain; applied on species indicated to match Architect's sample.	Exterior Wood Classics Polyurethane Varnish A67 Series	Ext. Stain; applied on species indicated to match Architect's sample.	Ext. Stain; applied on species indicated to match Architect's sample.	Ext. Stain; applied on species indicated to match Architect's sample.	Low	Poly-urethane	Unfinished wood	
Traffic Paint	Concrete or Asphalt	parking lots			Per the Manf.	Water Reducible Acrylic -4800	SpeedHide traffic zone line T1-53										
Exterior CMU	Concrete Block	Misc Walls	16	8	Block Fill 4000 Int/Ext Acrylic Block Filler	Dulex Ext. 2407 Latex	LTC Block Surface Filler-4-100	SpeedHide Acrylic Latex 6-900	S-W PrepRite Block Filler, B25W25	S-W Metalatex Acrylic Semi-Gloss, B42 Series	M88 Block Filler	Super Spec Ext. Acrylic 184	Pro-Hide Silver Z9485 Block Filler	Pro-Hide Silver Int/Ext Semi Gloss z8301	Semi gloss	Acrylic Latex	

Interior Paint Schedule

Item	Requirement	Mils per coat (Wet/Dry)				Manufacturer				Finish		Notes						
		Primer		Finish		ICI		Pittsburg		Sherwin Williams			Benjamin Moore		Pratt & Lambert		Luster	Final Coats
		w	D	W	D	Primer or Stain	2 Finish or Stain	90-474 Pitt-Tech High Performance Waterborne DTM Enamel	Primer or Stain	2 Finish or Stain	Primer or Stain		2 Finish or Stain	Primer or Stain	2 Finish or Stain			
Factory Primed Steel	Doors and Frames, Exposed Piping	-	3	-	3.25	Devflex High Performance 4216	90-709 Pitt-Tech Waterborne DTM Enamel	90-810 Pitt-Tech Edt Semi-Gloss Enamel	DTM Acrylic Primer/Finish	DTM Acrylic Semi-Gloss #866-200	M29 DTM	M29 DTM	Enduryl DTM Z6600 Series	Enduryl DTM Z6600 Series	Semi gloss	Acrylic Enamel		
Ferrous Metals	Stacks, Pipes, Beams, Misc Metals	6	3	5	3	ICI - Devlox- Devflex - 4020	ICI - Devlox - Devflex - 4216	Spraymaster Pro Uni-Grip-WB 1486	KemKromik Metal Primer B50Z	Metalaastic DTM B55Z Series	M06 Alkyd Metal Primer	M29 DTM Acrylic	S4501 Rust Inhibitive Metal Primer	Maint. Gloss S4500 Series	Semi gloss	Acrylic Enamel	Test patch for adhesion to be approved by Architect before installation	
Ferrous Metals	Exposed Structure, Steel, Deck, Joist	2	-	4	2	Per the Manf.	Per the Manf.	Spraymaster Pro Uni-Grip-WB 1486	Per the Manf.	Water Based Dryfall B42 T1	M535 Semi-Gloss Dryfall Water Based M53 Flat Dryfall Water Base	M535 Semi-Gloss Dryfall Water Based M53 Flat Dryfall Water Base	Enduryl Latex Dryfall Z5931 (black) or Z5900 (white)	Semi gloss	Latex	Test patch for adhesion to be approved by Architect before installation		
Ferrous Metals	Galvanized Steel	2	-	4	2	Per the Manf.	Per the Manf.	Spraymaster Pro Uni-Grip-WB 1486	Per the Manf.	Water Based Dryfall B42 T1	M535 Semi-Gloss Dryfall Water Based M53 Flat Dryfall Water Base	M535 Semi-Gloss Dryfall Water Based M53 Flat Dryfall Water Base	Enduryl Latex Dryfall Z5931 (black) or Z5900 (white)	Semi gloss	Latex	Test patch for adhesion to be approved by Architect before installation		
Wood Stained	Clearcoat Only	-	-	4	1.8	Woodpride 1908 Interior Gloss Polyurethane Varnish	77-89 REZ Interior Polyurethane Satin Clear Varnish	Woodpride 1908 Interior Gloss Polyurethane Varnish	Wood Classics Polyurethane Varnish A67 Series	Wood Classics Polyurethane Varnish A67 Series	C435 Benwood Polyurethane Low Lustre	C435 Benwood Polyurethane Low Lustre	Varmor R10 Series Varnish	Satin	Poly-Urethane			
Wood Stained	Stain and Varnished	-	-	4	1.8	Woodpride 1700 Polyurethane Varnish	77-89 REZ Interior Polyurethane Satin Clear Varnish	Woodpride 1802 Interior Gloss Polyurethane Varnish	Premium Custom Stain applied on species indicated	Wood Classics Polyurethane Varnish A67 Series	Premium Custom Stain applied on species indicated	C435 Benwood Polyurethane Low Lustre	Premium Custom Stain applied on species indicated	Varmor R10 Series Varnish	Satin	Poly-Urethane	Match Architect's sample or coordinate color with architect	
Painted interior trim	Painted	4	1.4	4	1.6	Dulux Gripper 3210	Dulux 1434	Dulux Gripper 3210	S-W PrepRite Pro Block Latex. B51 Series	200 Latex Egg-Shel, B20W2200 Series	-	-	-	Satin	Latex			
Concrete Block - Eg Shel	Exposed Block	16	8	4	2	Prep & Prime 3010 Water-based Block Filler	Dulux Pro Premium 1402 Acrylic Latex	SpeedHide Interior/Exterior Masonry Latex Block Filler	PrepRite Block Filler B25W25	ProMar 200 Latex Egg-Shel	M88 Block Filler	274 Superspec Eggshell	Pro-Hide Silver Block Filler Z8485	Pro-Hide Gold Latex Egg-shell Z8200 Series	Eg-shel	Latex		
Concrete Block - Epoxy Coated	Exposed Block	16	8	4	2	Tru-Glaze-WB 4408 Waterborne Epoxy Gloss Coating	Tru-Glaze-WB 4408 Waterborne Epoxy Gloss Coating	97-685 Aquapon Epoxy Block Filler	coat Kem Cali-Coat High Solids B42W400	Tile-Clad High Solids Series, Gloss	M36/M39 Epoxy High Build	M36/M39 Epoxy High Build	Techgard Epoxy Block Filler S4250, S4251 (activator)	Palgard Epoxy, Gloss	Gloss	Epoxy	Epoxy Based Paint for Showers, High Humidity Areas and Kitchens	
Concrete Block - Semi Gloss	Exposed Block	16	8	4	2	Prep & Prime 3010 Water-based Block Filler	Dulux Pro Premium 1406 Acrylic Latex Semi-Gloss	SpeedHide Int. Ext. Masonry Latex Block Filler	PrepRite Block Filler B25W25	ProMar 200 Latex Semi Gloss	M88 Block Filler	276 Superspec Semi-Gloss	Pro-Hide Silver Z8485 Block Filler	Pro-Hide Gold Z8300 Series Latex Semi-Gloss	Semi - Gloss	Latex	Higher Abuse Walls, Corridor Walls, Lobbies and Teaching walls	
Concrete Block - Epoxy Coated - Semi	Exposed Block	16	8	6	3.5	Blockfil-4000 Heavy Duty Acrylic Block Filler	Glaze-WB 4406 Waterborne Epoxy Semi-Gloss Coating	6-7 SpeedHide Interior/Exterior Masonry Latex Block Filler	PrepRite Block Filler B25W25	Water Based Catalyzed Epoxy B 70 Series, Semi-Gloss	M88 Block Filler	M42 Waterborne Epoxy	Z8465 Enduryl HP Block Filler	Enduryl Water Based Catalyzed Epoxy Z7021/Z7025, Semi-Gloss	Semi-Gloss	Epoxy	Water Based Epoxy for Girls and Boys Wet Walls Only	

Gypsum Board - Standard Wall Application	Gypsum Board	General Areas	4	1.25	4	1.5	Dulux Gripper 3210	Dulux Pro Premium 1402 Acrylic Latex Eggshell	6-2 SpeedHide Interior Quick-Drying Latex Sealer	6-411 Series SpeedHide Eggshell/Acrylic Latex Enamel	Harmony Primer	ProMar 200 Latex Egg-shell B20 Series	253 Superspec Primer	274 Superspec Eggshell	Z8160 Pro-Hide Gold Latex Primer	Pro-Hide Gold Series Latex Eggshell	Eg-shell	Latex	
Gypsum Board - Soffits	Gypsum Board	Soffits and Ceilings	4	1.25	4	1.5	Dulux Gripper 3210	Dulux 1210	6-2 SpeedHide Interior Quick-Drying Latex Sealer	6-70 Line SpeedHide Interior Wall Flat Latex Paint	Harmony Primer	ProMar 200 Flat Latex B30-200 Series	253 Superspec Primer	275 Superspec Flat	Z8160 Pro-Hide Gold Latex Primer	Z8100 Series Pro-Hide Gold Flat Latex	Latex	Latex	
Gypsum Board - Subbubble	Gypsum Board	Walls	4	1.25	4	1.5	Prep & Prime Gripper 3210 Primer Sealer	Tri-Glaze-WB 4406 Waterborne Epoxy Semi-Gloss Coating	6-2 SpeedHide Interior Quick-Drying Latex Sealer	16-551 Pitt-Glaze WB Acrylic Epoxy Semi-Gloss	Harmony Primer	Water Based Catalyzed Epoxy Semi-Gloss B70 Series	023 Fresh Start Primer	M43/M44 Acrylic Epoxy Semi-Gloss	Z8160 Pro-Hide Gold Latex Primer	Enducryl/Water Based Catalyzed Epoxy Series (Z7025 Semi-Gloss Activator)	Semi-Gloss	Epoxy	Scrubable and wet Applications
Gypsum Board - Subbubble	Gypsum Board	Kitchens and Baths	4	1.25	4	1.5	Prep & Prime Gripper 3210 Primer Sealer	Zinsser Bathroom and Kitchen paint	-	-	-	-	-	-	-	-	Gloss	Latex	Scrubable and wet Applications
VCT Flooring	VCT	Gym Floors	-	5	-	6	Devifloor 506 Water-Based Epoxy Primer and Devifloor 525 100% Solids Epoxy Surfacer	Devifloor 568 High Solids Urethane	PPG MegaSeal 99-6639 High Solids Primer Clear and 1 coat/MegaSeal WBPG 99-6637 WB Primer Gray	PPG Megaseal HPU 99-6730 High Performance Urethane	CP #5531 primer at 500 to 1,000 sf per gallon and 1 coat GP #3504 High Solids Epoxy Primer	GP #4638 General Polymer	M36/M39 High Build Epoxy at 500 to 1,000 sf per gallon	coats of M36/M37 Epoxy Clear	S6700 Series HS Floor Epoxy and Activator	S6500 Series HS Polyurethane	Satin	Poly-Urethane	Stripping on VCT Floors

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SECTION 10 0500
BASIC MATERIALS AND METHODS: SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes basic requirements for specialties specified in subsequent Division 10 Sections.
- B. Related Work Specified in Other Sections:
 - 1. Section 06 1000 - Rough Carpentry.

1.2 REFERENCES

- A. General: Section 01 4219 - Reference Standards.
- B. Refer to individual Sections for extent of referenced standards specified in this Division.
- C. Americans With Disabilities Act (ADA).
- D. American Society for Testing and Materials (ASTM).
 - 1. ASTM A 153: Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware.
 - 2. ASTM A 653: Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
 - 3. ASTM A 1008: Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low Alloy with Improved Formability.
 - 4. ASTM B 456: Standard Specification for Electrodeposited Coatings of Copper Plus Chromium and Nickel Plus Chromium.
 - 5. ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 6. ASTM F 446: Consumer Safety Specification for Grab Bars and Accessories Installed in a Bathing Area.

1.3 SUBMITTALS

- A. General: Section 01 3000 – Administrative Requirements: For Submittal Procedures.
- B. Manufacturer's product data for specified products.
- C. Manufacturer's certifications certifying compliance with specified requirements and referenced standards.
- D. Shop drawings detailing installation of products, including supplementary framing, blocking, fastening requirements to comply with loading requirements, and conditions at rough openings and substrates.
- E. Templates and setting diagrams.
- F. Contract Closeout Submittals:
 - 1. General: Refer to Section 01 7000 – Execution Requirements.
 - 2. Warranties: Executed warranties, signed by manufacturer and Contractor.
 - 3. Spare parts and keys: deliver to Owner's representative and retain signed receipts.
 - 4. Maintenance instructions for proper care and maintenance of products.

1.4 QUALITY ASSURANCE

- A. General: Section 01 4000 – Quality Requirements.
- B. Installer Qualifications: Engage only qualified installers to perform work.
- C. Source Limitation: Obtain each type of specified product from a single qualified manufacturer and distribution source.

1.5 COORDINATION

- A. Perform and record field measurements to ensure proper fit and function of products.
- B. Furnish installation instructions, templates, and setting diagrams to trades responsible for installation.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Comply with manufacturer's delivery, storage, and handling information.

- B. Establish proper storage conditions at shops, the site, and other points of delivery to prevent loss, deterioration, damage, and theft.
 - 1. Provide temporary heat and humidity control if required to achieve the conditions required by referenced standards.
 - 2. Store products in accordance with referenced standards to prevent detrimental exposure, condensation, and other incidental damage at the site.
- C. Inspect and inventory products upon delivery. Reject defective or damaged products and promptly remove them from the Site.

PART 3 EXECUTION

2.1 EXECUTION, GENERAL

- A. Refer to Section 01 7000 – Execution Requirements.

2.2 INSPECTION

- A. Verify acceptability of substrate conditions in accordance with referenced standards and manufacturer's instructions. Correct non-complying conditions, including removal of interfering elements, restoration of substrates, and installation of supplementary framing, blocking, and supports. Do not proceed with installation until all objectionable conditions are corrected.

2.3 PREPARATION

- A. Isolate components to prevent contact with incompatible substrates, including dissimilar metals to prevent galvanic reaction.

2.4 INSTALLATION

- A. Install products in accordance with the drawings, manufacturer's recommendations, and approved shop drawings.

2.5 OPERATION AND ADJUSTMENT

- A. Test installed products to ensure proper operation.

END OF SECTION 10 0500

**SECTION 10 1400
SIGNAGE**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Room and door signs.
- B. Interior directional and informational signs.

1.1 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's printed product literature for each type of sign, indicating sign styles, font, foreground and background colors, locations, overall dimensions of each sign.
- C. Signage Schedule: Provide information sufficient to completely define each sign for fabrication, including room number, room name, other text to be applied, sign and letter sizes, fonts, and colors.
 - 1. When room numbers to appear on signs differ from those on the drawings, include the drawing room number on schedule.
 - 2. When content of signs is indicated to be determined later, request such information from Owner through Architect at least 2 months prior to start of fabrication; upon request, submit preliminary schedule.
 - 3. Submit for approval by Owner through Architect prior to fabrication.
- D. Samples: Submit two samples of each type of sign, of size similar to that required for project, illustrating sign style, font, and method of attachment.
- E. Selection Samples: Where colors are not specified, submit two sets of color selection charts or chips.
- F. Verification Samples: Submit samples showing colors specified.
- G. Manufacturer's Installation Instructions: Include installation templates and attachment devices.

1.3 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Package signs as required to prevent damage before installation.
- B. Package room and door signs in sequential order of installation, labeled by floor or building.
- C. Store tape adhesive at normal room temperature.

1.5 FIELD CONDITIONS

- A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.
- B. Maintain this minimum temperature during and after installation of signs.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Flat Signs:
 - 1. Best Sign Systems, Inc: www.bestsigns.com.
 - 2. ASI Sign Systems Inc.
 - 3. Diskey Sign Corp.
 - 4. Ellet Sign Company.

2.2 SIGNAGE APPLICATIONS

- A. Accessibility Compliance: All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.
- B. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.
 - 1. Sign Type: Flat signs with engraved panel media as specified.

2. Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille.
 3. Character Height: 1 inch.
 4. Sign Height: 2 inches, unless otherwise indicated.
 5. Locations: As indicated on the drawings.
 6. Names "MEN" and "WOMEN", room numbers to be determined later, and braille.
- C. Interior Directional and Informational Signs:
1. Sign Type: Same as room and door signs.
 2. Sizes: As indicated on the drawings.

2.3 SIGN TYPES

- A. Flat Signs: Signage media without frame.
1. Edges: As indicated on the drawings.
 2. Corners: As indicated on the drawings.
 3. Wall Mounting of One-Sided Signs: Tape adhesive.
- B. Color and Font: Unless otherwise indicated:
1. Character Font: Helvetica, Arial, or other sans serif font.
 2. Character Case: Upper case only.
 3. Background Color: Clear.
 4. Character Color: Contrasting color as selected by Architect from manufacturer's full standard range.

2.4 TACTILE SIGNAGE MEDIA

- A. Engraved Panels: Laminated colored plastic; engraved through face to expose core as background color:
1. Total Thickness: 1/16 inch.

2.5 NON-TACTILE SIGNAGE MEDIA

- A. Silk Screened Plastic Panels: Letters and graphics silk screened onto reverse side of plastic surface:
1. Sign Color: Clear.
 2. Total Thickness: 1/8 inch.

2.6 ACCESSORIES

- A. Tape Adhesive: Double sided tape, permanent adhesive.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces are ready to receive work.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install neatly, with horizontal edges level.
- C. Locate signs where indicated:
 1. Room and Door Signs: Locate on wall at latch side of door with centerline of sign at 60 inches above finished floor.
 2. If no location is indicated obtain Owner's instructions.
- D. Protect from damage until Substantial Completion; repair or replace damage items.

END OF SECTION 10 1400

**SECTION 10 2601
CORNER GUARDS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Corner Guards.

1.2 REFERENCE STANDARDS

1.3 ACTION SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

PART - 2 PRODUCTS

2.1 MANUFACTURERS

- A. Corner Guards:
 - 1. Arden Architectural Specialties, Inc: www.ardenarch.com.
 - 2. Construction Specialties, Inc: www.c-sgroup.com.
 - 3. InPro Corporation: www.inprocorp.com.
 - 4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 COMPONENTS

- A. Corner Guard - Surface Mounted: High impact vinyl with extruded aluminum full height retainer and integral impact absorbing device.
 - 1. Size: 2 inches.
 - 2. Corner: Square.
 - 3. Color: Architect to selected from manufacturer's standard colors.
 - 4. Length: One piece.
 - 5. Preformed end caps.

2.3 FABRICATION

- A. Fabricate components with tight joints, corners and seams.
- B. Pre-drill holes for attachment.
- C. Form end trim closure by capping and finishing smooth.

PART - 3 EXECUTION

3.1 EXAMINATION

- A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located
- B. Verify that field measurements are as indicated on Drawings.

3.2 INSTALLATION

- A. Install components in accordance with manufacturer's instructions, level and plumb, secured rigidly in position to wall framing members only.
- B. Terminate rails 6 inches short of door opening.

3.3 TOLERANCES

- A. Maximum Variation from Required Height: 1/4 inch.
- B. Maximum Variation from Level or Plane for Visible Length: 1/4 inch.

END OF SECTION 10 2601

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**SECTION 10 2800
TOILET AND BATH ACCESSORIES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Accessories for bathrooms.
- B. Grab bars.

1.2 RELATED SECTIONS

- A. Section 10 0500 – Basic Materials and Methods: Specialties

1.3 SUBMITTALS

- A. Manufacturer's product data for each type of accessory specified.
- B. Accessories schedule.

PART 2 PRODUCTS

2.1 PUBLIC TOILET ROOMS – ACCESSORY SCHEDULE

- A. Toilet Paper Dispenser: Single roll, surface-mounted, stainless steel unit with pivot hinge, tumbler lock.
- B. Paper Towel Dispenser: Automatic, battery powered, surface mounted, roll dispenser, Basis of Design: Bobrick B-72974.
- C. Soap Dispenser: Automatic, surface mounted, ADA compliant, satin finish stainless steel, liquid soap, 30 fl oz, refill window, concealed fastening, battery powered. Basis of Design: Bobrick B-2012.
- D. Mirrors: Stainless steel framed, 6 mm thick float glass mirror. Size: As indicated on drawings. Frame: 0.05 inch angle shapes, with mitered and welded and ground corners, and tamperproof hanging system; No.4 finish. Backing: Full-mirror sized, minimum 0.03 inch galvanized steel sheet and non-absorptive filler material.
- E. Grab Bars: HD Supply Maintenance Warehouse, stainless steel, concealed mount, 1.5" diameter
 - a. 18", Model Number #731222
 - b. 36", Model Number #731225
 - c. 42", Model Number #431227

2.2 ACCESSIBLE UNIT - ACCESSORIES SCHEDULE

- A. Shower Curtain Rod: 36", HD Supply or approved equal, straight, chrome plated stainless steel with zinc mounting brackets.
- B. Shower Curtain: Econocord #752540, Color White
- C. Medicine Cabinet: Basis of Design: HD Supply American Pride, 16" wide x 26" high recessed raised panel medicine cabinet #115194.
- D. Mirrors: Frameless polished edge, 4 mm thick float glass mirror. Basis of Design: HD Supply #737960.
- E. Toilet Paper Dispenser: HD Supply Seasons Bradshire #818016, chrome, concealed mount
- F. Towel Bar: 24", HD Supply Seasons Bradshire #818021, chrome, concealed mount
- G. Towel Ring: HD Supply Seasons Bradshire #818018, chrome, concealed mount
- H. Grab Bars: HD Supply Maintenance Warehouse, stainless steel, concealed mount, 1.5" diameter
 - a. 18", Model Number #731222
 - b. 36", Model Number #731225
 - c. 42", Model Number #431227
- I. Robe Hook: HD Supply Seasons Bradshire #818017, chrome, concealed mount
- J. Shower Seat: Owner Provided

2.3 MATERIALS

- A. Stainless Steel Sheet: ASTM A666, Type 304, No. 4 satin brushed finish.
- B. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating.
- C. Chrome/Nickel Plating: ASTM B456, US26 unless otherwise noted.
- D. Mirror Glass: Float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.
- E. Adhesive: Two component epoxy type, waterproof.
- F. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type.
- G. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install accessories in accordance with manufacturers' instructions.
- B. Install plumb and level, securely and rigidly anchored to substrate.
- C. Mounting Heights and Locations: Comply with specified accessibility regulations.

END OF SECTION 10 2800

**SECTION 10 5500
USPS-DELIVERY POSTAL SPECIALTIES**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Accessories.

1.2 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 COLLECTION BOXES

- A. Collection Box: Provide new address plates with braille on existing boxes.
 - 1. Mounting: Surface mounted per manufacturer's installation instructions.
 - 2. Color: to be selected from standards

- B. Outgoing Mail: Provide new outgoing mail plaque with braille on existing box.
 - 1. Mounting: surface mounted per manufacturer's installation instructions.
 - 2. Color: to be selected from standards.

2.2 FABRICATION

- A. Form postal specialties to required shapes and sizes, with true lines and angles, square, rigid, and without warp, and with metal faces flat and free of dents or distortion. Make exposed metal edges and corners free of sharp edges and burrs and safe to touch.
- B. Where dissimilar metals contact each other, protect against galvanic action by painting contact surfaces with bituminous coating or by applying other permanent separation as recommended by manufacturers of dissimilar metals.

PART 3 - Not used

END OF SECTION 10 5500

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**SECTION 10 5623
WIRE STORAGE SHELVING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Wall mounted wire closet shelving.
- B. Adjustable pantry shelving.
- C. Accessories.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Owner's Standard: ClosetMaid Corporation Superslide: www.closetmaid.com.

2.2 SHELVING APPLICATIONS

- A. Shelf Depth: 12 inches (305 mm), unless otherwise indicated with adjustable mount hardware.

2.3 MATERIALS

- A. Wire Shelving: Factory-assembled coated wire mesh shelf assemblies for wall-mounting, with all components and connections required to produce a rigid structure that is free of buckling and warping.
 - 1. Construction: Cold-drawn steel wire with average tensile strength of 100,000 psi (690 MPa) resistance welded into uniform mesh units, square, rigid, flat, and free of dents or other distortions, with wires trimmed smooth.
 - 2. Coating: PVC or epoxy, applied after fabrication, covering all surfaces.
 - 3. PVC Coating: 9 to 11 mils (0.23 to 0.028 mm) thick.
 - 4. Standard Mesh Shelves: Cross deck wires spaced at 1 inch (25.4 mm).
 - 5. Shelf and Rod Units: Integral hanging rod at front edge of shelf.
- B. Mounting Hardware: Provide manufacturer's standard adjustable mounting hardware; include support braces, wall brackets, back clips, end clips, poles, and other accessories for complete and secure installation; factory finished to match shelving.
- C. Fasteners: As recommended by manufacturer for mounting substrates.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions, with shelf surfaces level.
- B. Cap exposed ends of cut wires.
- C. Install back clips, end clips at side walls, and support braces at open ends. Install intermediate support braces as recommended by manufacturer.

END OF SECTION 10 5623

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**SECTION 11 3100
RESIDENTIAL APPLIANCES**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Kitchen appliances.

1.2 REFERENCE STANDARDS

- A. UL (EAUED) - Electrical Appliance and Utilization Equipment Directory; Underwriters Laboratories Inc.; current edition.

1.3 SUBMITTALS

- A. See Section 01 3000 Administrative Requirements.
- B. Product Data: Manufacturer's data indicating dimensions, capacity, and operating features of each piece of residential equipment specified.
- C. Copies of Warranties: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.4 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section, with not less than three years of documented experience.
- B. Electric Appliances: Listed and labeled by UL and complying with NEMA standards.

1.5 WARRANTY

- A. Provide five (5) year manufacturer warranty on refrigeration system of refrigerators.
- B. Provide ten (10) year manufacturer warranty on tub and door liner of dishwashers.

PART 2 PRODUCTS

2.1 COMMUNITY KITCHEN APPLIANCES

- A. Refrigerator: UFAS Accessible
 - 1. Owner provided and installed.

2.2 ACCESSIBLE UNIT - KITCHEN APPLIANCES

- A. Refrigerator: UFAS Accessible
 - 1. Owner provided and installed.
- B. Range: Electric, Drop-in, self-cleaning, front controls, smooth top
 - 1. Size: 30 inches.
 - 2. Finish: White.
 - 3. Owner Standard: GE Appliance #JD630DFWW
 - 4. Rear Filler Strip: GE Appliance #WB07T10681
- C. Range Hood: recirculating, under cabinet, 190 CFM, provide with light
 - 1. Size: 30 inches.
 - 2. Finish: White.
 - 3. Owner Standard: Broan NuTone #413001
 - 4. Provide with light bulb
 - 5. Controls: mounted in false drawer front. See drawings for location.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify utility rough-ins are present and correctly located.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Anchor built-in equipment in place.

3.3 ADJUSTING

- A. Adjust operating equipment to efficient operation.

3.4 CLEANING

- A. Remove packing materials from equipment.
- B. Wash and clean equipment.

END OF SECTION 11 3100

**SECTION 12 3530
RESIDENTIAL CASEWORK**

PART 1 GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including the Conditions of the Contract and Division 01 Specification Sections, apply to this Section.

1.2 SECTION INCLUDES

- A. Kitchen cabinets.

1.3 RELATED REQUIREMENTS

- A. Section 12 3600 – Countertops.

1.4 REFERENCE STANDARDS

- A. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2010 (ANSI/BHMA A156.9).
- B. ANSI/KCMA A161.1 - Performance and Construction Standard for Kitchen and Vanity Cabinets; Kitchen Cabinet Manufacturers Association.
- C. ICPA: International Cast Plastics Alliance.
- D. KCMA (DIR) - Directory of Certified Cabinet Manufacturers; Kitchen Cabinet Manufacturers Association.

1.5 SUBMITTALS

- A. ANSI/KCMA A161.1 certification.
- B. Shop Drawings: Indicate casework locations, large scale plans, elevations, clearances required, rough-in and anchor placement dimensions and tolerances
- C. Samples for verification: Submit samples verifying

1.6 QUALITY ASSURANCE

- A. Products: Complying with KCMA A161.1 and KCMA Certified.
- B. Manufacturer: Company specializing in manufacturing the type of products specified in this section, with minimum three years of documented experience.

PART 2 PRODUCTS

2.1 KCMA CERTIFIED CABINETS

- A. All cabinetry shall comply with ANSI/KCMA A161.1, and Paragraph 611-1.1, "HUD Minimum Property Standards - Housing 4910.1, and be certified and labelled as such.
- B. Acceptable Manufacturer: Merillat Classic Fusion.
 - 1. Color: Pecan

2.2 COMPONENTS

- A. Countertops as specified in 12 3600.

2.3 HARDWARE

- A. Hardware: BHMA A156.9, Grade 1.
- B. Shelf Standards and Rests: Vertical steel standards with rubber button fitted steel rests.
- C. Shelf Brackets: Vertical chrome steel standards with chrome steel arms.
- D. Drawer Slides: Extension arms, steel and ball bearing construction.
- E. Hinges: Offset pin.
- F. Pulls: Gatehouse #340569, Satin Nickel, 4" centers

2.4 FABRICATION

- A. Shop assemble casework for delivery to site in units easily handled and to permit passage through building openings.
- B. Fabricate corners and joints without gaps or inaccessible spaces or areas where dirt or moisture could accumulate.

- C. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
- D. Form smooth edges. Form material for countertops and shelves from continuous sheets.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify adequacy of support framing. Supplement with additional material as the fabricator recommends.

3.2 INSTALLATION

- A. Install casework, components and accessories in accordance with manufacturer's instructions.
- B. Set casework items plumb and square, securely anchored to building structure.
- C. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (1 mm). Use filler strips; not additional overlay trim for this purpose.
- D. Close ends of units, back splashes, shelves and bases.

3.3 ADJUSTING

- A. Adjust doors, drawers, hardware, fixtures, and other moving or operating parts to function smoothly.

3.4 CLEANING

- A. Clean casework, countertops, shelves, and hardware.

3.5 PROTECTION

- A. Do not permit finished casework to be exposed to continued construction activity.

END OF SECTION 12 3530

SECTION 12 3600 COUNTERTOPS

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Countertops for manufactured casework.
- B. Wall-hung counters and vanity tops.
- C. Window Sills.

1.2 RELATED REQUIREMENTS

- B. Section 07 9200 - Joint Sealants: For sealing of joints with adjacent materials.
- C. Plumbing Fixtures: Sinks. (See Drawings)

1.3 REFERENCE STANDARDS

- A. ANSI A208.1 - American National Standard for Particleboard; 2009.
- B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010b.
- C. AWI/AWMAC (QSI) - Quality Standard Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.
- D. ISSFA-2 - Classification and Standards for Solid Surfacing Material; International Solid Surface Fabricators Association; 2001 (2007).
- E. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.4 SUBMITTALS

- A. See Section 01 3000 - Administrative Requirements, for submittal procedures.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Storage and handling requirements and recommendations.
 - 3. Specimen warranty.
- C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.
- D. Selection Samples: For each finish product specified, color chips representing manufacturer's full range of available colors and patterns.
- E. Verification Samples: For each finish product specified, minimum size 6 inches square, representing actual product, color, and patterns.
- F. Test Reports: Chemical resistance testing, showing compliance with specified requirements.
- G. Installation Instructions: Manufacturer's installation instructions and recommendations.
- H. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Same fabricator as for cabinets on which tops are to be installed.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products in manufacturer's unopened packaging until ready for installation.
- B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.7 FIELD CONDITIONS

- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 COUNTERTOP ASSEMBLIES

- A. Plastic Laminate Countertops: High pressure decorative laminate sheet bonded to substrate.
 - 1. Laminate Sheet Unless Otherwise Indicated: NEMA LD 3 Grade.

- a. Surface Burning Characteristics: Flame spread 25, maximum; smoke developed 450, maximum; when tested in accordance with ASTM E84.
 - b. NSF approved for food contact.
 - c. Wear Resistance: In addition to specified grade, comply with NEMA LD 3 High Wear Grade requirements for wear resistance.
 - d. Finish: Matte or suede, gloss rating of 5 to 20.
 - e. Surface Color and Pattern: See finish schedule.
 - f. Manufacturers: See finish schedule
2. Exposed Edge Treatment: Postformed laminate; front edge substrate built up to minimum 1-1/4 inch thick with raised radiused edge, integral covered backsplash with radiused top edge.
 3. Back and End Splashes: Same material, same construction.
 4. Fabricate in accordance with AWI/AWMAC Quality Standards Illustrated Premium Grade.

2.2 ACCESSORY MATERIALS

- A. Particleboard for Supporting Substrate: ANSI A208.1 Grade 2-M-2, 45 pcf minimum density; minimum 3/4 inch thick; join lengths using metal splines.
- B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.
- C. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.3 FABRICATION

- A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
 1. Join lengths of tops using best method recommended by manufacturer.
 2. Fabricate to overhang fronts and ends of cabinets 1 inch except where top butts against cabinet or wall or appliance.
 3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.
- B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
 1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
 2. Height: 4 inches, unless otherwise indicated.
- C. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Do not begin installation until substrates have been properly prepared.
- B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.
- C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.2 PREPARATION

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.3 INSTALLATION

- A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.
- B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch.
- C. Seal joint between back/end splashes and vertical surfaces.

3.4 TOLERANCES

- A. Variation From Horizontal: 1/8 inch in 10 feet, maximum.
- B. Offset From Wall, Countertops: 1/8 inch maximum; 1/16 inch minimum.
- C. Field Joints: 1/8 inch wide, maximum.

3.5 CLEANING

- A. Clean countertops surfaces thoroughly.

3.6 PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 12 3600

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**SECTION 14 2100
PASSENGER ELEVATOR MODERNIZATION**

**Modernization of the following equipment:
2 Dover Hydraulic Passenger Elevators**

Hydraulic Passenger Elevator		
Elevator	1	2
State ID	25701	25702
Capacity	2000	3500
Speed FPM	150	150
Machine type	Hydraulic	Hydraulic
Operation	Duplex	Duplex
Platform	Retain	Retain
Cab Interior	Retain	Retain
Landings	7	7
Openings	7	7/1
Car Doors	Replace	Replace
Returns	Replace	Replace
Power Source	Bidder	Bidder
Signal Fixtures	Replace	Replace
1. No logos		
2. Car operating panel		
3. Illuminated Push Buttons		
4. ADA Provisions		
5. Emergency Lighting and Fans		
6. Emergency power jewel if applicable		
7. Exhaust Fan		
8. Firefighter's Service		
9. Independent Service		
10. Finish to match existing		
Warranty/ Maintenance period 1 year -24 Hour Callbacks to start at the completion of the project		

1.0 GENERAL CONDITIONS

1.01 RELATED DOCUMENTS

- A. All work shall be subject to the provisions of the full specifications and contract documents and any addenda that may be issued as a result of project requirements.

1.02 DEFINITION OF WORK

- A. The Work to be performed shall include all labor, equipment, material, and services necessary to comply with these Specifications, and provide a complete installation. All Work shall pertain to all elevators listed unless otherwise noted.
- B. Definitions:
 - a. "Provide": To supply, install, connect and make ready for safe and normal operation the complete elevator system as specified herein.
 - b. "Install": To erect, mount, and connect complete with related accessories.
 - c. "Supply": To purchase, procure, acquire and deliver a complete system.
 - d. "Work": Labor, materials, equipment and other items required for proper and complete installation.
 - e. "Wiring": Conduit, fittings, wire, traveling cables, junction and outlet boxes, switches, receptacles, and other related wiring items.
 - f. "Similar" or "Equal": Approved material, weight, size, design and operating characteristics to the specified product.
 - g. "Approved", "Satisfactory", "Accepted", or "Directed": As approved, satisfactory, accepted or directed by General Contractor or their designated representative or agent.
 - h. "Owner": Shall be defined as person or company holding title to property in which this specified work is to be performed. When reference is made to the Owner's representative as the authorized person or company at any place in this specification, then it is implied that the term "Owner" shall include the representative at all times, whether specifically written or not written.
 - i. "Representative" or "Agent": The authorized person employed by the Owner to handle the project or any part of the document preparation.
 - j. "Contractor": Shall be defined as the elevator company contracted to perform the work described in these specifications.
 - k. "Building Transportation" shall be defined as elevators, escalators, dumbwaiters, and moving power walks.

1.03 SCOPE OF WORK

- A. A CPM schedule shall be submitted within 7 days to the General Contractor after contract award. See, §1.30 for schedule requirements.
- B. Furnish and install all materials necessary for a complete modernization of [2] elevators in [existing] shafts in an [existing] building.
- C. Incorporate and coordinate new equipment to be provided with existing equipment to be reused to provide a complete installation.
- D. Any equipment designated to be reused shall be inspected and refurbished to be in like new condition. Such designated equipment found to be incompatible or deficient shall be immediately identified to the General Contractor for corrective action.
- E. Existing hoist ways shall be reused.
- F. The travel, speed, and openings of all elevators shall remain the same for existing elevators with front openings.
- G. All work shall be coordinated in such manner that the building will have minimum interruption of elevator service.
- H. Work is to be performed in approved phases, where applicable. All completed elevators shall be tested and approved prior to releasing for public use, and must operate in service without issue for a period of two days prior to commencement of the next phase of elevator(s) work.
- I. Only one elevator to be modernized at a time, the other elevator will remain in service.

1.04 QUALIFICATION OF BIDDER:

- A. Any bidder, after opening of bids and before the award of contract, upon request by the Owner, shall furnish satisfactory evidence that they have had previous experience and possesses an adequate plant, financial resources and organization to perform the type and quality of work specified and to complete the project within the time specified.
- B. Owner, in its sole discretion, shall make an award to the bidder with whom they determine to have the best ability and equipment to perform the requirements of these specifications.

1.05 UNION REGULATIONS

- A. Contractor shall work in harmony with any other labor unions or permanent building personnel performing work on the site, and shall be responsible for any delays or damages caused by their failure to do so.

1.06 ROYALTIES AND LICENSE FEES

- A. Contractor shall pay all royalties and license fees associated with the equipment provided or work required. Contractor shall defend all suits or claims for royalty rights and shall save the Owner harmless from loss thereof.
- B. Contractor is responsible for all licenses required or costs thereof to perform the requirements of the elevator portion of this specification.
- C. Contractor shall grant any software license to the Owner through the General Contractor as required for Owner's independent and sole use of the software installed in the equipment furnished by Contractor.

1.07 QUALITY ASSURANCE

- A. Installer Qualifications:
Contractor must:
 - a. Have a minimum of five years' experience in the type of work as specified in these Specifications; and
 - b. Have a regular office and staff in the local area of this project; and
 - c. Properly staff this project with qualified personnel for the specified work and subsequent service work; and
 - d. Provide a list of successfully completed similar projects.
- B. Regulatory Requirements: All work shall comply with current governing local codes, conform to all laws, ordinances and regulations affecting the erection and completion of the whole or part of the work, and conform to the requirements of authorities having lawful or customary jurisdiction.
 - a. These requirements shall take preference over the contract documents except where the contract documents require better materials or workmanship, also acceptable to the authorities.
 - b. Contractor is liable and financially responsible for any violations of codes caused by their actions or the action of their employees.
- C. Standards: Except as modified by local governing codes and by this section, the work shall comply with provisions pertaining to building transportation of the following, and in the event of conflict between these standards, the most stringent shall be used.
 - a. ANSI: American National Standards Institute
 - b. ASME: American Society of Mechanical Engineers
 - c. ASME Codes:
 - d. American National Standards Institute A17.1- latest edition and all supplements.
 - e. American National Standards Institute A17.2-Practice for the Inspection of Elevators, Escalators and Moving Walks- Inspectors Manual, latest edition.
 - f. American National Standard Safety Code for Existing Elevators and Escalators, A17.3, latest edition.
 - g. American National Standard Specifications for Buildings and Facilities, Providing Accessibility and Usability for Physically Handicapped People A17.1, latest edition.
 - h. Americans with Disabilities Act Accessibility Guidelines, ADAAG

- i. ASTM: American Society for Testing and Materials.
- j. AWS: American Welding Society.
- k. CS: Commercial Standard U.S. Department of Commerce
- l. CSA: Canadian Standards Association.
- m. IEEE: Institute of Electronic and Electrical Engineers.
- n. ISO: International Standards Organization.
- o. NEII: National Elevator Industry Inc.
- p. NEC: National Electric Code.
- q. NEMA: National Electrical Manufacturing Association.
- r. NFPA: National Fire Protection Association.
- s. NBS: National Bureau of Standards.
- t. OSHA: Occupational Safety and Health Administration.
- u. UL: Underwriters Laboratories.
- v. UFAS: Uniform Federal Accessibility Standard.
- w. Model Building Codes
- x. All applicable local codes

1.08 GUARANTEE

- A. Contractor shall guarantee, in writing to Owner, upon completion of the Work, that all Work installed to be free from any and all defects in workmanship and/or materials, and that if during the period of one year from date of certificate of completion and final acceptance of work, unless a longer period is specified, any defects in workmanship, material or performance appear, Contractor shall promptly remedy such defects without cost to Owner. Should Contractor fail to remedy such defects within a reasonable time, the Owner may have such work performed by others at Contractor's sole expense.
- B. Title of Ownership of equipment furnished pursuant to this Specification shall be transferred to Owner by Contractor upon receipt of final payment.

1.09 TESTING AND CERTIFICATION

- A. Conduct tests and adjustment of equipment as specified or necessary to verify performance requirements as required by the ASME A17.1 Safety Code for Elevators and Escalators.
- B. Upon completion and full operation of all equipment, completely test same, for compliance with the requirements of the Contract Documents. All tests shall be performed in accordance with the requirements of ASME A17 codes and other applicable codes. All equipment necessary and any costs involved for testing are included as part of this contract.
- C. Contractor shall make all necessary changes and remedy all defects resulting from testing at their expense. The corrective action shall be completed to the satisfaction of the Owner. All associated costs for corrective actions and subsequent tests, until the equipment or operation is acceptable, shall be at the expense of the Contractor.
- D. Upon completion of satisfactory tests, Contractor will secure and furnish to the Owner certification from all departments having jurisdiction that the equipment and operation have been final inspected and approved.

1.10 CLEANING AND REMOVAL

- A. Contractor shall at all times keep the premises, driveways and streets, clean and free from excess accumulation of waste materials or rubbish caused by the Contractor's work.
- B. At the completion of each work day, Contractor will remove all rubbish from and around the premises and left broom clean, unless approved otherwise.
- C. Any scaffolding, ladders or tools used shall be properly secured and stored to prevent unauthorized use or access by others.
- D. Should the Contractor fail to attend to such cleaning with reasonable promptness, then Owner may cause such cleaning to be done by others at the expense of the Contractor.
- E. Completion and Removal: After completion of the work and final acceptance, all debris and unused materials shall be removed. Contractor shall final clean the entire work site to the satisfaction of the Owner.

1.11 DISPOSAL OF EXTRANEIOUS EQUIPMENT AND MATERIALS

- A. Contractor will remove and discard all extraneous equipment and materials in a professional and legal manner, inclusive of those equipment or materials requiring special handling.

1.12 DEFECTIVE WORK

- A. The Contractor shall promptly correct work rejected by the Owner or such work that fails to conform to the requirements of the contract documents, whether discovered before or after substantial completion, and whether or not fabricated, installed, or completed. All costs of correcting such rejected work, and other expenses made necessary thereby, shall be at the Contractor's sole expense.
- B. All defective work whether or not in place, may be rejected, corrected or accepted by Owner as provided hereinafter.
- C. When the work is defective or Contractor fails to supply the project with sufficient skilled workmen or suitable materials or equipment, Owner may order Contractor to stop the work, or any portion thereof, until the cause for such order has been eliminated; however, this right of Owner to stop the work shall not give rise to any duty on the part of Owner to exercise its right for the benefit of Contractor or any other party.
- D. When required by Owner, Contractor shall promptly, without cost to Owner, correct any defective work.
- E. When Contractor fails to proceed to correct defective work, or if Contractor fails to perform the work in accordance with the contract, including these bid documents, Owner may, after seventy-two (72) hours written notice to Contractor, correct and remedy any such deficiency at the Contractor's sole expense.
- F. All direct or indirect costs incurred by Owner in exercising such right shall be charged against the Contractor, and a Change Order shall be issued incorporating the necessary revisions of the contract and a reduction in the Contract Price. Such direct and indirect costs shall include, in particular, without limitation, compensation for additional professional services required and all costs of repair and replacement of work of others destroyed or damaged by correction, removal or replacement of Contractor's defective work.

1.13 PRE-MODERNIZATION REPAIRS

- A. These specifications are prepared to cover all equipment repairs and replacements required to provide a thorough installation for a complete modernization. The current maintenance provider may complete some of the repairs that they have in progress or determine that is their responsibility. Should any of these items have been completed and require no further work, delete the items from your proposal and list the deleted items as an exception and the reason for deletion.

1.14 Interim Maintenance Start of Modernization to final car has been completed

- A. Maintenance Service: The elevator contractor shall furnish an all-inclusive first quality maintenance and call-back service on each elevator after it is completed and placed in operation, concurrent with warranty period. This service shall consist of examinations of the equipment at a minimum of once a month. Service shall include adjustments, lubrication, cleaning, supplies and parts to keep the equipment in proper operation, except for such adjustments, replacement of parts or repairs made necessary by abuse, misuse or any other causes beyond the control of the elevator contractor. All work will be done by trained employees of the elevator contractor during regular working hours of the trade. Emergency call-back service shall be provided at no cost to the owner and included for all hours and days during the maintenance period.
- B. Examinations and log: During the maintenance period the elevator contractor shall maintain maintenance records as per ANSI A17.1 Code for each elevator. The records shall be located in the elevator machine room and be used to indicate all callbacks, repairs, replacement of parts, fire service test and adjustments performed by the mechanic each month. Each entry in

the maintenance records shall be signed by the mechanic who performs the work and be kept up to date at all times.

2.0 MATERIALS

Hydraulic Elevators

The materials as listed in this section intend to describe what is to be reused, refurbished or furnished as new for the one passenger elevator covered by these specifications. The following is a summary of the equipment to be modernized:

2.01 RAILS

Reuse in place- The rails shall be cleaned and filed to remove all build-up on rails. Any depression or marks caused by safety applications shall be filed smooth.

Any missing splice plate bolts shall be replaced with proper sized bolts compatible to original bolts. Each splice plate shall be properly tightened.

When performing the full load test at the completion of the modernization the test should be performed with the safety application in the lower section of the building after the rails are pinned and slip clips are lubricated. Any rails requiring alignment following this action will be determined after the safety tests are completed. The contractor shall provide a ride analyzer to record the actual ride information following the safety tests.

2.02 RAIL BRACKETS

The existing rail brackets shall be reused in place. All brackets shall be checked for secure fastening. Any missing hardware shall be replaced. The rail clips contact surface shall be lubricated.

2.03 RAIL BRACKET SUPPORTS & RAIL SUPPORTS AT PIT FLOORS

The existing rail bracket support and rail backing shall be reused. All supports shall be checked for proper fastenings and any necessary refastening shall be done to provide secure fastenings. The support bolts at the bottom of the rails shall be adjusted for a maximum clearance of one-half inch to allow for downward movement of the rails. On completion of the full load test after modernization these clearances shall be checked and readjusted if necessary.

2.04 BUFFERS-Spring

The existing spring buffers shall be reused in place. The buffers and pit channels shall be thoroughly cleaned.

All buffer supports shall be checked for secure fastening.

The applicable buffer tests shall be performed in accordance with code requirements.

2.05 CAR FRAME ASSEMBLY

The car frame assembly shall be reused. All frame members shall be checked for proper fastenings. Missing fastenings shall be replaced with proper fastenings for the intended use.

When required, a balance frame shall be provided to allow for proper balancing of total assembly after all equipment and cables are attached in place. The balancing assembly shall be such that it can be mounted and contain adequate weights to keep pressure on roller guides to under fifty pounds of force per roller after balancing the assembly at midpoint of the hoistway. The elevators shall be located at the mid-point of travel and the top roller guide removed or loosened so they do not touch the rails and the car balance checked and adjusted.

2.05 PLATFORM

The existing platform shall be reused. The platform shall be checked for proper clearance for movement on the isolation. No fixed solid brackets or equipment mounting shall interfere with the ability to move on the isolation.

A new code required proper length toe guard shall be provided and securely mounted to the entrance sill. Proper support for the toe guard shall be provided to prevent excessive deflection.

2.6 SLIDE GUIDES – NEW

The existing slide guide assemblies to be replace. The guides shall be replaced. The slide guides shall be proper aligned to the rail surfaces. Any missing or broken parts of the assemblies shall be replaced.

2.7 PIT LADDERS - New

Pit ladder shall be replaced and meet applicable codes.

2.8 CABLE FASTENINGS - NEW

The existing cable fastenings shall be replaced. Cables shall be securely fastened with approved devices in compliance with code requirements. Cable tags shall be applied to the cables near the fastenings and be marked with the required data. All cables do not have proper identified information on them and some do not have cable tags.

All cables being replaced shall be provided with new code approved cable fastenings.

Anti-rotational of the cable fastening wedges shall be provided. Horizontal and vertical movement shall not be restricted.

2.9 PUMP UNIT - New – Jack assembly to be aligned for smooth operation of the elevator Pump Unit (Valve, Motor, Tank and Pump – EECO and or approved vendor

Sound isolation pads shall be installed beneath the machine bedplate to reduce vibration and noise transmission to the building structure. Mount the pump unit on sound isolation pads, and provide complete sound isolation from the building in all directions.

2.10 DOOR OPERATOR-NEW

A new master door operator utilizing closed loop feedback control shall be furnished to open and close the car and hoistway door panels simultaneously. The controls shall provide for limited door reversal motion on re-opening. Door motion shall be electronically controlled throughout the full travel of the opening. The operator shall have a motor of proper size, a minimum of one-half horsepower, for handling door reversal during the closing cycles in a smooth motion within two and one-half inches of travel. The operator shall be of sufficient design to provide the opening and closing times as specified in the NEII Building Transportation Standards Guidelines. The operator shall operate with a minimum of noise though the full operating cycle. The preferred operator is the manufacturer's own best model. The new door operator will have a door restrictor.

2.11 DOOR COUPLER-NEW

A new mechanical coupler to connect the car and hoist-way door panels shall be provided. The operation of the coupler shall provide driving motion of the hoist-way door panels for full open and close directions. The drive rollers or blades shall remain engaged to prevent separation of the hoist-way door panels from the driven car door panels. The coupler shall be of such design to provide the restricted opening requirements of the code.

2.12 CAR DOOR CONTACTS-NEW

The elevator car door shall be equipped with a new approved electric contact which shall prevent the operation of the elevator driving machine by the normal operating mode unless the car door is in a closed position (as defined by applicable code) except when the elevator is either stopped or stopping. Car door contacts shall be so located that they are not readily accessible from the inside of the elevator opening.

2.13 CAR DOOR, CAR DOOR HANGER, HANGER & TRACK-NEW

New door hanger and track shall be provided for each set of car doors. The hanger and rollers shall be designed for high-speed power operation with minimum noise. They shall have provisions for vertical and lateral adjustments. Hanger shall be designed for two-point suspension of each door panel. Hanger rollers shall be spaced as close to the ends of the door panels as possible to reduce excessive movement of the door panels. The roller shall have a resilient surface and pre-lubricated sealed bearings. Hangers shall be provided with up-thrust adjustments to prevent rollers from being removed from the tracks unless the up-thrusts are loosened. The track shall be a shaped finished surface to fit the roller profile and of adequate strength to properly support the door panels and periphery equipment without deflection of the track. Door guides to be replaced.

2.14 HOISTWAY DOOR HANGERS & TRACKS - NEW

The existing door hangers and tracks shall be replaced for each hoistway entrance.

2.15 HOISTWAY DOOR INTERLOCKS-NEW

A new electro-mechanical interlock shall be provided for each hoist-way entrance. The interlock system shall be a tested and approved system to comply with the applicable codes. The interlocks shall prevent operation of the elevator to leave an opening unless the doors are in a closed and locked position as defined by applicable codes.

2.16 HOISTWAY DOOR UNLOCKING DEVICES - NEW

Emergency devices and keys for opening all hoist-way doors from the landing side shall be provided at all terminal floors. The existing hoistway escutcheons shall be reused on all floors.

2.17 DOOR CLOSERS---NEW

Each door shall be provided with a reel type automatic closing device. The device shall be capable of closing the hoist-way doors from any position of the opening when they are not connected to the car door through the door coupler. The device shall not require electrical power to perform the closing operation. The existing sill closers shall be removed.

2.18 DOOR PROTECTION DEVICES---NEW

The car door shall be provided with a new protective device that detects an object in the path of the closing doors at such a distance that reversal of the doors can be provided without physical contact of the detector (**with 3D option or beam extend into the hoistway 9-12 inches, with lighting**). The device shall provide this operation for a minimum of the lower two-third of the opening height. All protection devices that do not extend to the top of the car door shall have a blank extension that matches the door protection device face material from the top of the device to the top of the door panel

The device shall include detector units that provide protection across the entire opening. The arrangement of the operation shall be to maintain the doors in a full open position if the doors are open and the detectors interrupted. Should the doors not be obstructed and in the closing motion the reversal shall be dependent on the detector assembly to allow continuous closing until minimum distance to the object of interruption is reached. An automatic adjustable timed cutout shall be provided should the detector become obstructed for an extensive period of time.

Door nudging shall be initiated when the detectors are constantly interrupted for the timed cutout period of time.

A distinctive buzzer shall sound, the detector door control shall be over-ridden and the doors shall commence closing action at a reduced speed. Should the reason for the nudging action be removed the doors shall continue to close but at normal speed and normal detector action shall be restored.

2.19 CONTROLLER-NEW

Approved Vendors (GAL or Smartrise)

The controller shall be designed to control the starting, stopping, acceleration and deceleration of the elevator. It shall contain means for protection from excessive current to the motor. The controller shall automatically remove power, apply the brake electrically, and bring the elevator to rest in response to the operation of any of the protective safety devices. Electro-mechanical contactors shall be used to provide code required safety circuit protection. These contactors shall be mounted on a vibration absorbing panel to eliminate or reduce vibration to the logic portion of the controls. The contactor shall not be used to interrupt heavy currents during normal operation. Normal contactor action shall be done at zero current. All switches and contactor shall be mounted for easy access, and only approved rated contactors shall be used.

All control wiring shall be neatly formed and properly secured. The wiring shall be of the flameresistant type. The terminals shall have suitable means of identification to facilitate testing and repairs. The identification markings shall be coordinated with identical markings on the wiring diagrams.

No mechanical timers shall be used. All timers shall be of the electronic type and field adjustable. The circuits at the terminals shall be arranged so accidental grounding does not defeat the safety circuits. Also, the terminals shall be arranged to prevent adjacent terminal shorts will eliminate a safety device circuit. All power supplies shall be properly filtered. Short circuit protection shall be provided.

2.20 SIGNAL LOGIC-MICROPROCESSOR

The signal logic shall be a microprocessor-based system. All individual car logic and hall logic shall be done by utilizing solid state boards and microprocessor logic. The system shall be of the manufacturer's latest design, but not a prototype system.

Diagnostic lights shall be clearly visible on solid state boards. The system shall contain diagnostic capability. No system utilizing removable diagnostic equipment shall be accepted without the diagnostic equipment being furnished to the owner as part of the equipment.

All inputs to the microprocessor assembly shall be through proper isolation. Outputs shall be isolated and designed to handle required current and voltage loads. Power supplies shall be properly filtered and voltage levels designed to accommodate a ten percent line voltage variation without losing regulation or overheating. All components shall be commercially available.

Circuit boards shall be moisture resistant, non-corrosive and fabricated from noncombustible material, and of adequate thickness to support the mounted components.

2.21 DUPLEX OPERATION

All dispatching feature shall be selected automatically to meet the passenger traffic demand.

The system shall monitor:

- Position of the elevator.
- Direction of the elevator.
- Door status of the elevator.

Number of car calls and destination.
Number of available elevators.
Operational status of the elevator.
Corridor calls and their location/direction.
Assigned calls.
Waiting interval of each call.
Mode of operation.
Motion of the elevator

The system shall contain but not be limited to the following features:

Elevator Parking—Specified parking floors or areas.

The system shall provide for continuously changing operation in various peak traffic situations which include predominantly one-way, intense directional traffic with opposite direction traffic, balanced two-way traffic, light traffic and occasional traffic. All traffic analysis shall be done by optimization and call allocation. All program changes shall be selected automatically.

The system operations shall change continuously by demand and not rely on a forced method of programming.

The system shall be capable of being readily programmed to suit varying building requirements.

All diagnostic equipment shall be built into the control cabinets or provided to the owner as part of the base system. No required diagnostic equipment shall be removed from the elevator machine room

Full load by pass –Elevators loaded to a pre-determined level shall not be assign to landing calls in both directions until the elevator load has decreased below the pre-set level. All bypassed calls shall remain activated and shall be answered when the load in the elevator has been decreased to accept additional passengers the assignment may be made to this elevator.

Direction reversal – An elevator without registered car calls arriving at a floor where both up and down corridor are registered shall initially respond to the corridor call in the direction that the elevator was traveling and, if no car call is registered for future travel in the arriving direction, the elevator shall reverse the travel preference and respond to the corridor call in the opposite direction. Lantern operation shall always correspond to the next direction of elevator travel.

Programmed door control – Door open time intervals shall be programmed to match the prevailing passenger transfer condition as follows:

Corridor Call Stops
Car Call Stops
Door Re-open Interval
Lobby or Main Floor Interval
Nudging Interval

Corridor Button Automatic Cutout – In the event that a corridor button is stuck or damaged causing a constant registration and cannot be successfully canceled it shall automatically be removed from the assignment process for an adjustable period of time after which another attempt can be made to assign and cancel it.

Traffic Intensity – The system shall have the ability to assign elevator in accordance with the traffic requirements for low traffic, normal two-way traffic, intense traffic in one way, or peak traffic. These demands shall be changed by the intensity of traffic and not be time forced.

2.22 INDEPENDENT SERVICE OPERATION

A key operated switch, or toggle switch in a locked panel, shall be provided for selecting independent service operation of an elevator. When the switch is in the "on" position, all previously registered elevator calls for that elevator shall canceled and an attendant shall be required to operate the devices for elevator operation.

The elevator shall park with its door open. The closing of the door and starting of the elevator shall be subject to constant pressure on a floor button, or start button, after registration of a call, until the doors are fully closed and motion started. If the button is released prior to full closing of the door, the door shall reopen.

After the elevator is in motion, the button may be released and the elevator shall proceed to the first available registered car call. When stopping at the selected stop all car calls shall be cancelled to allow the operator to again make a selection of a desired floor for the next operation.

An elevator operating on independent service shall not respond to registered corridor calls. The car lantern shall not illuminate when the elevator is on independent service to eliminate waiting passenger confusion.

When the switch is restored to the "off" position, the elevator shall be restored to normal operation.

2.23 HOISTWAY ACCESS-NEW

Key operated switches shall be furnished in the hoistway entrance jamb or in a separate fixture adjacent to the jamb at the top floor of each elevator for hoistway access. A key protected switch shall be provided in the car operation panel to place the elevator on access control.

Operation of hoistway access switches, after initiation by car operating switch, shall operate the elevator with the hoistway door open at the respective floor where the key switch is operated and allow access to the hoistway. Rail mounted switches shall be provided to limit the elevator travel to comply with code.

2.24 FIREFIGHTER SERVICE -NEW

The elevators shall be equipped with devices and circuits to provide firefighter's service in full compliance with applicable codes in effect as of the date of this specification.

A smoke sensing device shall be installed at all floors except the main egress floor and such other locations as required by the local codes. The smoke sensing devices and installation shall be furnished by others.

Smoke sensing devices installed and wired by contractor shall be equipped with a dry contact and shall be wired to the elevator machine rooms by others. The connection from this point in the machine rooms shall be connected to the elevator control system circuits by the elevator contractor.

Phase One and Phase Two operation shall be provided. Locality standard keys shall be used and shall operate both the Phase One and Phase Two key switches. These keys shall not operate any other devices and no other key shall operate these switches.

It shall be the responsibility of the elevator contractor to provide the correct service for the location of the project.

2.25 CAR TOP INSPECTION-NEW

A new inspection station shall be provided on top of the car for operation of the car at low speed by authorized personnel. The station shall contain an inspection switch, up and down buttons with a safety button and a run/stop switch. Protective guards shall be around the motion buttons to prevent accidental operation of the buttons.

When the car top inspection switch is placed in the inspection position, the car shall be placed in inspection operation. The car shall move in either direction at a low rate of speed (not to exceed one hundred and fifty feet per minute) with constant pressure applied to the direction button and the safety button providing all doors are closed and the car safety circuit is intact. Releasing the buttons shall cause the car to stop immediately. Positioning the run/stop switch in the stop position shall render all controls inactive.

A car top light switch and power outlet shall be provided. These devices may be a part of the inspection station.

2.26 WIRING-NEW

All new interconnection wiring between machine room equipment shall be furnished and installed in proper duct or conduit as required. The wiring shall be of the type as required for the equipment furnished.

All new wiring shall be furnished between the hoistway and machine room equipment and shall be installed in accordance with applicable codes. A minimum of five percent properly identified spares shall be included.

Duct and conduit that meets quality and applicable codes may be reused. New duct or conduits shall be provided where necessary.

Each hoistway shall be checked for clearance between the existing duct and car platforms or mountings on the car frame. A minimum of three quarters of an inch of clearance shall be maintained. Currently some ducts are very close to contact in their present position.

All power wiring in the machine room shall be new wiring of proper size and type for the equipment furnished. All wiring shall be copper with proper coating throughout the complete system.

The hoistway door interlock system wiring shall be new SF-2 high heat resistant wiring. All other new wiring shall have flame retarding and moisture resistant outer covering. All new wiring shall contain Underwriters Laboratories labels.

All wiring shall be in strict accordance with good wiring practices and in compliance with applicable codes.

Any elevator wiring duct in the transformer rooms that is missing some covers shall be provided with covers. Locate the missing covers or furnish and install new covers.

2.27 TRAVELING CABLES-NEW

All traveling cables shall be new and properly suspended between the car and hoistway or machine room support. All cables shall incorporate the proper size and type of conductors to connect the equipment furnished. At a minimum each traveling cable shall contain four shielded and jacketed pair and one coaxial cable. Cables shall be supported by steel supporting strands. The cable shall hang in such a manner that both sides are in parallel to each other. The outer covering shall be fire resistant and meet Underwriters Laboratories standards. The cable shall be hung free of contact from hoistway walls or equipment and the elevator car except points of suspension. All cables shall contain a minimum of ten percent spares in each cable.

2.28 LIMIT SWITCHES-NEW

New normal and final terminal stopping switches shall be provided at each terminal. The actuating levers shall have roller with rubber or other composition tread to provide silent operation when actuated by the cam.

The terminal stopping switches shall provide and cause the elevator to stop automatically from any speed obtained under normal operation at a distance within the top and bottom over travel distances, independent of the normal operating devices. The current elevators have a terminal motion switch box and a cam. Should this be reused the cam must be checked to be sure it is straight and a new roller with a resilient surface provided on the box arm for silent operation.

Actuation of the final switches shall cause the elevator controls to remain inactive and prevent any further operation until the elevator has been manually caused to move away from the limits.

2.29 PIT SWITCHES-NEW

New stop switches shall be provided and installed in each elevator pit and at the entry point of the pit access ladder. One switch shall be accessible from the pit access door or pit ladder. Adequate switches to comply with code requirements are to be furnished. The switches shall be so connected as to cause all power to be removed from the elevator controls circuits causing the elevator to stop or remain stopped when the switch is actuated. The switches shall contain guards to prevent accidental tripping action.

2.30 CAR OPERATING PANEL-NEW – (Vandal Resistant)

The existing front return panel shall be removed and a new front return panel provided. The return panel shall incorporate the full car operating panel. The new panel shall have proper type of fastenings to prevent any noise when in a full locked position.

The panel shall contain floor call buttons corresponding to the number of floors served, plus the standard devices of door open, door close, alarm button, emergency stop button (unless it is not allowed by governing authority), independent service key switch, fan switch and a light switch at a minimum.

The standard required cluster of devices, to comply with handicap accessibility, shall be located at a centerline height of thirty-five inches from finished cab floor. All standard required devices and floor call buttons shall also be located at a height to meet handicap requirements and have handicap indications on the buttons or adjacent to them.

Appropriate firefighter's service key switch, light jewel, fire and call cancel button, shall be provided in car operating panel. (Under a locked panel)

An emergency light unit shall be either included in the car operating panel or located elsewhere in the car enclosure to provide the required illumination when a loss of normal power to the elevator is lost. A test button shall be provided in the car operating panel to test the emergency light. Should the light lens be in the car panel it shall be a flush lens.

A digital position indicator shall be provided in the car operating panel. The position indicator shall provide a clear display showing the location of the elevator in the hoistway. The illuminated indicator shall be a minimum of three inches in height.

Appropriate key switches for operating functions of the system provided shall be provided and clearly identified for their function.

The finish of the panel shall match the cab interior entrance column finish.

The finish of the panel shall be a number four stainless steel finish.

There will be a key switch for the rear door to lock out.

2.31 HALL LANTERNS-NEW

The lantern light shall be of adequate intensity to clearly indicate the direction of travel. The gong shall be replaced with a synthetic type sound that is adjustable to obtain the desired level of sound in the corridor when the lantern is illuminated.

The lantern shall illuminate and the gong sound as the elevator responds to a landing call. The lantern shall remain illuminated until the doors start to close. The lantern shall not illuminate and the gong shall not sound when the elevator is operating under a condition where corridor calls are not accepted for a response.

2.32 POSITION INDICATORS-NEW

An electronic readout type position indicator shall be provided to give a visual indication of the car position in the main car operating panel.

As the elevator travels through the hoistway, the numeral corresponding to the floor at which the elevator is stopped or passing shall be displayed on the position indicator. The indicator shall be formed by dot matrix, bar segment, or light emitting diodes (LED) type of display. Incandescent bulbs shall not be used. Change from one number to another shall be instantaneous and complete.

The readout size indicators shall be three inches in height.

Approval of the type of indicator is required.

2.33 CORRIDOR CALL BUTTONS-NEW VANDAL RESISTANT

Single riser of corridor call buttons for the simplex shall be provided at each landing. The button assemblies shall consist of a single illuminated button for each terminal and two illuminated buttons at each intermediate floor. The illumination shall be of the L.E.D. type. All button faceplates are to be flush mounted or surfaced mounted to the wall surfaces. The finish of the cover plates shall be an Stainless Steel #4 finish.

The button shall be illuminated when it is pressed for the desired direction of travel and the action is registered in the control system. Illumination shall indicate acceptance of the call into the logic system of the controls. The buttons shall be identical to the floor call buttons in the car operating panels.

A firefighter's service switch assembly shall be provided at the fire recall floor(s) as required by applicable codes. Pictograph and instruction for fire service shall be engraved in the required cover plates.

2.34 ALARM BELL OR SIREN-NEW

The alarm bell or siren shall be located on the exterior of the elevator cab enclosure. The bell or siren shall be of adequate sound level (minimum 80dba at a distance of three meters) so it can alert someone of the emergency. The device shall be activated by an alarm button in the car enclosure or by action of the stop switch. The device shall be connected to the battery source of the emergency lighting or be provided with a separate battery source that can be tested. The battery shall be of a rechargeable type with long life expectancy.

2.35 EMERGENCY LIGHTING-NEW

The emergency lighting system shall be a rechargeable battery-operated system that is connected to the normal and emergency lighting supply. The system shall meet the specified or

code requirements for time duration and light intensity. The unit shall contain a test button to verify operation to occur when power fails. The unit shall contain provision for a compatible alarm bell or siren that will operate from the battery source and the device shall be included. A test button shall also be located in the car operating panel.

2.36 POWER LOSS- Elevators to operate on generator power

2.37 ADA PROVISIONS---Passenger elevators

The elevator equipment being provided shall be designed to conform to the applicable regulations in effect as of the date of this specification. These features shall include but not be limited to:

1. Raised numbers and symbols on car operating panels.
2. Raised numerals, Braille, and symbols on hoistway entrance jambs. Replace
3. Car operating panel devices located at proper height.
4. Audible floor passing signal.
5. Correct lantern operation.
6. Hand rail in the passenger elevator cabs at proper height.

2.39 TELEPHONE- NEW

A hands-free telephone shall be installed in the new car operating panel by the elevator contractor. The elevator contractor shall be responsible to provide a shielded and jacketed pair of wires to the telephone from a termination in the machine room.

2.40 CERTIFICATE FRAME-NEW

A certificate frame shall be provided for the local authority certificate. This frame may be part of the telephone box cover. In instances where the certificate can be kept on file and not in the elevator, engraving on the cover plate may be provided stating that the certificate is on file.

2.41 ENTRANCES

The hoistway doors and frames shall be reused. The hoistway door unlocking holes in the door panels are to be reused if compatible for the new door operating equipment. If not compatible, or cannot be adapted to the new equipment requirements, new holes are to be provided in the appropriate location and snap-in covers provided for the existing holes.

Sight guards on the leading edge of the door panels are to be reused. They are to be checked for secure fastening. Any missing or broken guards are to be replaced.

Floor numbers on the hoistway side of the hoistway doors shall be provided.

2.42 CAB INTERIOR (Bostoch or approved cab vendors)

Plastic-Laminate Wall Panels: Plastic laminate adhesively applied to 1/2-inch (13mm) fireretardant- treated particleboard with plastic-laminate panel backing complying with NEMA LD 3, Type BKV and manufacturer's standard protective edge trim. Panels have a flame-spread rating of 25 or less, when tested according to ASTM E 84. 6. LED fixtures and ceiling panels of translucent acrylic or other permanent rigid plastic complying with flammability requirements.

Polished Stainless Metal Ceiling: Flush panels, of metal indicated

Handrails: Manufacturer's standard handrails, of metal indicated, rear wall. Elevator Contractor to supply sample colors and finishes.

Flooring to be replaced Armstrong-Astello Floor Cream or approved equal

3.0 EXECUTION

3.01 HOISTWAY INSPECTION

Elevator contractor must verify conditions of hoistways, pits, and machine rooms; and inspect the support structure and services, to determine the conditions under which elevator work is to be

installed. The elevator contractor shall notify owner or his agent in writing of unsatisfactory dimensions or conditions. The elevator contractor shall not proceed with elevator installations until unsatisfactory dimensions and conditions have been corrected, or approved, in a manner acceptable to elevator contractor.

3.02 WELDED CONSTRUCTION

Welded connections may be provided for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance and replacement of worn parts. Comply with AWS standards for workmanship and for qualifications of welding operators.

3.03 COORDINATION

Coordinate elevator work with work of other trades, for proper time and sequence to avoid installation delays. Use benchmarks, lines and levels designated by owner, or their agent, to ensure dimensional coordination of the work.

3.04 SOUND ISOLATION

All new equipment furnished shall be mounted on vibration absorption mounts, designed to effectively prevent transmission of vibrations to structure, and thereby eliminate sources of structure borne noise from the elevator system.

3.05 ACCEPTANCE TESTING

The elevator contractor shall perform the final adjustments and tests during regular working hours.

- A. Upon nominal completion of each elevator installation, and prior to permitting use of elevator (either temporary or permanent), perform acceptance tests as required and recommended by applicable codes and governing authorities.
- B. Advise the owner, or their representative, and inspection department of governing agencies, in advance of dates and times tests are to be performed on elevators.

3.06 PROTECTION

Installer shall advise owner, or their agent, of recommended protection procedures to prevent damage and deterioration of completed elevator work.

3.07 INSPECTION

The owner, or their representative, shall be permitted to make periodic and final inspections of the work for compliance with contract documents. The contractor shall provide manpower necessary to assist during such inspections. The owner, or their representative, shall prepare and submit to the contractor the inspection reports describing incomplete or corrective work required to satisfy contract requirements.

3.08 SUBMITTALS ---MODERNIZATION

- A. The elevator contractor shall prepare all required drawings as listed, or as required, for the elevator equipment. Drawings requiring approvals shall be properly approved by the owner, or their representative, and other authority prior to fabrication and installation of the equipment.
- B. Shop Drawings-Electronic submissions unless noted.
 - 1. Manufacturer's brochure and information on the control equipment.
 - 2. New machine drawings and structure stamped drawing
 - 3. Operating Fixture detail drawings for car and corridor.
 - 4. Car Identification Numbers for Lobby.
 - 5. Any special requirement information for the intended equipment.
 - 6. Project schedule.
 - 7. Physical samples of all finish materials
- C. Calculations –

1. Heat emissions in machine room(s).
 2. Electrical loads include starting, accelerating, and running currents, including auxiliary loads.
 3. Power supply confirmation request form.
- D. Contractor shall submit electronically drawings, catalogs and catalog data of all new equipment to be furnished requiring approval.
- E. As soon as approval has been given, make any necessary revisions and submit electronically of approved drawings, information and schedules. Also supply to the field required information for performance of the work.
- F. All submittals shall be on dates sufficiently in advance of job progress requirements to afford ample time for checking. No claim for extension of contract time shall be granted the contractor by reason of their failure to comply with this requirement. All submittals shall be complete and shall contain all required and detailed information.
- G. Contractor shall check all submittals for conformity with contract specifications and correct any errors, omissions, or deviations before transmittal to owner. Specifications, catalogs, etc., submitted for approvals shall be properly labeled indicating specific application for which material or equipment is to be used. Catalogs, pamphlets, or other documents submitted shall describe the items for which approval is being requested. The information shall be specific and clearly identified.
- H. Contractor shall be responsible for correct quantities, dimensions, design of adequate connections, and details for satisfactory construction of all work and furnishing of materials for the work required by the intent of the contract documents, even if not indicated on submittals that that have been approved by owner or authorized representative.
- I. Owner, and authorized representative, shall check drawings for design only and approval of drawings, schedules, and catalogs shall not be construed as a complete check and shall not relieve contractor of their responsibilities as stated above.
- J. **If submittals differ from requirements of contract documents, contractor shall make specific mention of such differences in their letter of transmittal with a request for substitution**, together with their reason for same. If acceptable, suitable action shall be taken for proper adjustments reflecting the change. It is understood and agreed that specific written approval of substitute materials and/or methods is required before contractor can proceed with a substitution.
- K. No material shall be delivered until contractor has obtained written approval of shop drawings and other data enumerated in this section. Should materials or equipment be delivered before required approvals, contractor shall be liable for removal and replacement at no charge to owner, if material or equipment does meet intent of approved documents.
- L. By approving and submitting shop drawings and samples, the contractor thereby represents that they have determined and verified all field measurements, field construction criteria, materials, catalog numbers and similar data, or shall do so, and that they have checked and coordinated the shop drawings and samples with the requirements of the work as detailed in the contract documents.
- M. Prior to the final acceptance of the total project work, submit three copies of the following bound manuals and one electronic manual to the owner or authorized representative for review:
1. Operating Instructions: Printed or typewritten literature describing the function and operation of all controls.
 2. Maintenance Instructions: Printed or typewritten schedules of all required maintenance procedures and special lubricants.
 3. Wiring Diagrams: Full size, ladder type, complete "as built" wiring and single line diagrams showing the electrical connections, functions and sequence of operation of apparatus connected with the elevators, both in the machine room and in the hoistway, shall be furnished for each simplex elevator or for each

group of elevators at the time of final inspection and acceptance. Coded information is not acceptable.

Deliver to the owner five keys for each type of lock used to control the equipment or other operating function for the equipment furnished, including locked cabinets. Clearly identify the function of each type of key with a permanent tag.

3.09 APPROVALS

- A. All approvals for the elevator work covered by these specifications shall be done by the owner or their approved representative, who may be an employee, or contracted architect or consultant. All approvals shall be done in a timely manner and not unreasonably withheld without providing to the contractor a specific reason for delays or approval.
- B. All approvals for work by others shall be approved by the owner, or owner's representative, or the person designated to handle the subject portion of the project.
- C. Any delays in approval by Owner, or their representative, that affect the submitted schedule shall extend the schedule equivalent to the length of the approval delay.

3.10 PERFORMANCE

- A. The individual performance of like elevators shall be the same. Each elevator shall be adjusted for optimum performance and shall be within the following maximum limits:
- B. Door Open Speed—Minimum two feet per second average.
- C. Door Close Speed—Approximately one foot per second and in compliance with the forces allowed in the applicable codes.
Brake to brake time for contiguous floors of a distance not to exceed twelve feet of travel shall be less than 4.8 seconds for elevators of a speed greater than 300 feet per minute.
- D. Overall performance time from start of door close to a distance of a passenger being able to exit the elevator, for elevators described in the foregoing paragraph, shall be less than 9 (nine) seconds for forty-eight-inch center parting doors and 10.5 seconds for forty-eight-inch two speed doors.
- E. Floor stopping accuracy shall be within ¼ inch of exact level and leveling accuracy shall be maintained within 3/8 inch though loading and unloading conditions.
- F. Full speed shall be maintained within three percent of specified under all load conditions up to rated capacity.
- G. Noise level in the car enclosure shall be less than 55 decibel average during running operations and a maximum increase of three decibel average during door operation at a distance of one meter from floor and one meter from door panels.
- H. Ride quality shall be such that there are no sudden horizontal accelerations. The maximum allowable peak to peak acceleration shall be thirty mg. within the .25 to 10 hertz band width. These measurements shall be taken with an accelerometer sensing unit placed in the center of the elevator floor without any sound or vibration absorption material between the unit and the platform. All readings in excess of the allowable shall cause readjustment or realignment to correct the source or cause of the excessive readings. Refer to Section 2.01 for any rail alignment that may be required to accomplish the desired ride quality.
- I. These performance requirements and the NEII Performance Standards shall be the standard to which the performance will be measured. The more stringent of the performance requirements shall be required to be met.
- J. Should the contractor determine that the equipment they are proposing to furnish cannot comply with these performance requirements, the equipment shall not be installed without submission of a request for a variance and such variance granted.

3.11 WARRANTY

- A. Maintenance Service: The elevator contractor shall furnish an all-inclusive first quality maintenance and call-back service on each elevator after it is completed and placed in operation for a period of twelve (12) months, concurrent with warranty period. This service

shall consist of examinations of the equipment at a minimum of once a month. Service shall include adjustments, lubrication, cleaning, supplies and parts to keep the equipment in proper operation, except for such adjustments, replacement of parts or repairs made necessary by abuse, misuse or any other causes beyond the control of the elevator contractor. All work will be done by trained employees of the elevator contractor during regular working hours of the trade. Emergency call-back service shall be provided at no cost to the owner and included for all hours and days during the maintenance period.

- B. Thirty days before expiration of the twelve (12) month maintenance service, the elevator contractor shall schedule an inspection of the elevator equipment with the Owner or his representative. This inspection is to assure that the elevator equipment is in safe first-quality, operating condition and the equipment is operating in line with its original design. An authorized representative of the elevator contractor shall accompany the Owner or his representative.
1. Examinations and log: During the warranty maintenance period the elevator contractor shall maintain maintenance records as per ANSI A17.1 Code for each elevator. The records shall be located in the elevator machine room and be used to indicate all callbacks, repairs, replacement of parts, fire service test and adjustments performed by the mechanic each month. Each entry in the maintenance records shall be signed by the mechanic who performs the work and be kept up to-date at all times.

3.12 STAND-BY TIME

The elevator contractor **shall include one working day per elevator** of standby time, or car running time, to assist other contractors performing work in each passenger elevator hoistway.

3.13 OVERTIME

Include the required overtime to allow for shut down of the adjacent elevator(s) for the installation of hoistway screening. This shall be done during building closed hours. Include any required overtime to remove existing machine room equipment and hoist the new machine room equipment. All elevator hoistways requiring screening shall be done at one time.

3.14 PROPRIETARY TOOLS OR DIAGNOSTIC EQUIPMENT

Any diagnostic tools or equipment required for diagnostics, troubleshooting, or setting parameters that are not commercially available from other sources and required to provide proper maintenance must be provided to the owner as part of the purchased equipment. No tools or equipment shall contain software or components that will be time stamped to expire. Any subsequent calibration of the diagnostic tools shall be provided by the original supplier as necessary at a nominal charge.

The contractor shall furnish a duplicate set of programmed processor chips for the individual and group control system to the owner after final completion and acceptance of final operation of the elevators. These are to be kept by the building owner and not allowed to be removed from the premises by anyone.

3.15 MAINTENANCE

- A. All maintenance work shall be performed during regular working hours on regular working days, or as required by the maintenance contract by maintenance personnel. Modernization personnel shall only assist in case of an entrapment or emergency.

3.16 PAINTING

- A. All unpainted elevator equipment in the hoistway and machine room shall be properly painted with a minimum of one finish coat of paint with a hard semi-gloss finish.
- B. Factory painted equipment in the machine room should have all scratches and mars touched up with the same color and type of paint used by the factory.

- C. After final acceptance of the modernization work the machines shall be thoroughly cleaned and painted by the elevator contractor with a hard semi-gloss finish coat.
- D. After final acceptance of all modernization work and painting of the machines the machine room floor shall be painted Industrial Gray by the elevator contractor.

END OF SECTION 14 2100

**SECTION 22 1426.13
RETROFIT ROOF DRAINS**

PART 1 GENERAL

1.1 REFERENCE STANDARDS

- A. International Association of Plumbing and Mechanical Officials (IAPMO):
 - 1. PS 97-96 – Mechanical Cast Iron Closet Flanges – Pressure Test
- B. Single Ply Roofing Industry (SPRI):
 - 1. ANSI/SPRI RD-1 – Performance Standard for Retrofit Drains.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Olympic Hercules
- B. OMG, Inc.
- C. Zurn

2.2 RETROFIT ROOF DRAINS

- A. Retrofit Roof Drains:
 - 1. Size: To be determined by the Contractor based on actual field conditions.
 - 2. Compliance:
 - a. ANSI/SPRI RD-1.
 - b. IAPMO PS 97-96.
 - 3. Drain Body:
 - a. Material: PC/PET blend
 - b. Flange: 18-inch square.
 - c. Drain Stem Length: 9 inches
 - d. Flange Includes:
 - 1) Six 1-1/8-inch-long stainless steel studs.
 - 2) 12 pre-punched holes to secure flange.
 - e. Sump Area: Depressed.
 - 4. Strainer Dome:
 - a. Material: PC/PET blend.
 - b. Height: 4 inches.
 - c. Outside Base Diameter: 14 inches.
 - d. Inlet Area: 125 square inches.
 - 5. Clamping Ring:
 - a. Material: 0.125-inch aluminum.
 - b. Low profile.
 - c. Strainer Brackets: 2, to 5-1/2 inches high to secure strainer.
 - d. Bosses: 6, to accept studs on flange.
 - 6. Backflow Seal:
 - a. Compression Seal: Watertight, "RAC Seal" mechanical seal.
 - b. Material: Urethane and cast aluminum.
 - 7. Hardware:
 - a. Nuts: 6, stainless steel kep nuts, for studs.
 - b. Extender pipe to accommodate additional insulation.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove clamping ring, strainer dome, and bolts from existing roof drain assembly and discard.
- B. Clean existing drain leader pipe of bitumen, dirt, and debris.

3.2 INSTALLATION

- A. Install retrofit roof drains in accordance with manufacturer's instructions at locations indicated on the Drawings.

- B. Install retrofit roof drains into existing drain leaders in accordance with manufacturer's instructions.
- C. Install flashing in accordance with membrane roofing manufacturer's instructions.
- D. Install retrofit roof drains to provide watertight connection to existing plumbing and membrane roofing systems.

3.3 PROTECTION

- A. Protect installed retrofit roof drains to ensure that, except for normal weathering, retrofit roof drains will be without damage or deterioration at time of Substantial Completion.

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

- A. The contractor shall provide the labor, tools, equipment, and materials necessary to install grounding materials in accordance with the plans and as specified herein.
- B. This section includes solid grounding of electrical systems and equipment. It includes basic requirements for grounding for protection of life, equipment, circuits, and systems. Grounding requirements specified in this section may be supplemented in other sections of these specifications.
- C. Applications of electrical grounding and bonding work in this section include the following:
 - 1. Underground metal piping
 - 2. Underground metal water piping
 - 3. Underground metal and steel reinforced concrete structures
 - 4. Electrical power systems
 - 5. Grounding electrodes
 - 6. Separately derived systems
 - 7. Raceways
 - 8. Enclosures
 - 9. Equipment
 - 10. Foundation reinforcing steel

1.2 QUALITY ASSURANCE

- A. Codes and standards. Perform all work associated with grounding in compliance with applicable requirements of governing agencies having jurisdiction and in accordance with these plans and as specified herein.
 - 1. Electrical code compliance. Comply with applicable local electrical code requirements of the authority having jurisdiction, and National Electrical Code, latest edition (NEC) as applicable to electrical grounding and bonding, pertaining to systems, circuits and equipment. Use of conduit system for ground conductor shall not be allowed.
 - 2. Underwriters' Laboratories, Inc. (UL) compliance. Comply with applicable requirements of UL standards nos. 467, "Electrical Grounding and Bonding Equipment" and 869 "Electrical service Equipment" pertaining to grounding and bonding of systems, circuits and equipment. In addition, comply with UL standard 486A, "Wire Connectors and Soldering Lugs for use with Copper Conductors". Provide grounding and bonding products which are UL listed and labeled for their intended usage.
 - 3. Institute of Electrical Electronic Engineers (IEEE) Compliance. Comply with applicable requirements and recommended installation practices of IEEE

standards 80, 18, 141, and 142 pertaining to grounding and bonding of systems, circuits, and equipment.

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:

1. Adalet-Plm Div.; Scott Fetzer Co.,
2. Burndy Corp.
3. Cadweld Div.; Cooper Industries, Inc.
4. Eagle Electric Mfg. Co.
5. Ideal Industries, Inc.
6. Okonite Co.
7. O-Z/Gedney Co.

2.2 MATERIALS

A. Grounding and bonding products

1. Products. Of type indicated and of sizes and ratings to comply with NEC. Where types, sizes, ratings, and quantities indicated are in excess of NEC requirements, the more stringent requirements and the greater size, rating and quantity indications govern.

B. Wire and cable conductors

1. General. Comply with Division 16 section "Electrical Power Conductors and Cables". Conform to NEC table 8, except as otherwise indicated, for conductor properties, including stranding.
2. Equipment grounding conductor. Green insulated. copper.
3. Bare copper conductors. Conform to the following:
 - a. Solid conductors ASTM B-3.
 - b. Assembly of stranded conductors ASTM B-8.
 - c. Tinned conductors ASTM

C. Miscellaneous conductors

1. Ground bus. Bare annealed copper bars of rectangular cross section with 98 percent conductivity, rigidly attach to structure. Use standoff insulated attachment for isolated and low level DC systems.
2. Braided bonding jumpers. Copper tape, braided no. 30 gauge bare copper wire, terminated with copper ferrules.
3. Bonding strap conductor/connectors. Soft copper, 0.05 inch thick and 2 inches wide, except as indicated.

- D. Connector products
 - 1. General. Listed and labeled as grounding connectors for the materials used.
 - 2. Pressure connectors, high conductivity plated units.
 - 3. Bolted clamps. Heavy duty units listed for the application.
 - 4. Exothermic welded connections. Provided in kit form and selected for the specific types, sizes, and combinations of conductors and other items to be connected.
- E. Grounding Electrodes
 - 1. Ground rods. Copper clad steel with high strength steel core and electrolytic grade copper outer sheath, molten welded to core.
 - a. Size. 3/4 inch by 10 feet.
 - 2. Plate electrodes. Copper plates, minimum 0.10 inch thick, size as indicated.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General
 - 1. Ground electrical systems and equipment in accordance with NEC requirements except where the drawings or specifications exceed NEC requirements.
 - 2. Ground Rods. Locate a minimum of one rod length from each other and at least the same distance from any other grounding electrode. Interconnect all ground rods with bare conductors buried at least 24 inches below grade. Connect bare cable ground conductors to ground rods by means of exothermic welds. Make these connections without damaging the copper coating or exposing the steel. Use 3/4 inch by 10 foot ground rods. Drive rods until tops are 6 inches below finished floor or final grade except as otherwise indicated.
 - 3. Metallic water service pipe. Provide insulated copper ground conductors, sized as indicated, in conduit from the building main service equipment, or the ground bus, to main metallic water service entrances to the building. Connect ground conductors to the main metallic water service pipes by means of ground clamps. Where a dielectric main water fitting is installed, connect the ground conductor to the street side of the fitting. Do not install a grounding jumper around dielectric fittings. Bond the ground conductor conduit to the conductor at each end.
 - 4. Route grounding conductors along the shortest and straightest paths possible without obstructing access or placing conductors where they may be subjected to strain, impact, or damage, except as indicated.

5. Bond interior metal piping systems and metal air ducts to equipment ground conductors of pumps, fans, electric heaters, and air cleaners serving individual systems.
6. Footer ground. Fabricate with 20 feet of conductor laid lengthwise in excavation for foundation or footings. Install so conductor is within 2 inches of the bottom of the concrete. Where base of foundation is less than 20 feet in length, coil excess conductor at base of foundation. Bond conductor to reinforcing steel at four locations, minimum. Extend conductor below grade and connect to building grounding grid or grounding electrode.

B. Connections

1. General. Make connections in such a manner as to minimize possibility of galvanic action or electrolysis. Select connectors, connection hardware, conductors, and connection methods so metals in direct contact will be galvanically compatible.
 - a. Use electroplated or hot tin coated materials to assure high conductivity and make contact points closer in order of galvanic series.
 - b. Make connections with clean bare metal at points of contact.
 - c. Aluminum to steel connections shall be with stainless steel separators and mechanical clamps.
 - d. Aluminum to galvanized steel connections shall be with tin plated copper jumpers and mechanical clamps.
 - e. Coat and seal connections involving dissimilar metals with inert material such as red lead paint to prevent future penetration of moisture to contact surfaces.
2. Exothermic welded connections. Use for connections to structural steel and for underground connections except those at test wells. Install at connections to ground rods and plate electrodes. Comply with manufacturer's written recommendations. Welds that are puffed up or that show convex surfaces indicating improper cleaning are not acceptable.
3. Terminate insulated equipment grounding conductors for feeders and branch circuits with pressure type grounding lugs. Where metallic raceways terminate at metallic housings without mechanical and electrical connection to the housing, terminate each conduit with a grounding bushing. Connect grounding bushings with a bare grounding conductor to the ground bus in the housing. Bond electrically noncontinuous conduits at both entrances and exits with grounding bushing and bare grounding conductors.
4. Tighten grounding and bonding connectors and terminals, including screws and bolts, in accordance with manufacturer's published torque tightening values for connectors and bolts, Where manufacturer's torquing requirements are not indicated, tighten connections to comply with torque tightening values specified in UL 486A and UL 486B.
5. Compression type connections. Use hydraulic compression tools to provide the correct circumferential pressure for compression connectors. Use tools and dies recommended by the manufacturer of the connectors. Provide embossing die code or other standard method to make visible indication that a connector has been adequately compressed on the ground conductor.

6. Moisture protection. Where insulated ground conductors are connected to ground rods or ground buses, insulate the entire area of the connection and seal against moisture penetration of the insulation and cable.

3.2 APPLICATION

- A. Equipment grounding conductor application. Comply with NEC article 250 for sizes and quantities of equipment grounding conductors, except where larger sizes of more conductors are indicated. Use of conduit system for equipment ground conductor shall not be allowed.
 1. Install separate insulated equipment grounding conductors with circuit conductors for the following in addition to those locations where required by code:
 - a. All conduits
 2. Busway circuits, install separate insulated equipment ground conductor from the ground bus in the switchgear, switchboard, or distribution panel to the equipment ground bar terminal on the Busway.
 3. Nonmetallic raceways. Install an insulated equipment ground conductor in nonmetallic raceways.
 4. Air duct equipment circuits. Install an insulated equipment grounding conductor to duct mounted electrical devices operating at 120 volts and above including air cleaners and heaters. Bond the conductor to each such unit and to the air duct.
- B. Underground conductors. Bare, tinned, stranded copper except as otherwise indicated.
- C. Separately derived systems required by NEC to be grounded shall be grounded in accordance with NEC, article 250.
- D. Connections to lightning protection system. Bond grounding conductors or grounding conductor conduits to lightning protection down conductors or grounding conductors in compliance with "NFPA 78" lightning protection code, latest edition.
- E. Provide grounding and bonding of all foundation reinforcing steel.

3.3 FIELD QUALITY CONTROL

- A. Tests. Subject the completed grounding system to a fall-of-potential test at each location where a maximum ground resistance level is specified, at service disconnect enclosure ground terminal, at ground test wells. Measure ground resistance without the soil being moistened by any means other than natural precipitation or natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by the two point method in accordance with section 9.03 of IEEE 81, "Guide for Measuring Earth Resistivity, Ground Impedance and Earth Surface Potentials of a Grounding System". Simple moisture addition is not acceptable. Submit written report of all measured ground resistances.
- B. Ground/resistance maximum values shall be as follows:

1. 4 ohms
- C. Deficiencies. Where ground resistances exceed specified values, and if directed, modify the grounding system to reduce resistance values.
- D. Report. Prepare test reports, certified by the testing organization, of the ground resistance at each test location. Include observations of weather and other phenomena that may affect test results. Describe measures taken to improve test results.

Submit test results to the engineer.

END OF SECTION

**SECTION 26 05 29
SUPPORTING DEVICES**

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes secure support from the building structure for electrical items by means of hangers, supports, anchors, sleeves, inserts, seals, and associated fastenings.

1.2 QUALITY ASSURANCE

- A. Components and installation shall comply with NFPA 70 "National Electrical Code", latest edition (NEC).
- B. Electrical components shall be listed and labeled by UL, ETL, CSA, or other approved, nationally recognized testing and listing agency that provides third-party certification follow-up services.

PART 2 - PRODUCTS

2.1 COATING

- A. Supports, support hardware, and fasteners shall be protected with zinc coating or with treatment of equivalent corrosion resistance using approved alternative treatment, finish, or inherent material characteristic. Products for use outdoors shall be hot-dip galvanized.
 - 1. Expansion anchors to be carbon steel wedge or sleeve type.
 - 2. Toggle bolts to be all steel springhead type.
 - 3. Power-driven threaded studs to be heat-treated steel, designed specifically for the intended service.

2.2 CONDUIT SEALING BUSHINGS

- A. Factory-fabricated watertight conduit sealing bushing assemblies suitable for sealing around conduit, or tubing passing through concrete floors and walls. Construct seals with steel sleeve, malleable iron body, neoprene sealing grommets or rings, metal pressure rings, pressure clamps and cap screws.

2.3 U-CHANNEL SYSTEMS

- A. U-channel systems to be 12 gage steel channels, with 9/16-inch-diameter holes, at a minimum of 8 inches on center, in top surface. Provide fittings and accessories that mate and match with u-channel and are of the same manufacture.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install supporting devices to fasten electrical components securely and permanently in accordance with NEC requirements.
- B. Coordinate with the building structural systems and with other electrical installation.
- C. Raceway supports shall comply with the NEC and the following requirements:
 - 1. Conform to manufacturer's recommendation for selection and installation of supports.
 - 2. Strength of each support shall be adequate to carry present and future load multiplied by a safety factor of at least four. Where this determination results in a safety allowance of less than 200 lbs., provide additional strength of each support.
 - 3. Install individual and multiple (trapeze) raceway hangers and riser clamps as necessary to support raceways. Provide U-bolts, clamps, attachments, and other hardware necessary for hanger assembly and for securing hanger rods and conduits.
 - 4. Support parallel runs of horizontal raceways together on trapeze-type hangers.
 - 5. Support individual horizontal raceways by separate pipe hangers. Spring steel fasteners may be used in lieu of hangers only for 1-1/2" and smaller raceways serving lighting and receptacle branch circuits above suspended ceilings only. For hanger rods with spring steel fasteners, use 1/4 inch diameter or larger threaded steel. Use spring steel fasteners that are specifically designed for supporting single conduits.
 - 6. Space support for raceways in accordance with table I of this section. Space supports for raceway types not covered by the above in accordance with NEC.
 - 7. Support exposed and concealed raceway within 1 foot of an unsupported box and access fittings. In horizontal runs, support at the box and access fittings may be omitted where box or access fittings are independently supported and raceway terminals are not made with chase nipples or threadless box connectors.
 - 8. In vertical runs, arrange support so the load produced by the weight of the raceway and the enclosed conductors is carried entirely by the conduit supports with no weight load on raceway terminals.
 - 9. Vertical conductor supports to be installed simultaneously with installation of conductors.
 - 10. Support miscellaneous electrical components as required to produce the same structural safety factors as specified for raceway supports. Install metal channel racks for mounting cabinets, panelboards, disconnects, control enclosures, pull boxes, junction boxes, transformers, and other devices.

11. Install sleeves in concrete slabs and walls and all other fire-rated floors and walls for raceways and cable installations. For sleeves through fire rated-wall or floor construction, apply UL-listed fire stopping sealant in gaps between sleeves and enclosed conduits and cables in accordance with "Fire Resistant Joint Sealers".
 12. Install seals for conduit penetrations of slabs on grade and exterior walls below grade and where indicated. Tighten sleeve seal screws until sealing grommets have expanded to form watertight seal.
- D. Unless otherwise indicated, fasten electrical items and their supporting hardware securely to the building structure, including but not limited to conduits, raceways, cables, cabinets, panelboards, transformers, boxes, disconnect switches, and control components in accordance with the following:
1. Fasten by means of wood screw or screw-type nails on wood, toggle bolts on hollow masonry units, concrete inserts or expansion bolts on concrete or solid masonry, and machine screws, welded threaded studs, or spring-tension clamps on steel. Threaded studs driven by a power charge and provided with lock washers and nuts may be used instead of expansion bolts and machine or wood screws.

Do not weld conduit, pipe straps, or items other than threaded studs to steel structures. In partitions of light steel construction, use sheet metal screws.
 2. Holes cut to depth of more than 1-1/2 inches in reinforced concrete beams or to depth of more than 3/4 inch in concrete shall not cut the main reinforcing bars. Fill holes that are not used.
 3. Ensure that the load applied to any fastener does not exceed 25 percent of the proof test load. Use vibration and shock-resistant fasteners for attachments to concrete slabs.

Table 1 appears on the following page.

Table I: Spacing for raceway supports

Raceway	No. Of Conductors In Run	Location	Max Spacing Of Supports (Feet)	
Horizontal Runs				
1/2, 3/4	1 or 2	Flat Ceiling or wall	GRC 5	EMT 5
1/2, 3/4	1 or 2	Where it is difficult to provide supports except at intervals fixed by the building construction.	GRC 7	EMT 7
1/2, 3/4	3 or more	Any Location	GRC 7	EMT 7
1/2 - 1	3 or more	Any location	GRC 6	EMT 6
1 and larger	1 or 2	Flat ceiling or wall	GRC 6	EMT 6
1 and larger	1 or 2	Where it is difficult to provide supports except at intervals fixed by the building construction.	GRC 10	EMT 10
1 and larger	3 or more	Any location	GRC 10	EMT 10
Any		Concealed	GRC 10	EMT 10
Vertical Runs				
1/2,3/4		Exposed	GRC 7	EMT 7
1, 1-1/4		Exposed	GRC 8	EMT 8
1-1/2 and larger		Exposed	GRC 10	EMT 10
Up to 2		Shaftway	GRC 14	EMT 10
2-1/2		Shaftway	GRC 20	EMT 10
3 and larger		Concealed	GRC 10	EMT 10

- E. Support for cables shall be independent of conduits, pipes, ceiling grid supports, raceways, or their supports.

END OF SECTION

**SECTION 26 05 33
RACEWAYS**

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes raceways for electrical wiring. Types of raceways in this section include the following:
1. Flexible metal conduit
 2. Liquid tight flexible conduit
 3. Rigid metal conduit
 4. Intermediate steel conduit
 5. Wiremold
 6. EMT electrical metallic tubing ANSI C80.3
- B. The following Division 26 section contain requirements that relate to this section:
1. "Electrical Power Conductors and Cables" for other wiring methods
 2. "Supporting Devices" for other wiring methods
 3. "Cabinets, Boxes and Fittings" for boxes used with conduit and tubing systems.
- C. Electrical components and installation shall comply with NFPA 70 "National Electrical Code", latest edition.

1.2 NEMA COMPLIANCE

- A. Comply with applicable requirements of NEMA standards pertaining to raceways.
1. Rigid steel conduit ANSI C80.1
 2. Intermediate steel conduit
 3. Liquid tight flexible metal conduit and fittings U360 specifically approved for this raceway.
 4. Flexible metal conduit U1
 5. EMT electrical metallic tubing ANSI C80.3
- B. Comply with applicable requirements of US standards pertaining to electrical raceway systems. Provide raceway products and components listed and labeled by UL, ETL, or CSA.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the work if applicable include, but are not limited to, the following:
1. Conduit:
Wheatland
Allied
LTV

Triangle

2. Conduit bodies:

Adalet-PLM
American Electric
Appleton Electric Co.
Carlton
Crouse-Hinds Division, Cooper Industries, Inc.
Killark Electric Mfg. Co.
O-Z/Gedney

2.2 METAL CONDUIT AND TUBING

- A. Rigid steel conduit: ANSI C80.1.
- B. Intermediate steel conduit: UL 1242.
- C. Electrical metallic tubing (EMT): ANSI C80.3
- D. Liquidtight flexible metal conduit and fittings: UL360. Fittings shall be specifically approved for use with this raceway.
- E. Minimum conduit size shall be 3/4 inch trade size.

2.3 NONMETALLIC CONDUIT AND DUCTS

- A. Rigid nonmetallic conduit (RNC): NEMA TC 2 and UL 651, schedule 40 and 80 PVC.
- B. PVC conduit and tubing fittings: NEMA TC 3; match to conduit or conduit/tubing type and material.
- C. PVC and ABS plastic utilities duct fittings: NEMA TC9; match to duct type and material.
- D. Liquidtight flexible nonmetallic conduit and fittings: UL 1660. Fittings shall be specifically approved for use with this raceway.
- E. Conduit, tubing, and duct accessories: types, sizes, and materials complying with manufacturer's published product information. Mate and match accessories with raceway.

2.4 CONDUIT BODIES

- A. General: type, shapes, and sizes as required to suit individual applications and NEC requirements. Provide matching gasketed covers secured with corrosion-resistant screws.
- B. Metallic conduit and tubing: Use metallic conduit bodies. Use bodies with threaded hubs for threaded raceways.
- C. Conduit bodies 1 inch and smaller: Use bodies with compression-type EMT connectors for EMT.
- D. Nonmetallic conduit and tubing: Use nonmetallic conduit bodies conforming to UL 514 B.

PART 3 - EXECUTION

3.1 WIRING METHOD

- A. Outdoors: Use the following wiring methods:
1. Exposed: Galvanized rigid steel conduit.
 2. Concealed: Galvanized rigid steel conduit.
 3. Connection to vibrating equipment: Including transformers and hydraulic, pneumatic, or electric solenoid or motor-driven equipment: Liquidtight flexible metal conduit.
 4. Indoors or outdoors: Connection to vibrating equipment and hydraulic, pneumatic, or electric solenoid or motor-driven equipment in moist or humid location or corrosive atmosphere, or where subject to water spray or dripping oil, grease, or water: Liquidtight flexible metal conduit.
 5. Underground to be PVC Schedule 40 with GRC turn ups and elbows. Minimum 36 inches below grade. Feeders shall be encased in a 4 inch red concrete envelope. Branch circuits shall have 12 inch premium fill envelope. Provide a metal backed yellow "Caution" ribbon six inches below grade in all trenches.
- B. Indoors: Use the following wiring methods:
1. Connection to vibrating equipment: Including transformers and hydraulic, pneumatic or electric solenoid or motor-operated equipment: Liquidtight flexible metal conduit unless noted otherwise. For lighting fixture connections above the process ceiling, Type MC cable is acceptable for wiring from the fixture up to the junction box at the structural steel level.
 2. Concealed: EMT
 3. Exposed in equipment rooms: EMT
 4. Exposed to damage: Galvanized rigid steel conduit.
 5. In all coolers, production areas, process areas, hose down areas and all refrigerated areas: Stainless Steel raceway system.

3.2 INSTALLATION

- A. General: Install electrical raceways in accordance with manufacturer's written installation instructions, applicable requirements of NEC, and as follows:
- B. Conceal all raceways unless indicated otherwise within finished walls and ceilings. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot water pipes. Install raceways level and square and at proper elevations.
- C. Elevation of raceway: Coordinate the installation with all trades.
- D. Complete installation of electrical raceways before starting installation of conductors within raceways.

- E. Provide supports for raceways as specified elsewhere in Division 26.
- F. Prevent foreign matter from entering raceways by using temporary closure protection.
- G. Protect stub-ups from damage where conduits rise from floor slabs. Arrange so curved portion of bends is not visible above the finished slab.
- H. Make bends and offsets so the inside diameter is not effectively reduced. Unless otherwise indicated, keep the legs of a bend in the same plane and the straight legs of offsets parallel.
- I. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings except as otherwise indicated.
- J. Run concealed raceways with a minimum of bends in the shortest practical distance considering the type of building construction and obstructions except as otherwise indicated. This does not apply to conduits in crawl spaces.
- K. Install exposed raceways parallel and perpendicular to nearby surfaces or structural members and follow the surface contours as much as practical.
- L. Run exposed, parallel, or banked raceways together. Make bends in parallel or banked runs from the same center line so that the bends are parallel. Factory elbows may be used in banked runs only where they can be installed parallel. This requires that there be a change in the plane of the run such as from wall to ceiling and that the raceways be of the same size. In other cases provide field bends for parallel raceways.
- M. Join raceways with fittings designed and approved for the purpose and make joints tight. Where joints cannot be made tight, use bonding jumpers to provide electrical continuity of the raceway system. Make raceway terminations tight.

Where terminations are subject to vibration, use bonding bushings or wedges to assure electrical continuity. Where subject to vibration or dampness, use insulating bushings to protect conductors.
- N. Tighten set screws of threadless fittings with suitable tool.
- O. Terminations: Where raceways are terminated with locknuts and bushings, align the raceway to enter squarely and install the locknuts with dished part against the box. Use two locknuts, one inside and one outside the box.
- P. Where terminating in threaded hubs, screw the raceway or fitting tight into the hub so the end bears against the wire protection shoulder. Where chase nipples are used, align the raceway so the coupling is square to the box, and tighten the chase nipple so no threads are exposed.
- Q. Install pull wires in empty raceways. Use no. 14 AWG zinc-coated steel or monofilament plastic line having not less than 200-lb. tensile strength. Leave not less than 18 inches of slack at each end of the pull wire.

- R. Telephone and signal system raceways 2-inch trade size and smaller: In addition to the above requirements, install raceways 2-inch and smaller trade size in maximum lengths at 150 feet and with a maximum of two, 90-deg. bends or equivalent. Install pull or junction boxes where necessary to comply with these requirements.
- S. Install raceway sealing fittings in accordance with the manufacturer's written instructions. Locate fittings at suitable, approved, accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points and elsewhere as indicated.
- T. Stub-up connections: Extend conduits through concrete floor for connection to free standing equipment with an adjustable top or coupling threaded inside for plugs and set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor. Where equipment connections are not made under this contract, install screwdriver-operated threaded flush plugs flush with floor.
- U. Flexible connections: Use short length (maximum of 6 ft.) of flexible conduit for recessed and semirecessed lighting fixtures, for equipment subject to vibration, noise transmission, or movement; and for all motors. Use Liquidtight flexible conduit in wet locations. Install separate ground conductor across flexible connections.
- V. Provide fire seal at all wall penetrations.
- W. Provide seal and flashing at all wall and ceiling penetrations in refrigerated areas or walls and ceilings connected/adjacent to refrigerated areas
- X. The minimum size conduit is ¾ inch trade size.

3.3 ADJUSTING AND CLEANING

- A. Upon completion of installation of raceways, inspect interiors of raceways; clear all blockages and remove burrs, dirt, and construction debris.

END OF SECTION

**SECTION 26 05 53
ELECTRICAL IDENTIFICATION**

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes identification of electrical materials, equipment, and installations. It includes requirements for electrical identification components including but not limited to the following:
 - 1. Buried electrical line warnings.
 - 2. Identification labeling for raceways, cables, and conductors.
 - 3. Operational instruction signs.
 - 4. Warning and caution signs.
 - 5. Equipment labels and signs.

1.2. QUALITY ASSURANCE

- A. Components and installation shall comply with NFPA 70 "National Electrical Code", latest edition.
- B. Comply with requirements of ANSI standard A13.1, "Scheme for the Identification of Piping Systems", with regard to type and size of lettering for raceway and cable labels.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by the following:
 - 1. Ideal Industries, Inc.
 - 2. Panduit Corp.
 - 3. Seton Name Plate Co.
 - 4. W. H. Brady Co.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Coordinate names, abbreviations, colors, and other designations used in electrical identification work with corresponding designations specified or indicated. Install numbers, lettering, and colors as approved in submittals and as required by code.
- B. Install identification devices in accordance with manufacturer's written instructions and requirements of NEC.
- C. Where identification is to be applied to surfaces that require finish, install identification after completion of finish work.

- D. Identify high-voltage feeder conduits (Over 600v) by words "Danger-High Voltage Keep Away" in black letters 2 inches high, stenciled at 10 foot intervals over continuous painted red background.
- E. Identify raceways of certain systems with color banding - band exposed or accessible raceways of all systems as directed for identification. Bands shall be pretensioned, snap around colored plastic sleeves, colored adhesive marking tap, or a combination of the two. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side. Install bands at changes in direction, at penetrations of walls and floors, and at 40 foot maximum intervals in straight runs. Apply colors as directed.
- F. Identify junction, pull, and connection boxes - code required caution sign for boxes shall be pressure-sensitive, self-adhesive label indicating system voltage in black, preprinted on white background. Install outside of box cover. Also label box covers with identity of contained circuits. Use pressure-sensitive plastic labels at exposed locations and similar labels or plasticize card stock tags at concealed boxes.
- G. For exterior underground power, signal, and communication lines, install continuous underground plastic line marker, located directly above line at 6 to 8 inches below finished grade. Where multiple lines installed in a common trench or concrete envelope do not exceed an overall width of 16 inches; install a single line marker.
- H. Provide color coding for secondary service, feeder, and branch circuit conductors throughout the project secondary electrical system as follows:

<u>208/120 volts</u>	<u>phase</u>	<u>480/277 volts</u>
Black	A	Brown
Red	B	Orange
Blue	C	Yellow
White	Neutral	Gray
Green	Ground	Green

1. Use conductors with colors factory-applied the entire length of the conductors except as follows:
 2. The following field-applied color-coding methods may be used in lieu of factory-coded wire for sizes larger than no. 10 AWG. Apply colored, pressure-sensitive plastic tape in half lapped turns for a distance of 6 inches from terminal points and in boxes where splices or taps are made. Apply the last two laps of tape with no tension to prevent possible unwinding. Use 1 inch wide tape in colors as specified. Do not obliterate cable identification marking by taping. Tape locations may be adjusted slightly to prevent such obliteration.
- I. Power circuit identification: Securely fasten identifying metal tags or aluminum wraparound marker bands to cables, feeders, and power circuits in vaults, pull boxes, junction boxes, manholes, and switchboard rooms with 1/4 inch steel letter and number stamps with legend to correspond with designations on drawings. If metal tags are provided, attach them with approximately 55 lb test monofilament line or one-piece self-locking nylon cable ties.

Tag or label conductors as follows:

1. Future Connections - conductors indicated to be for future connection or connection under another contract with identification indicating source and circuit numbers.
 2. Multiple circuits - where multiple branch circuits or control wiring or communications/signal conductors are present in the same box or enclosure (except for three-circuit, four-wire home runs), label each conductor or cable. Provide legend indicating source, voltage, circuit number and phase for branch circuit wiring. Phase and voltage of branch circuit wiring may be indicated by means of coded color of conductor insulation. For control and communication/signal wiring, use color coding or wire/cable marking tape at terminations and at intermediate locations where conductors appear in wiring boxes, troughs, and control cabinets. Use consistent letter/number conductor designations throughout on wire/cable marking tapes.
 3. Match identification marking with designations used in panelboards, shop drawings, contract documents, and similar previously established identification schemes for the facility's electrical installations.
 4. Apply warning, caution, and instruction signs and stencils as follows:

Install warning, caution, or instruction signs where required by NEC, where indicated, or where reasonably required to assure safe operation and maintenance of electrical systems and of the items to which they connect. Install engraved plastic-laminated instruction signs with approved legend where instructions or explanations are needed for system or equipment operation. Install signs with metal backing for outdoor items.
 5. Apply a 2" wide yellow band on all emergency conduits and raceways.
- J. Emergency operating signs - install engraved laminate signs with white legend on red background with minimum 3/8 inch high lettering for emergency instructions on power transfer, load shedding, or other emergency operations.
- K. Apply equipment identification labels of engraved plastic-laminate on each major unit of electrical equipment in building, including central or master unit of each electrical system. This includes communication/signal/alarm/power systems, unless unit is specified with its own self-explanatory identifications. Except as otherwise indicated, provide signal line of test, with 1/2 inch high lettering of 1-1/2 inch high label (1 inch high where two lines are required), white lettering in black field. Text shall match terminology and numbering of the contract documents and shop drawings. Apply labels for each unit of the following categories of electrical equipment:
1. Panelboards, electrical cabinets, and enclosures
 2. Access doors and panels for concealed electrical items
 3. Electrical switchgear and switchboards
 4. Motor starters
 5. Pushbutton stations
 6. Power transfer equipment
 7. Contactors
 8. Remote-controlled switches
 9. Control devices
 10. Transformers
 11. Power generating units
 12. Telephone switching equipment

13. Fire alarm master station or control panel

- L. Apply circuit/control/item designation labels or engraved plastic laminate for disconnect switches, breakers, pushbuttons, pilot lights, motor control centers, and similar items for power distribution and control components above. For panelboards, provide frames, typed circuit schedules with explicit description and identification of items controlled by each individual breaker.
- M. Fire alarm conduits and boxes: Fire alarm conduits, except surface raceways in finish areas, shall receive a 2" wide red band every 10'-0". All fire alarm junction and wiring boxes shall be painted red and labeled "Fire Alarm" with label types specified in this section.

END OF SECTION

SECTION 26 08 00
AUTOMATIC TRANSFER SWITCHES

The transfer switches are furnished by the owner, installed and wired complete by the contractor

PART 1 - GENERAL

1.1 SCOPE AND RELATED WORK

- A. Furnish and install Automatic Transfer Switches (ATS) with number of poles, amperage and voltage as shown on drawings. Withstand and Close-on ratings as listed in this specification are provided as a minimum requirement. Transfer switches provided without UL 3 cycle and 30 cycle ratings shall not be acceptable.
- B. Related Work: this section shall be used in conjunction with related specification sections and related contract documents, including drawings, to establish the total requirements for the automatic transfer switches. Use of this section exclusively may result in the omission of basic requirements.

1.2 CODES AND STANDARDS

- A. The Automatic Transfer Switches and controls shall conform to the requirements of the following:
 - 1. UL 1008: Underwriters Laboratories Standard for Transfer Switch Equipment
 - 2. NFPA 70 National Electrical Code
 - 3. NFPA 99 Essential Electrical Systems for Health Care Facilities
 - 4. NFPA 110 Standard for emergency and standby power systems
 - 5. ANSI/IEEE 446 Recommended Practice for Emergency and Standby Power Systems for Commercial Applications
 - 6. NEMA ICS 10 P1 Industrial Control and Systems Part 1: Electromechanical AC Transfer Switch Equipment
 - 7. IBC-2006 International Building Code-Seismic Certified
 - 8. UL 508 Standard for Industrial Control

1.3 SUBMITTALS

- A. Submittals shall be provided in accordance with the contract documents. Submittals shall include the manufacturer's original data sheets and detailed shop drawings. Shop drawings shall include a detailed specification sheet listing the project name, supplier, and a description of each item supplied. The description shall include model number, voltage, number of poles, and enclosure type. Submittals shall include schematic wiring diagram, complete dimensions information, and a listing of accessories proposed for each item. In

order to avoid confusion, all drawings shall be accurate and specific for the equipment being supplied. Marked up generic drawings are not acceptable.

- B. Operation and maintenance data shall be supplied after shipment in accordance with the contract documents.

1.5 INSTALLATION, OPERATION AND MAINTENANCE DATA

The manufacturer shall supply three (3) copies of installation, operation and maintenance manuals to the owner after delivery of the equipment.

1.6 WARRANTY

- A. The automatic transfer switch shall be provided with a two year warranty, covering all parts, labor, travel and expenses during the first two years, followed by three years of replacement parts coverage. Warranty shall commence on startup or six months from date of shipment, whichever occurs first. Warranty shall not be dependent upon customer purchase of additional equipment or preventive maintenance contracts.

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

- .A. Automatic Transfer Switch(es) shall be manufactured in the USA and shall be type RTS30 as supplied by Kohler, or approved equal

2.2 GENERAL

- A. Transfer switches shall be electrically operated and mechanically held with double throw construction. Ratings shall be as shown on the drawings.
- B. Switches shall be three pole type with solid neutral, or four-pole as indicated on the drawings. Where four pole switches are required, a true four pole switch shall be supplied, with all four poles mounted on a common shaft. The entire fourth pole assembly, including contacts, arc chutes, etc. shall be identical to the other power poles. The fourth pole shall be switched simultaneously with, and by the same mechanism as, the main power poles. The short circuit rating of the fourth pole shall be identical to the ratings of the main power poles. The complete assembly shall be factory tested to ensure proper operation and compliance with the specifications requirements. Overlapping neutral designs are not acceptable.
- C. The transfer switch shall be mounted in a NEMA 1 enclosure, unless otherwise indicated on the drawings. Enclosures shall be fabricated from 12-gauge steel. The enclosure shall be sized to exceed minimum wire bending space required by UL 1008, even when compression lugs are provided. The enclosure shall allow for either top or bottom conduit entry, or any combination of both.

- D. The transfer switch(es) shall be seismic certified, capable of operating successfully after being subjected to a minimum IBC 200% g Earthquake Test. Testing shall be performed and verified by an independent, A2LA accredited, testing laboratory, in accordance with IBC 2006. Any additional bracing, structural changes, and/or accessories required to pass seismic testing shall be included. Certification must be obtained via actual shake table testing. Certification by calculation only is not acceptable.
- E. The automatic transfer switch shall be capable of transferring successfully in either direction with 70% of rated voltage applied to the switch terminals.
- F. Where open transition transfer switches are indicated, the Source 1 and Source 2 contacts shall be positively interlocked mechanically and electrically to prevent simultaneous closing. Designs relying on electrical interlocks only are not acceptable. Main contacts shall be mechanically locked in both the positions without the use hooks, latches, magnets or springs. Main contacts on all size switches shall be segmented with tungsten arcing tips. Contacts shall be machined from solid copper. Separate arcing contacts with magnetic blowouts shall be provided on all transfer switches. Interlocked molded case circuit breakers or contactors are not acceptable.
- G. All open transition transfer switches shall be equipped with a safe manual operator designed to prevent injury to operating personnel. The manual operator shall provide the same contact to contact transfer speed as the electrical operator to prevent a flash-over from switching the main contacts slowly. Manual operation shall not require prior disconnection of electrical operators or control wiring, and shall be safe even if the electrical operator becomes energized during manual operation. The manual operator shall be external type, operable through the door of the enclosure. Safe manual transfer shall be possible under all load conditions, either energized or non-energized.
- H. The automatic transfer switch shall be double throw, actuated by one or two electrical operators, momentarily energized, and connected to the transfer mechanism by a simple over-center type linkage providing inherent quick break, quick make operation when operated electrically or manually.
- I. For large motor and transformer switching applications, and for transfer switches used for load shedding, where indicated by the "dual" operator designation on the drawings, the transfer switch(es) shall be double throw, actuated by two electrical operators. The adjustable time delay between the opening of the closed contacts and the closing of the open contacts shall allow the loads to be demagnetized before transfer. The dual operator transfer switch(es) shall allow the motor and transformer loads to be re-energized after transfer with normal inrush current. The manufacturer shall have a minimum of 5 years experience in building dual operators style switches. In phase monitor or sync check designs shall not be acceptable.
- J. All bolted bus connections shall have Belleville compression type washers.

- K. All control components and wiring shall be front accessible. All control wires shall be multiconductor 18 gauge 600-volt SIS switchboard type point to point harness. All control wire terminations shall be identified with tubular sleeve-type markers.
- L. The switch shall be equipped with 90 degrees C rated copper/aluminum solderless mechanical type lugs, unless otherwise indicated on the drawings. If compression lugs are indicated on the drawings, these lugs shall be supplied by the ATS supplier, and the UL listing of the switch shall not be compromised.

2.3 CONTROLLER

- A. The transfer switch shall be equipped with a Microprocessor Controller with a Power Supply Module, CPU and I/O Modules. The Microprocessor shall be identical for all voltage and ampere ratings. The controller shall be capable of serial communications (standard) or Ethernet communications (optional).
- B. The controller shall contain voltage sensing modules capable of direct single phase or three phase sensing of each source from 120 VAC to 600 VAC. The Power Supply Module shall accept a 24 VDC external power source allowing controller communications in the event of a power outage.
- C. Voltage sensing shall be true RMS type and accurate to +/- 1% of nominal voltage. Frequency sensing shall be accurate to +/- 0.05Hz. The operating temperature range shall be -20 to +50 degrees C and storage from -40 to +90 C.
- D. The controller shall connect to the transfer switch through an interconnecting wiring harness. Interfacing relays shall be provided to isolate the controller from abnormal voltages applied to any and all customer input and output wiring terminals.
- E. All customer interface connections shall be wired to a common DIN rail Cage Clamp terminal block. Sufficient space shall be provided to allow for future modifications and upgrades.
- F. The controller shall meet or exceed the requirements for Electromagnetic Compatibility as follows:
 - 1. EN55022 (CISPR11) Conducted and Radiated emissions, Class B
 - 2. EN61000-4-2 (Level 4) ESD immunity test
 - 3. EN61000-4-3 (ENV50140) Radiated RF
 - 4. EN61000-4-4 Electrical fast transient/burst immunity test
 - 5. EN61000-4-5 IEEE C62.41 Surge immunity test
 - 6. EN61000-4-6 (ENV50141) Conducted immunity test
 - 7. EN61000-4-11 Voltage dips and interruption immunity
 - 8. IEEE 472 (ANSI C37.90A) Ring wave immunity

G. Controller Display and Keypad

1. A color, ¼ VGA minimum, graphical display shall be provided for viewing data and setting operational parameters. Parameters shall also be available for viewing remotely and limited control through a front accessible USB communications port. All programming functions shall be pass code protected. All programming functions shall be pass code protected.
2. The Controller shall provide high intensity LED's for the following:
 - a. Source Availability - Indicates the source voltage and frequency are within pre-set parameters.
 - b. Source Connected - Indicates the source main contacts closed and the load being served from the source.
 - c. XFER Inhibit - Indicates that the ATS is being inhibited from automatic operation to the unconnected source.
 - d. Alarm: Indicates an alarm condition is active.
 - e. TD Active: Indicates that a transfer switch time delay is actively timing.
3. For ease of navigation, the display shall include the following:
 - a. Soft Keys – Change function based on user location in the menu structure.
 - b. Dedicated Navigational Keys – Home, Scroll Up, End, Escape and Enter.
 - c. Dedicated Pushbuttons for Alarm Reset, Test, Control and Information.

H. Voltage, Frequency and Phase Rotation Sensing

1. The transfer switch controller has programmable voltage and frequency sensing of both Source 1 and Source 2, and shall be capable of detecting a single or three phase losses. The Controller shall have adjustable pickup and dropout settings for each source. Set point ranges for both Source 1 and Source 2 shall be as follows:

<u>Parameter</u>	<u>Dropout/Trip</u>	<u>Pickup/Reset</u>
Under-voltage	72 to 100%	70 to 98%
Over-voltage	100 to 108%	102 to 110%
Under-frequency	45.1 to 60.0 Hz	45.0 to 59.9%
Over-frequency	50.0 to 69.7 Hz	50.1 to 69.8 Hz

2. The controller shall monitor phase rotation of both sources and inhibit transfer if both sources are not the same phase rotation. Source rotation shall be field selectable as either ABC or CBA.

3. Settings shall be adjustable in 1% increments either through the keypad, USB port or remotely via communications.
 4. A single source status screen shall be provided to allow for viewing of the status of both sources including three phase voltage, power and frequency.
- I. Time Delays: The transfer switch controller shall provide the following time delays:
1. The controller shall include an adjustable time delay of 0 to 10 seconds to momentarily override Source 1 power outages and to delay engine starting. The time delay shall be expandable up to 60 minutes if an external 24 VDC power supply is provided for ATS control.
 2. The controller shall include an adjustable 0 to 60 minute time delay on transfer to Source 2, factory set at 3 seconds.
 3. The controller shall include a time delay on retransfer to the preferred source adjustable 0 to 259 minutes, factory set at 5 minutes.
 4. The controller shall include a time delay on engine cool down adjustable 0 to 60 minutes, factory set at 5 minutes.
 5. All time delays shall be adjustable in 1second increments. All time delays shall be adjustable via the graphical display, the front USB port or configuration software using the USB, serial or Ethernet communications port.

2.4 ADDITIONAL FEATURES AND ACCESSORIES

- A. Test Switch – The controller shall be provided with a two position, password protected, test switch to simulate a Source 1 failure. The test mode shall be configurable for Test Without Load or Test With Load functionality. The Test function shall be activated via the pushbutton on the display or remotely via a dry contact, voltage signal or a network signal.
- B. Engine Start Signal – A SPDT contact, rated 10 amps at 30 VDC, shall be provided to start the engine generator in the event of a Source 1 outage or customer initiated test.
- C. Source connected contacts rated 10 amps at 120 VAC shall be provided to signal when the ATS is connected to each source. Provide a quantity of two contacts for ATS in Source 1 position and two for ATS in Source 2 position each ATS position.
- D. Source Connected LED's - The controller shall include LED's to indicate when the ATS is connected to each source.
- E. Source Availability LED's and Contacts - The controller shall include LED's to indicate the availability of each source. In addition, two voltage free form "C" contacts shall be provided

to indicate availability of Source 1, and two voltage free form “C” contacts shall be provided to indicate availability of Source 2. The lights and relays shall provide true source availability indication, as determined by the voltage sensing settings for each source.

- F. Commit/No-Commit Transfer Selector – The controller shall include a programmable selector to configure the controller to commit, or not to commit, to transferring the load to Source 2 in the event the Source 1 power returns prior to Source 2 being ready to accept load.
- G. Inhibit Transfer Signals – The controller shall be capable of accepting transfer control inputs that inhibit transfer of the ATS to either source for load control purposes for use with generator control switchgear.
- H. Auto/Manual Selector – The controller shall include a programmable function to select either Automatic or Manual operation.
- I. ATS/Engine Exerciser: The controller shall include a user configurable exerciser. Exerciser shall be configurable for daily, 7 day, 14 day or 28 day exercise periods, each with (7) programmable events. The exerciser shall also be configurable as a full, 365 day exerciser with up to 24 independent exercise events. Each event shall be configurable for Test with Load and Test Without Load. Each event shall include user adjustable start time, date and test duration. All time and date settings shall be stored in non- volatile EEPROM memory. The controller shall include full programmability for daylight savings time.
- J. Diagnostics: The controller shall contain self and system diagnostic screens for the purpose of detecting and troubleshooting abnormal system events.
- K. Communications Interface: The controller shall be capable of interfacing via serial/RS485 or optional Ethernet TCP/IP communications ports integral to the controller. All communications parameters (baud rate, parity, IP Address, etc.) shall be accessible and programmable via the front keypad. Both serial and Ethernet communication shall be *Modbus* open protocol.
- L. Event Logger: The controller shall have the ability to log data and to maintain the last 256 events, even in the event of a power failure. Time and date stamping of events will be accurate to 1 ms. Controller shall be capable of synchronizing its date/time setting with a main PC via Network Time Protocol over an Ethernet TCP/IP network connection.

The following events shall be time and date stamped:

1. Last Primary Source Failure
2. Last reason for transfer.
3. Last transfer to alternate source
4. Last retransfer to primary source
5. Time load is without power
6. Time ATS powered up

7. Total time on source 1
8. Total time on source 2
9. Total number of primary source failures
10. Total number of transfers

M. Communications Modules

1. Serial Communications: Controller shall support RS485 communications port to enable serial communications at baud rates up to and including 115.2Kbps and be user configurable. The serial communications shall be capable of a direct connect or multi-drop configured network.
2. Ethernet Communications: Where indicated on the drawings, the controller shall be capable of supporting an optional Ethernet TCP/IP communications, in lieu of the standard serial communications, via an internally mounted and self powered communications card. Ethernet shall be 10/100 MBit, auto sensing and include an RJ45 network connector.
3. Open Protocol: Both serial and Ethernet communications shall be *Modbus* protocol. Proprietary communications protocols shall not be acceptable.
4. External Power Supply: The controller shall be capable of being connected to an external 24 VDC power supply to permit full operation and communications of the controller when both sources are de-energized.
5. Auto Load Shed: The controller shall be capable of being programmed to automatically shed the connected load in the event of a user configurable under frequency condition.
6. Customer Configurable Alarms – The controller shall be capable of being configured to display customer configured alarm points. Alarms shall be capable of being reset via a remote contact or the front panel RESET pushbutton.

Additional 4 Form “C” contacts to indicate ATS in Emergency position.

Pre-transfer signal – supply 4 Form “C” time delay contacts that change state simultaneously 0-3600 seconds before transfer in either direction and revert 0-3600 seconds after transfer is completed

2.5 WITHSTAND RATINGS

- A. The transfer switch shall be UL listed in accordance with UL 1008 for 3 and 30 cycle close and withstand ratings. Switches that are not tested and labeled by UL for 3 and 30 cycle ratings are not acceptable. The minimum UL listed close and withstand ratings at 480 VAC shall be as follows:

<u>Size Amps</u>	<u>3 Cycle</u>	<u>30 Cycle</u>	<u>Current Limiting Fuses</u>
100 – 400	42 Ka	30 Ka	200,000 Ka
600 – 800	65 Ka	42 Ka	200,000 Ka
1000 – 1200	85 Ka	65 Ka	200,000 Ka
1600 – 3000	100 Ka	85 Ka	200,000 Ka
4000	125 Ka	100 Ka	200,000 Ka

- B. During 3 cycle and 30 cycle closing and withstand tests, there shall be no contact welding or damage. The 3 cycle and 30 cycle test shall be performed without the use of current limiting fuses. The tests shall verify that contact separation has not occurred, and there is contact continuity across all phases. Test procedures shall be done in accordance with UL-1008, and testing shall be certified by Underwriters Laboratories, Inc.
- C. In accordance with UL-1008, after completion of the short time closing and withstand testing, the same sample shall successfully pass the Temperature Test and the Dielectric Voltage-Withstand Test to verify the ability of the ATS to carry full rated current after completing the short time tests.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Transfer switch(es) shall be installed as indicated in accordance with the equipment manufacturer's written instructions, and recognized industry practices to ensure that system equipment complies with requirements of NEC and applicable portions of NECA's "Standard of Installation" pertaining to general electrical installation practices.
- B. The electrical contractor shall examine areas and conditions under which the transfer switch(es) shall be installed, and notify engineer in writing of conditions detrimental to proper completion of work.
- C. Coordinate with other electrical work, including cables, wires, raceways, electrical boxes and fittings as appropriate.
- D. Provide appropriate safety and arc flash labels, as required.

3.2 CONNECTIONS

- A. Wire to remote components: Match type and number of cables and conductors to control and wiring communication requirements of transfer switch(es) as recommended by the manufacturer.
- B. Ground equipment according to Division 26 section on Grounding and Bonding.
- C. Connect wiring according to Division 26 section on "Conductors and Cables."

- D. Tighten electrical connectors and terminals according manufacturer's published torque tightening values. If manufacturer's torque values are not available, use those as specified in UL486A and UL 486B.

3.3 SOURCE QUALITY CONTROL

- A. Prior to shipment, the transfer switch(es) shall be factory tested and inspected to ensure proper operation. Tests shall include voltage, frequency, and time delay settings for compliance with specifications.
- B. Manufacturer shall perform a dielectric test complying with NEMA ICS 1.

3.4 FIELD QUALITY CONTROL

- A. After installing the equipment, and after electrical circuitry has been energized, the installing contractor shall test for compliance with requirements, as follows:
 - 1. Perform each electrical test and visual and mechanical inspection stated in NETA ATS, section 7.22.3. Certify compliance with test parameters.
 - 2. Check for electrical continuity of circuits and for short circuits.
 - 3. Inspect for physical damage, proper installation and connection, and integrity of barriers, covers, and safety features.
 - 4. Verify manual transfer operation (if applicable).
 - 5. Simulate at least three power failures, verifying operation of transfer equipment from Source 1 to Source 2, and return to Source 1.
 - 6. Verify time delay settings as desired by the owner.
- B. Coordinate ATS testing concurrently with testing of engine generator, and run concurrently.
- C. After installation by contractor, the manufacturer's service engineer shall visit for final checkout and testing and for owner training, include a minimum of 3 separate site visits.

3.5 SERVICE AND SUPPORT

- A. The transfer switch manufacturer shall employ a nationwide, factory direct field service organizations. All field service personnel shall be direct employees of the manufacturer. Third party service organizations are not acceptable.
- B. The transfer switch manufacturer shall include an "800" telephone number for field service support. Support shall be available 24 hours a day, 365 days a year. The field service number shall be displayed on the outside of each enclosure.

- C. The manufacturer shall maintain complete records and schematic drawings, along with replacement parts, for all switches by serial number, for a minimum of 20 years.

3.6 POWER QUALITY METERING

- A. The ATS's shall be provided with optional metering for the parameters listed below. Metering shall be true RMS type, with 1% accuracy for voltage and 0.5% accuracy for currents. The transfer switch shall be provided with slid core current transformers with 5 amp secondary current. CT's shall be wired to a shorting block for safety purposes.

The following meter parameters shall be provided:

1. Phase current: Ia, Ib, Ic, In and average current (Iavg)
 2. Phase voltage: Va, Vb, Vc, Vab, Vac, Vbc
 3. Voltage and Current unbalance
 4. Hz, PF, W, Var, VA
 5. Wh, VAh, VARh
 6. Voltage and Current Harmonics (% THD up to 8th order)
 7. Phase Rotation Sensing
 8. Synchroscope (lead/lag)
- B. The ATS shall be capable of monitoring and capturing waveform data in the event of a utility power outage or other user specified event.
 1. A total of 10 active channels of waveform capture may be user configured.
 2. Each channel shall be capable of capturing up to 256 cycles of waveform information.
 3. Analog channels may be configured for 4, 8, 16 or 32 samples/cycle.
 4. Digital channels shall be configured for 1 sample/cycle.
 5. Waveform data shall be stored in industry standard COMTRADE format for broadest compatibility and ease of downloading to a PC.
 - C. The controller shall be capable of logging digital and analog measured parameters and storing the data in non-volatile memory.
 - D. The controller shall contain a 10 channel Data Logger. Each channel shall be capable of being configured to monitor a digital on/off or analog measured parameter.
 - E. The sampling rate of each channel shall be configurable from 1 cycle to 60 minutes per sample. The data shall be stored in non-volatile memory in a first in, first out method.

END OF SECTION

**SECTION 26 09 00
GENERATOR SET**

The Generator is furnished by the owner, installed and wired complete by the contractor

PART 1 - GENERAL

1.1 REFERENCE STANDARDS

- A. The generator covered by these specifications shall be designed, tested, rated, assembled and installed in strict accordance with current Editions of all applicable standards of:
- B. NFPA70 – National Electrical Code. Equipment shall be suitable for use in systems in compliance to Article 700, 701, and 702.
- C. NFPA99 – Essential Electrical Systems for Health Care Facilities
- D. NFPA110/Type10 - Emergency and Standby Power Systems. The generator set shall meet all requirements for Level 1 systems. Level 1 prototype tests required by this standard shall have been performed on a complete and functional unit, component level type tests will not substitute for this requirement.
- E. UL508A. The entire control system of the generator set shall be UL508A Listed and labeled.

1.2 INSTALLATION

- A. The work includes supplying and installing a complete integrated emergency generator system to provide an alternate source of power to the plant emergency load in the event of a utility outage. The system consists of a diesel generator set with related component accessories and automatic transfer switches.

1.3 FUEL SYSTEM

- A. The Fuel system shall be Natural Gas

1.4 SYSTEM TEST

- A. A complete system resistive @ 1.0 p.f after all equipment is installed.

1.5 REQUIREMENTS CODES AND REGULATIONS

- A. The equipment supplied and installed shall meet the requirements of the NEC current Edition, and all applicable local codes and regulations. All equipment shall be of new and current production by a MANUFACTURER who has over 60 years of experience building this type of equipment.

1.6 SUBMITTALS

- A. Engine-generator submittals shall include the following information:

1. Factory published specification sheet indicating standard and optional accessories, ratings, etc.
2. Manufacturer's catalog cut sheets of all auxiliary components such as isolators, battery charger, silencer, exhaust flex, main circuit breaker, etc.
3. Dimensional elevation and layout drawings of the generator set, enclosure and transfer switchgear and related accessories.
4. Engine mechanical data at varying loads up to full load, including heat rejection, exhaust gas flows, combustion air and ventilation air flows, noise data, fuel consumption, etc.
5. Generator electrical data including temperature and insulation data, cooling requirements, excitation ratings, voltage regulation, voltage regulator, efficiencies, waveform distortion and telephone influence factor.
6. Generator resistances, reactances and time constants.
7. Generator current decrement curve.
8. Generator motor starting capability.
9. Jacket water heater connection diagram.
10. Control panel schematics.
11. Automatic load transfer switch (es).
12. Oil sampling analysis, laboratory location, and information.
13. Manufacturer's and dealer's written warranty.
14. Emissions data

1.7 FACTORY PRODUCTION TESTING

- A. The system manufacturer must certify that engine; generator, controls, and switchgear have been tested as complete system of representative engineering models (not on equipment sold). The manufacturer shall supply equipment that is a current factory production model.
- B. The Generator Set shall be tested in accordance with the power, voltage, and frequency shown on the generator set information plate.

1.8 GENERATOR SET MANUFACTURER

- A. Caterpillar
- B. Kohler
- C. Cummins

1.9 REQUIREMENTS CODES AND REGULATIONS

- A. The equipment supplied and installed shall meet the requirements of the NEC, current Edition, and all-applicable local codes and regulations. All equipment shall be new, of current production. There shall be one source responsibility for warranty; parts and service through a local representative with factory trained service personnel.

1.10 AUTHORIZED DISTRIBUTOR

- A. The equipment supplier shall be the local authorized distributor for the product supplied.

1.11 AUTOMATIC TRANSFER SWITCHES

- A. The automatic transfer switch (es) specified shall be supplied by the engine-generator

manufacturer in order to establish and maintain a single source of system responsibility and coordination.

1.12 TWO YEAR WARRANTY

- A. The manufacturer's standard warranty shall in no event be for a period of less than two (2) years from date of initial start-up of the system and shall include repair parts, labor, reasonable travel expense necessary for repairs at the job site, and expendables (lubricating oil, filters, antifreeze, and other service items made unusable by the defect) used during the course of repair. Running hours shall not be a limiting factor for the system warranty by either the manufacturer or servicing distributor. Submittals received without written warranties as specified will be rejected in their entirety.

1.13 WARRANTY ADMINISTRATION

- A. The manufacturer's authorized dealer shall be capable of administering the manufacturer and dealer's warranty for all components supplied by the selling dealer.

1.14 SERVICE FACILITY

- A. The engine-generator supplier shall have service facilities within 50 miles of the project site and maintain 24-hour parts and service capability. The distributor shall stock parts as needed to support the generator set package for this specific project.

1.15 SERVICE PERSONNEL

- A. The dealer shall maintain qualified; factory trained service personnel that can respond to an emergency call within 4 hours of notification.

1.16 MAINTENANCE GUARANTEE

- A. The generator set supplier shall offer a maintenance and repair contract, which guarantees all support costs of the specified system. It shall include routine and 24 hour emergency access to a factory account manager to expedite emergency repairs.
- B. The contract shall protect the user from parts and labor price increases, and shall provide a refund of residual funds at any time of user dissatisfaction. Optional payment schedules shall include:
 - (1) fixed rate throughout the life of the contract.
 - (2) graduated rate, which increases the low initial cost throughout the life of the contract.
 - (3) deferred rate which delays contract payment until expiration of the standard warranty.
 - (4) lump sum discounted payment.

1.17 MECHANICS AND EQUIPMENT

- A. The generator set supplier shall have factory trained service representatives and tooling necessary to install, test, maintain, and repair all provided equipment.

1.18 PARTS AVAILABILITY – 90%

- A. The generator set supplier shall have sufficient parts inventory to maintain over the counter availability of at least 90% of any required parts.

1.19 PARTS AVAILABILITY – 100%

- A. The generator set supplier shall guarantee 100% parts availability within 48 hours from the time an order is entered with the dealer.

PART 2 – PRODUCTS

2.1 GENERAL

- A. The generator set shall be Emergency Standby rated as shown on the drawings, 208/120 volt, 3 phase, 4 wire, 60 hertz, including radiator fan and all parasitic loads and meet current EPA emissions regulations

2.2 BLOCK DESIGN

- A. The complete engine block shall be machined from one casting. Designs incorporating multiple blocks bolted together are not acceptable.

2.3 LUBRICATION SYSTEM

- A. The engine shall utilize a gear-type, positive displacement, full pressure lubricating oil pump and water-cooled lube oil cooler. Pistons shall be spray-cooled. Provide oil filters, oil pressure gauge, dipstick and oil drain.

2.4 COOLING SYSTEM

- A. The engine jacket water cooling system shall be a closed circuit design with provision for filling, expansion, and deaeration. The cooling pump shall be driven by the engine. Auxiliary coolant pumps required for heat exchangers or separate circuit aftercooling shall also be engine driven. The cooling system shall tolerate at least 172-kPa (25-PSI) static head. Coolant temperature shall be internally regulated to disconnect external cooling systems until operating temperature is achieved.

2.5 MOUNTED RADITOR

- A. The generator set shall be equipped with a rail-mounted, engine-driven radiator with blower fan and all accessories. The cooling system shall be sized to operate at full load conditions and 114° F ambient air entering the engine room without de-rating the unit and 50/50 anti-freeze mixture. The radiator shall be filled with an extended life coolant with a minimum estimated life of 6000 hours or 6 years. The coolant formula shall contain no phosphates or silicates, and it shall be recyclable. The generator set supplier is responsible for providing a properly sized cooling system based on the enclosure static pressure restriction.

2.6 GENERATOR SPECIFICATIONS

- A. The synchronous three phase generator shall be a single (double) bearing, self-ventilated, drip-proof design in accordance with NEMA MG 1 and directly connected to the engine flywheel housing with a flex coupling.

2.7 INSULATION

- A. The insulation material shall meet NEMA standards for Class H insulation and shall be UL1449 Recognized and CSA Certified, and shall be vacuum impregnated with epoxy varnish to be fungus resistant. Temperature rise of the rotor and stator shall not exceed 130⁰C rise by resistance over 40⁰ C ambient. The excitation system shall be of brushless construction.

2.8 WINDINGS

- A. The revolving field coils shall be precision wet layer wound with epoxy based material applied to each layer of magnet wire. Alternator pitch shall be 0.7333 to match existing generator and minimize total harmonic distortion. The field shall be prototype tested for two hours at 150% of rated speed at 70 degree C, and production tested at 125% of rated speed. It shall be dynamically balanced to 0.5 mil peak-to-peak. Stator shall have at least two dips and bakes using Class H impregnating varnish. Basic lightning impulse insulation level (BIL) shall not be less than 3 kV. Windings shall be tested at 3000 volts AC.

2.9 EXCITER – PERMANENT MAGNET

- A. The permanent magnet excitation system shall derive excitation current from a pilot exciter mounted on the rotor shaft. It shall enable the alternator to sustain 300% of rated current for ten seconds during a fault condition.

2.10 DIGITAL VOLTAGE REGULATOR

- A. The digital voltage regulator shall be microprocessor based with fully programmable operating and protection characteristics. The regulator shall be capable of sensing true RMS in three phases of alternator output voltage, or operating in single phase sensing mode. It shall exhibit the following operational characteristics:
 - Alternator output voltage maintained within +/- 0.25% at steady state conditions.
 - Alternator output voltage maintained within +/- 0.25% of rated value for any load variation between no load and full load.
 - Alternator output voltage drift no more than +/-0.25% of rated value at constant temperature.
 - Alternator output voltage drift no more than +/- 0.5% of rated value within a 40 degree C change over ambient temperature range of -40 degree C to 70 degree C.
 - Response time less than 20 milliseconds.
 - Voltage buildup with alternator output as low as 6 volts.
 - At full throttle engine starting, output voltage overshoot no more than 5% of its rated value, with respect to the volts/Hz curve. Meets ISO 8325-3 class G2 specifications.
 - Power dissipation 55 W at 15 amps; <100 ma at rest.
 - Telephone Influence Factor (TIF) of less than 50.
 - Electronic Interference/Radio Frequency Interference (EMI/RFI) suppressed to MIL STD 461C Part 9 and VDE 875 level N.
 - Maintain stable voltage control with 20% total harmonic distortion.
- B. The regulator shall include the following features:

1. Voltage level rheostat to provide alternator output voltage adjustment of -10% to +10% of nominal. This shall be in addition to a programmable output voltage level of -25% to +10%
2. Automatic gain adjustment to provide output voltage compensation for changes in load or frequency.
3. Manual gain adjustment 0 - 10% to provide compensation for line losses between alternator output terminals and the load.
4. Reactive droop adjustment programmable to allow paralleling without interconnect wiring between alternators, with 10% minimum droop at full load and 0.8 PF.
5. It shall allow system parameter setup and monitoring, and provide fault alarm and shutdown information through a keyed LCD display. A PC-based user interface shall be available to allow viewing and modifying operating parameters in a windowed environment. The regulator shall be factory preset but field programmable for:
 - a. voltage output
 - b. voltage, minimum
 - c. voltage droop/crosscurrent adjustment
 - d. voltage gain (IR compensation)
 - e. voltage gain, internal
 - f. current, output
 - g. field current variation
 - h. sensing, single or three phase
 - i. dual voltage/frequency slopes
 - j. slope intersect (knee) frequency
 - k. underfrequency set point
 - l. over/under voltage trip
 - m. over/under voltage trip time
6. In addition, the regulator shall have an optional version capable of incorporating and programming the following options:
 - a. PF/kVAR mode selection
 - b. PF reference
 - c. kVAR reference
 - d. reverse power trip
 - e. reverse power trip time
7. Alarms and fault shutdowns shall include:
 - a. Under/over voltage
 - b. Overexcitation
 - c. Loss of Excitation
 - d. Rotating Diode failure
 - e. Instantaneous Overcurrent Trip (IST)
 - f. Loss of Sensing
 - g. Loss of Frequency
 - h. EEPROM failure

- C. Protection shall be provided for the regulator against long term overcurrent conditions. Alternator output shall shut off when output is shorted, or excitation current exceeds normal for 15 seconds. The regulator shall not be damaged or result in unsafe operation when subjected to open or shorted input due to sensing loss, or sensing source shorted to ground or adjacent conductor.
- D. The regulator shall be capable of operating while mounted within the alternator assembly, or 300m (985 ft) from the alternator. It shall have provision for remote voltage level control, using 16 gauge shielded wire.
- E. The regulator module sealed in a waterproof and airtight shock resistant plastic housing and shall withstand:
 - 1. Operating temperatures between –40 degree C to 70 degree C.
 - 2. Shock tolerance to 20 g's
 - 3. Vibration of 4.5 g's (peak) between frequencies of 18 to 2000 Hz in three perpendicular planes, and mechanical shock of 15 g's in all three planes.
 - 4. Salt spray resistant as described by MIL STD-810C, Method
 - 5. 509.1 and ASTM-B117.
 - 6. Pressure sealed to withstand 35 kPa (5 PSI).
- F. The regulator shall be manufactured by the manufacturer of the engine-alternator set. The regulator shall be UL508A Listed.

2.11 WIRING AND CONDUIT

- A. Engine and generator control wiring shall be multi-strand annealed copper conductors encased by cross-linked polyethylene insulation resistant to heat, abrasion, oil, water, antifreeze, and diesel fuel. Wiring shall be suitable for continuous use at 120C (250F) with insulation not brittle at -50C (-60F). Each cable will be heat stamped throughout the entire length to identify the cable's origin and termination. Cables shall be enclosed in nylon flexible conduit, which is slotted to allow easy access and moisture to escape. Reusable bulkhead fittings will attach the conduit to generator set mounted junction boxes.

2.12 GENERATOR MOUNTED CONTROL PANEL

- A. Provide a generator mounted control panel for complete control and monitoring of the engine and generator set functions. Panel shall include automatic start/stop operation; adjustable cycle cranking, digital AC metering (0.5% true rms accuracy) with phase selector switch, digital engine monitoring, shutdown sensors and alarms with horn and reset, adjustable cool down timer and emergency stop push-button. Panel shall incorporate self-diagnostics capabilities and fault logging. Critical components shall be environmentally sealed to protect against failure from moisture and dirt. Components shall be housed in a NEMA 1/IP22 enclosure with hinged lid. Control panel shall be UL508A Listed

2.13 DIGITAL READOUTS

- A. Provide the following digital readouts:
 - 1. Engine oil pressure
 - 2. Coolant temperature

3. Engine RPM
4. System DC Volts
5. Engine running hours
6. Generator AC volts
7. Generator AC amps
8. Generator frequency
9. KW meter
10. Percentage of rated Power
11. KVA meter
12. KVAr meter
13. Power Factor meter
14. KWHR meter

2.14 ALARM NFPA 110

- A. Provide the following indications for protection and diagnostics according to NFPA 110 level 1:

1. Low oil pressure
2. High water temperature
3. Low coolant level
4. Overspeed
5. Overcrank
6. Emergency stop depressed
7. Approaching high coolant temperature
8. Approaching low oil pressure
9. Low coolant temperature
10. Low voltage in battery
11. Control switch not in auto. position
12. Low fuel main tank
13. Battery charger ac failure
14. High battery voltage
15. EPS supplying load
16. Spare

2.15 REMOTE ANNUNCIATOR NFPA 110

- A. Provide a remote annunciator to meet the requirements of NFPA 110, Level 1. The annunciator shall provide remote annunciation of all points stated above and shall incorporate ring-back capability so that after silencing the initial alarm, any subsequent alarms will sound the horn. Provide alarm indication for "generator ground fault" on solidly grounded wye systems of more than 150 volts to ground and circuit breakers rated 1000 amp or more, to meet NEC. Locate the annunciator per the fire marshall.

2.16 PROGRAMMABLE CONTROL PANEL

- A. Provide programmable protective relay functions inside the control panel to include the following:
1. Undervoltage
 2. Overvoltage

3. Overfrequency
4. Underfrequency
5. Reverse power
6. Overcurrent (phase and total)
7. KW level (overload)
8. Three spare LED's
9. Four spare inputs

2.17 INLET AIR SYSTEM

- A. The engine air cleaner shall be engine mounted with dry element requiring replacement no more frequently than 250 operating hours or once each year

2.18 SILENCER

- A. A critical grade exhaust silencer, companion flanges, and flexible stainless steel exhaust fitting properly sized shall be furnished and installed according to the manufacturer's recommendation. The silencer shall be mounted so that its weight is not supported by the engine nor will exhaust system growth due to thermal expansion be imposed on the engine. Exhaust pipe size shall be sufficient to ensure that exhaust backpressure does not exceed the maximum limitations specified by the engine manufacturer. Silencer to mount inside enclosure.

2.19 ELECTRICAL STARTING SYSTEM

- A. The engine starting system shall include dual 24 volt DC starting motors, starter relay, and automatic reset circuit breaker to protect against butt engagement. Batteries shall be maintenance free, lead acid types mounted near the starting motor. A corrosion resistant or coated steel battery rack shall be located to avoid spillage from servicing of fuel and oil filters. Required cables will be furnished and sized to satisfy circuit requirements. The system shall be capable of starting a properly equipped engine within 10 seconds at ambient temperatures greater than 22C (70F)

2.20 JACKET WATER HEATER

- A. A unit mounted thermal circulation type water heater. The heater Watt rating shall be sized by the manufacturer to maintain jacket water temperature at 90 degrees F. Heaters shall accept 120 volt AC single phase power and include thermostatic controls. Hoses to and from the heater shall be industrial quality, which exhibit long life in operational environments. Manual shutoff valves shall be incorporated to isolate the heater during servicing.

2.21 BATTERIES

- A. Batteries for starting and control shall be selected and supplied by the generator set manufacturer. They shall be a heavy duty SLI lead acid type with thru-partition connectors, and housed in a hard rubber or polypropylene case with provision for venting.
- B. Starting batteries shall be rated 24 volt DC with a minimum of 190 ampere-hour and 1300 CCA. Sizing shall consider specific application requirements of engine oil viscosity, ambient starting

temperature, control voltage, overcharging and vibration.

- C. Batteries shall be located as close to the starting motor as practical, away from spark sources, in a relatively cool ambient, and permit easy inspection and maintenance. Battery warranty shall be the responsibility of the generator set manufacturer.

2.22 BATTERY TRAYS

- A. A battery tray shall be provided for the batteries and shall conform to NEC 480-7(b). It shall be treated to be resistant to deterioration by battery electrolyte. Further, construction shall be such that any spillage or boil-over battery electrolyte shall be contained within the tray to prevent a direct path to ground.

2.23 BATTERY CHARGER

- A. A current limiting battery charger shall be furnished to automatically recharge batteries. Charger shall float at 2.17 volts per cell and equalize at 2.33 volts per cell. It shall include overload protection, silicon diode full wave rectifiers, voltage surge suppressor, DC ammeter, DC voltmeter, and fused AC input. AC input voltage shall be 120/240 volts, single phase. Charger shall have LED annunciation for low DC volts, rectifier failure, loss of AC power, high DC volts. Amperage output shall be no less than twenty (20) amperes. Charger shall be wall-mounting type in NEMA 1 enclosure.

2.24 WEATHER-PROTECTIVE ENCLOSURE

- A. 14 gauge galvanized steel drop over weatherproof enclosure with steel tubing frame, galvanized angle iron base, motor operated (spring open) intake louvers, gravity radiator discharge louvers, hinged access doors, stainless steel t-handle latches and stainless steel hinge.
- B. Internal critical grade insulated silencer

2.25 ISOLATORS – SPRING TYPE

- A. Steel spring isolators shall be installed between the generator set base and the mounting surface. The isolators shall bolt to the base, and have a waffled or ribbed pad on their bottom surface. The pads shall be resistant to heat and age, and impervious to oil, water, antifreeze, and cleaning compounds.

PART 3 - EXECUTION

3.1 GENERAL

- A. The following articles and paragraphs are intended to define acceptable procedures and practices of inspecting, installing, and testing the generator set and associated equipment.

3.2 PREDELIVERY INSPECTION

- A. A predelivery inspection must be performed by the system manufacturers' local dealer at the dealer's facility to insure no damage occurred in transit and all genset components, controls, and switchgear are included as specified herein.

3.3 SHIPMENT TO JOB SITE

- A. Delivery shall be FOB to the job site by the system manufacturer's authorized dealer.

3.4 INSTALLATION

- A. The installation shall be performed in accordance with shop drawings, specifications, and the manufacturer's instructions.

3.5 FIELD QUALITY CONTROL

- A. The complete installation shall be checked for procedural and operational compliance by a representative of the system manufacturer's authorized local dealer. The engine lubricating oil and antifreeze, as recommended by the system manufacturer, shall be provided by the generator set dealer. If different manufacturers furnish switchgear and generator sets, technical representatives of both manufacturers' authorized dealers shall verify the installation meets requirements. Any deficiencies shall be noted and corrected by the Contractor.
- B. The system manufacturer's dealer representative shall be present to assist the Contractor during start-up, systems check, adjusting, and any site testing required after the installation is complete.

3.6 POST INSTALLATION TESTING

- A. Following installation, the following tests shall be performed by the system manufacturer's local dealer representative(s) in the presence of the owner's engineer or designated appointee:

3.7 PRESTART CHECKS:

1. oil level
2. water level
3. day tank fuel level
4. battery connection and charge condition
5. air start supply pressure (if so equipped)
6. engine to control interconnects
7. engine generator intake/exhaust obstructions
8. engine room ventilation obstructions
9. removal of all packing materials

3.8 OPERATION:

- A. Functional load testing shall be provided, using the existing building load with run times in accordance with the recommendations of the generator set manufacturer. During the test procedure period at full building load, the following shall be recorded and provided in the test report:
 1. Voltage and amperage (3 phase), frequency
 2. Fuel pressure, oil pressure and water temperature

3. Exhaust gas temperature at engine exhaust outlet
 4. Ambient temperature
- B. If equipped with appropriate instrumentation:
1. Kilowatts
 2. Power Factor
 3. KVARs
- C. Proper operation of controls, engine shutdown, and safety devices shall be demonstrated.
- D. Should these tests indicate that the equipment does not meet the specified performance requirements, NEC (National Electric Code) and Local codes, the cost of all corrective measures shall be borne by the manufacturer's representative.

3.9 ORIENTATION

- A. The system manufacturer's authorized dealer shall provide a complete orientation for the owner's engineering and maintenance personnel. Orientation shall include both classroom and hands-on instruction. Topics covered shall include control operation, schematics, wiring diagrams, meters, indicators, warning lights, shutdown system and routine maintenance.

3.10 SERVICE MANUALS AND PARTS BOOKS

- A. The system manufacturer's authorized local dealer shall furnish one copy each of the manuals and books listed below for each unit under this contract:
- B. OPERATING INSTRUCTIONS - with description and illustration of all switchgear controls and indicators and engine and generator controls.
- C. PARTS BOOKS - which illustrate and list all assemblies, subassemblies and components, except standard fastening hardware (nuts, bolts, washers, etc.).
- D. PREVENTATIVE MAINTENANCE INSTRUCTIONS - on the complete system that cover daily, weekly, monthly, biannual, and annual maintenance requirements and include a complete lubrication chart.
- E. ROUTINE TEST PROCEDURES - for all electronic and electrical circuits and for the main AC generator.
- F. TROUBLESHOOTING CHART - covering the complete generator set showing description of trouble, probable cause, and suggested remedy.
- G. RECOMMENDED SPARE PARTS LIST - showing all consumables anticipated to be required during routine maintenance and test.
- H. WIRING DIAGRAMS AND SCHEMATICS - showing function of all electrical components.
- I. All manuals and books described above shall be contained in rigid plastic pouches.

3.11 CONTRACT MAINTENANCE

- A. The system manufacturer's authorized dealer shall furnish the owner's engineer with a copy of any contract maintenance agreement negotiated relative to the equipment specified in this section. The contract information shall detail agreed upon maintenance intervals, work to be performed at each interval, reimbursement schedule for maintenance work, and owner's responsibilities versus dealer's responsibilities.

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END OF SECTION

**SECTION 26 24 16
PANELBOARDS**

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes lighting and power panelboards and associated auxiliary equipment rated 600v or less.

1.2 SUBMITTALS

- A. Product data for each type panelboard, accessory item, and component specified.
- B. Shop drawings from manufacturers of panelboards including dimensioned plans, sections, and elevations. Show tabulations of installed devices, major features, and voltage rating. Include the following:
1. Enclosure type with details for types other than Nema type 1.
 2. Bus configuration and current ratings
 3. Short-circuit current rating of panelboard
 4. Features, characteristics, ratings, and factory settings of individual protective devices and auxiliary components.
- C. Panel schedules for installation in panelboards. Submit final versions after load balancing.
- D. Maintenance data for panelboard components, for inclusion in operating and maintenance manual specified in Division 1 and in Division 26 section "Basic Electrical Requirements". Include instructions for testing circuit breakers.
- E. Submit complete parts list.

1.3 QUALITY ASSURANCE

- A. Listing and labeling: Provide products specified in this section that are listed and labeled.
- The terms "Listed" and "Labeled" shall be defined as they are in the National Electrical Code, article 100.
- B. Electrical component standard: Components and installation shall comply with NFPA 70, National Electrical Code, latest edition.
- C. Nema standard: Comply with Nema PB1, "Panelboards".
- D. UL standards: Comply with UL 61, "Panelboards", and UL 50, "Cabinets and Boxes".

1.4 EXTRA MATERIALS

- A. Keys: Furnish three spares of each type for panelboard cabinet locks.
- B. Touch-up paint for surface-mounted panelboards: One half-pint container.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - 1. Square D Co.
 - 2. ABB
 - 3. Cutler Hammer

2.2 PANELBOARDS, GENERAL REQUIREMENTS

- A. Overcurrent protective devices (OCPDS): Provide type, rating, and features as indicated. Tandem circuit breakers shall not be used. Multiple breakers shall have common trip. Bolt-on type breakers.
- B. Enclosures: Cabinets, flush or surface mounted as indicated. Nema type 1 enclosure, except where other enclosure requirements are indicated.
- C. Front: Secured to box with concealed trim clamps except as indicated. Front for surface-mounted panels shall be same dimensions as box. Fronts for flush panels shall overlap box except as otherwise specified.
- D. A directory card with clear plastic cover shall be mounted on the inside of each door.
- E. Bus: Copper
- F. Main and neutral lugs: Mechanical type
- G. Equipment ground Bus: Adequate for feeder and branch-circuit equipment ground conductors. Bonded to box.
- H. Service equipment approval: Listed for use as service equipment for panelboards having main service disconnect.
- I. Provision for future devices: Equip with mounting brackets, bus connections, and necessary appurtenances, for the OCPD ampere ratings indicated by "space" for future installation of devices.
- J. Interrupting rating:
 - 1. "Series rating" of distribution equipment is not permitted. All equipment shall be fully rated.
- K. The panel covers shall be hinged panel with door to allow access to the wiring terminations.

2.3 LIGHTING AND APPLIANCE BRANCH CIRCUIT PANELBOARDS

- A. Branch OCPDS: Bolt-on circuit breakers, replaceable without disturbing adjacent units.
- B. Doors: Door in door construction. Secure with flush catch and tumbler lock, all keyed alike.

2.4 DISTRIBUTION PANELBOARDS

- A. Doors: In panel front, omit single panelboard door in cabinet front for fusible switch panelboards except as indicated. Secure with vault-type with tumbler lock, all keyed alike.
- B. Branch-circuit breakers: Where OCPDS are indicated to be circuit breakers, use bolt-on breakers except circuit breakers 225 ampere frame size and greater may be plug-in type where individual positive locking device requires mechanical release for removal.

2.5 IDENTIFICATION

- A. General: Refer to Division 26 section "Electrical Identification" for labeling materials.
- B. Panelboard nameplates: Engraved laminated plastic or metal nameplate for each panelboard mounted with epoxy or industrial cement or industrial adhesive.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install panelboards and accessory items in accordance with Nema PB 1.1, "General Instructions for Proper Installation, Operation and Maintenance of Panelboards Rated 600 Volts or Less" and manufacturers' written installation instructions.
- B. Ground fault protection: Install panelboard ground fault circuit interrupter devices in accordance with installation guidelines of Nema 289, "Application Guide for Ground Fault Circuit Interrupters".
- C. Mounting heights: Top of trim 6'-2" above finished floor, except as indicated.
- D. Mounting: Plumb and rigid without distortion of box. Mount flush panels uniformly flush with wall finish.
- E. Circuit directory: Typed and reflective of final circuit changes required to balance panel loads. Obtain approval before installing.
- F. Install filler plates in unused spaces.
- G. Provision for future circuits at flush panelboards: Stub ten 3/4 inch empty conduits from panel into accessible ceiling space or space designated to be ceiling space in future.
- H. Auxiliary Gutter: Install where a panel is tapped to a riser at an intermediate location.

- I. Wiring in panel gutters: Train conductors neatly in groups, bundle, and wrap with wire ties after completion of load balancing.
- J. Provide cutting, patching and painting as required.

3.2 GROUNDING

- A. Connections: Make equipment grounding connections for panelboards as indicated.
- B. Provide ground continuity to main electrical ground bus indicated.

3.3 CONNECTIONS

- A. Tighten electrical connectors and terminals, including grounding connections, in accordance with manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.4 FIELD QUALITY CONTROL

- A. Pretesting: Upon completing installation of the system, perform the following preparations for tests:
 - 1. Make insulation resistance tests of panelboard buses, components, and connecting supply, feeder, and control circuits.
 - 2. Make continuity tests of circuits.
 - 3. Provide set of contract documents to test organization. Include full updating on final system configuration and parameters where they supplement or differ from those indicated in original contract documents.
- B. Quality control program: Conform to the following:
 - 1. Procedures: Make field tests and inspections and prepare panelboard for satisfactory operation in accordance with manufacturer's recommendations and these specifications.
 - 2. Schedule tests with at least one week in advance notification.
 - 3. Reports by testing organization: Report written reports of tests and observations. Report defective materials and workmanship and unsatisfactory test results. Include records of repairs and adjustments made.
 - 4. Labeling: Upon satisfactory completion of tests and related effort, apply a label to tested components indicating results of tests and inspections, responsible organization and person, and date.
- C. Visual and mechanical inspection: Include the following inspections and related work:

1. Inspect for defects and physical damage, labeling, and nameplate compliance with requirements of up-to-date drawings and panelboard schedules.
 2. Exercise and perform operational tests of all mechanical components and other operable devices in accordance with manufacturer's instruction manual.
 3. Check panelboard mounting, area clearances, and alignment and fit of components.
 4. Check tightness of bolted electrical connections with calibrated torque wrench. Refer to manufacturer's instructions for proper torque values.
 5. Perform visual and mechanical inspection and related work for overcurrent protective devices as specified in Division 26.
- D. Electrical tests: Include the following items performed in accordance with manufacturer's instruction:
1. Insulation resistance test of buses and portions of control wiring that disconnected from solid-state devices. Insulation resistance less than 100 megohms is not acceptable.
 2. Ground resistance test on system and equipment ground connections.
 3. Test main and subfeed overcurrent protective devices per manufacturers recommendation.
- E. Retest: Correct deficiencies identified by tests and observations and provide retesting of panelboards by testing organization. Verify by the system tests that the total assembly meets specified requirements.

3.5 CLEANING

- A. Upon completion of installation, inspect interior and exterior of panelboards. Remove paint splatters and other spots, dirt, and debris. Touch up scratches and mars of finish to match original finish.

3.6 COMMISSIONING

- A. Balancing loads: After substantial completion, but not more than two months after final acceptance, conduct load-balancing measurements and circuit changes as follows:
1. Perform measurements during period of normal working load as advised by the owner.
 2. Perform load-balancing circuit changes outside the normal occupancy/working schedule of the facility. Make special arrangements with owner to avoid disrupting critical 24-hour services such as fax machines and on-line data processing, computing, transmitting, and receiving equipment.
 3. Recheck loads after circuit changes during normal load period. Record all load readings before and after changes and submit test records.

4. Tolerance: Difference between phase loads exceeding 20 percent at any one panelboard is not acceptable. Rebalance and recheck as required to meet this minimum requirement.

END OF SECTION

**SECTION 26 24 20
CIRCUIT AND MOTOR DISCONNECTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes circuit and motor disconnect devices.

1.2 QUALITY ASSURANCE

- A. Provide components complying with NFPA 70 "National Electrical Code", latest edition and which are listed and labeled by UL. Comply with UL standard 98 and NEMA standard KS 1.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with requirements, provide products by one of the following:
 - 1. Square D
 - 2. ABB
 - 3. Cutler Hammer

2.2 CIRCUIT AND MOTOR DISCONNECT SWITCHES

- A. Provide circuit and motor disconnect switches in types, sizes, duties, features, ratings, and enclosures as indicated. Provide NEMA 1 enclosure except for outdoor switches, and other indicated locations provide NEMA 4X enclosures with horsepower ratings suitable to the loads. Provide NEMA 4X enclosures in all refrigerated areas.
- B. Fusible switches shall be heavy duty switches of classes and current ratings as indicated. See section "Fuses" for specifications. Where current limiting fuses are indicated, provide switches with non-interchangeable feature suitable only for current ratings as indicated.
- C. Non-fusible disconnects shall be heavy duty switches of classes and current ratings as indicated.
- D. Bolted pressure switches conforming to and listed under UL standard 977; single or double-throw arrangement as indicated. For fusible units provide fuses as indicated.
- E. Service switches shall be heavy duty fusible switches. UL listed for use as service equipment under UL standard 98 or 869.
- F. Accessories:
 - 1. Provide number and arrangement of interlock contacts in switches as indicated.

2. Provide built-in fuse pullers arranged to facilitate fuse removal.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Provide circuit and motor disconnect switches as indicated and where required by the National Electrical Code, latest edition. Comply with switch manufacturer's printed installation instructions.

3.2 FIELD QUALITY CONTROL

- A. Subsequent to completion of installation of electrical disconnect switches, energize circuits and demonstrate capability and compliance with requirements. Except as otherwise indicated, do not test switches by operating them under load. However, demonstrate switch operation through six opening/closing cycles with circuit unloaded. Open each switch enclosure for inspection of interior, mechanical and electrical connections, for installation, and for verification of type and rating of fuses installed. Correct deficiencies then retest to demonstrate compliance. Remove and replace defective units with new units and retest.

END OF SECTION

SECTION 26 27 16
CABINETS, BOXES AND FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This section includes cabinets, boxes, and fittings for electrical installations and certain types of electrical fittings not covered in other sections. Types of products specified in this section include:
1. Outlet and device boxes
 2. Pull and junction boxes
 3. Cabinets
 4. Hinged door enclosures

1.2 DEFINITIONS

- A. **Cabinets:** An enclosure designed either for surface or for flush mounting and having a frame, or trim in which a door or doors may be mounted.
- B. **Device box:** An outlet box designed to house a receptacle device or a wiring box designed to house a switch.
- C. **Enclosure:** A box, case, cabinet, or housing for electrical wiring or components.
- D. **Hinged door enclosure:** An enclosure designed for surface mounting and having swinging doors or covers secured directly to and telescoping with the walls of the box.
- E. **Outlet box:** A wiring enclosure where current is taken from a wiring system to supply utilization equipment.
- F. **Wiring Box:** An enclosure designed to provide access to wiring systems or for the mounting of indicating devices or of switches for controlling electrical circuits.

1.3 QUALITY ASSURANCE

- A. Items provided under this section shall be listed and labeled by UL.
- B. Components and installation shall comply with NFPA 70 "National Electrical Code", latest edition.
- C. Comply with NEMA Standard 250, "Enclosures for Electrical Equipment (1000 volts maximum)".

PART 2 - PRODUCTS

2.1 GENERAL

- A. Electrical cabinets, boxes, and fittings of indicated types, sizes, and NEMA enclosure classes. Where not indicated, provide units of types, sizes, and classes appropriate for the use and location. Provide all items complete with covers and accessories required for the intended use. Provide gaskets for units in damp or wet locations.
- B. All device boxes shall malleable iron.
- C. All fasteners shall be stainless steel hardware.
- D. Fittings for boxes, cabinets, and enclosures to conform to UL 514B. Malleable iron or zinc plated steel for conduit hubs, bushings and box connectors.
- E. Comply with UL 50, "Electrical Cabinets and Boxes", for boxes over 100 cubic inches volume. All junction boxes that are not 'device' boxes shall be stainless steel as follows:
 - 1. Stainless-steel boxes to be fabricated of stainless steel conforming to type 302 of ASTM A 167, "Specification for stainless and heat resisting chromium-nickel steel plate, sheet, and strip". Where necessary to provide a rigid assembly, construct with internal structural stainless steel bracing. Cover shall be gasketed. Provide hinged front door and latch.
- F. Manufactures shall be Hoffman, Appleton, Crouse Hinds

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install items where indicated and where required to suit code requirements and installation conditions.
 - 1. Cap unused knockout holes where blanks have been removed and plug unused conduit hubs.
 - 2. Support and fasten items securely in accordance with Division 26 section "Supporting Devices".
 - 3. Sizes shall be adequate to meet NEC volume requirements, but in no case smaller than sizes indicated.
 - 4. Remove sharp edges where they may come in contact with wiring or personnel.
- B. Install outlet and device boxes and associated covers and fittings of material and NEMA types suitable for each location.
- C. Box mounting heights for the following outlets or devices shall be measured from the finished floor to the center line and shall be in compliance with ADAAG.
 - 1. General purpose, special purpose and telephone outlets - 1'6".

2. Light switches; all areas 46"
 3. Thermostats; all areas 46
 4. Outlets or devices which require special mounting heights shall be noted on the drawings.
 5. Fire alarm pullstations, audio/visual units and smoke detectors shall comply with ADAAG and NFPA 72.
- D. Provide pull and junction boxes for power, signal, and other systems at least 50 percent larger than would be required by Article 370 of NEC, or as indicated. Locate boxes strategically and provide shapes to permit easy pulling of future wires or cables of types normal for such systems.
1. Electrically ground metallic cabinets, boxes, and enclosures. Where wiring to item includes a grounding conductor, provide a grounding terminal in the interior of the cabinet, box or enclosure.
 2. Upon completion of installation, inspect components. Remove burrs, dirt, and construction debris and repair damaged finish including chips, scratches, abrasions and weld marks.
 3. Repair damage using matching corrosion inhibiting touch-up coating.

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END OF SECTION

**SECTION 26 27 26
WIRING DEVICES**

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes the following:

Furnish and install all wiring devices as shown on drawings, bid documents and as specified herein after.

1. Receptacles
2. Ground fault circuit interrupter receptacles
3. Plug connectors
4. Snap switches
5. Incandescent lamp dimmer-switches
6. Fluorescent lamp dimmer-switches
7. Wall plates
8. Floor service outlets
9. Poke-through assemblies

B. The following sections contain requirements that relate to this section.

1. Division 26 section "Circuit and Motor Disconnects" for devices other than snap switches and plug/receptacles sets used as disconnects for motors.
2. Division 26 section "Electrical Identification" for requirements for legends to be engraved on wall plates.
3. Division 26 section "Lighting Control Equipment" for dimmers other than those covered by this section.

C. Comply with provision of the following codes:

1. NFPA 70 "National Electrical Code", latest edition
2. Provide wiring devices which are listed and labeled by UL and comply with applicable UL and NEMA standards.

1.2 SEQUENCE AND SCHEDULING

A. Schedule installation of finish plates after the surface upon which they are installed has received final finish.

PART 2 -PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following:

1. Hubbell

2.2 WIRING DEVICES

- A. Provide wiring devices, in types, characteristics, grades, colors, and electrical ratings for applications indicated which are UL listed and which comply with NEMA WD 1 and other applicable UL and NEMA standards. Verify color selections with owner.

2.3 WALL PLATES

- A. Single and combinations, of types, sizes, and with ganging and cutouts as required. Provide plates which mate and match with wiring devices. Provide metal screws for securing plates to devices with screw heads colored to match finish of plates. Provide wall plate color to match wiring devices except as otherwise indicated. Provide wall plates with engraved legend where indicated. Conform to requirements of section "Electrical Identification". Provide plates possessing the following additional construction features.
 - 1. Material and finish: 302 Stainless Steel plates.
 - 2. Provide labeling for all receptacles. Provide labeling for all existing receptacles within the work areas. Engrave Panel/circuit number on each receptacle plate.

2.4 GROUND FAULT CIRCUIT INTERRUPTERS

- A. Provide ground fault circuit interrupter devices at all locations required by the National Electrical Code, latest edition.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install wiring devices and accessories as indicated, in accordance with manufacturer's written instructions, applicable requirements of NEC and in accordance with recognized industry practices to fulfill project requirements.
- B. Coordinate with other work, including painting, electrical boxes and wiring installations, as necessary to interface installation of wiring devices with other work.
- C. Install wiring devices only in electrical boxes which are clean, free from building materials, dirt, and debris.
- D. Install wiring devices after wiring work is completed.
- E. Install wall plates after painting work is completed.
- F. Tighten connectors and terminals, including screws and bolts, in accordance with equipment manufacturer's published torquing requirements. If not indicated, tighten connectors and terminals to comply with tightening torques specified in UL standard 486A. Use properly scaled torque indicating hand tool. Protect installed components from damage. Replace damaged items prior to final acceptance.

3.2 FIELD QUALITY CONTROL

- A. Prior to energizing circuits, test wiring for electrical continuity, and for short-circuits. Ensure proper polarity of connections is maintained. Subsequent to energizing, test wiring devices and demonstrate compliance with requirements, operating each operable device at least six times.
- B. Test ground fault interrupter operation with both local and remote fault simultaneous in accordance with manufacturer's recommendations.

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END OF SECTION

**SECTION 26 41 13
LIGHTNING PROTECTION**

PART 1 - GENERAL

SCOPE

The work under this section includes all labor, material, equipment and related services necessary to install a new building lightning protection system.

RELATED WORK

Applicable provisions of Division 1 govern work under this section.

Section 07 63 00 – Sheet Metal Roofing Specialties

Section 26 05 26 – Grounding and Bonding for Electrical Systems

REFERENCE STANDARDS

NFPA 780 - Standard for the Installation of Lightning Protection Systems

UL 96A - Standard for Installation Requirements for Lightning Protection Systems

UL 96 – Standard for Lightning Protection Components

DESIGN AND INSTALLATION CRITERIA

Lightning protection system shall be designed, furnished and installed in compliance with the specifications and standards of the most current editions of NFPA 780 and UL 96A, and shall meet the materials, design and installation requirements of the Underwriters Laboratories, Inc. Master Label Program for lightning protection systems. Note: The UL Master Label Certification process is NOT required for this project.

If any departures from the contract documents are deemed necessary by the Contractor, details of such departures and the reasons therefore shall be submitted as soon as practicable to the Architect/Engineer for approval. No such departures shall be made without the prior written approval of the contracting officer and the DFD Representative.

After installation, submit a written report certifying that the lightning protection system is up to the indicated current standards.

QUALIFICATIONS OF EQUIPMENT MANUFACTURER AND DESIGNING/INSTALLING FIRM

Manufacturer: Equipment manufacturer shall be listed with Underwriters Laboratories, Inc. as a lightning protection equipment manufacturer. Minimum 10 years experience.

Designer/Installer: Lightning protection system shall be designed and installed by a contractor that is listed with Underwriters Laboratories for lightning protection. Minimum 10 years experience.

SUBMITTALS

Shop Drawings:

Shop drawings shall be submitted for all materials provided under this Section.

Submit installation drawings showing the type, size and location of all equipment, ground connections and cable routings, etc.

Samples shall be submitted to Architect/Engineer for approval upon request.

GUARANTEE

Guarantee for one year after acceptance by the DFD Representative all equipment, materials and workmanship to be free from defect.

Provide replacement parts for components found defective at no extra cost to the Owner.

PART 2 - PRODUCTS

FABRICATION AND MATERIALS

All components used in the lightning protection system shall be listed and labeled for compliance with UL 96 – Standard for Lightning Protection Components.

Air Terminals:

Air terminals shall be 1/2" x 18" solid copper, blunt tip, and shall project at least 10" above the object to be protected. All air terminal bases shall be cast copper/bronze with stainless steel bolt-pressure cable connectors.

Main and Down Conductors:

Main and down conductors shall be UL listed, Class I or Class II Copper. Main conductors shall have cross-sectional area of 65,000 circular mils minimum. Each main conductor shall be connected to at least 2 down conductors. The average distance between down conductors shall not exceed 100 feet. Conductors that are identified to be concealed shall be installed in Schedule 40, 1" PVC conduit.

Cable Holders, Clamps and Fasteners:

Cable holders, clamps and fasteners shall be an approved type of non-corrosive metal, have ample strength to support conductors and shall be spaced not to exceed 3'-0" centers. Masonry type cable fasteners spaced not to exceed 3'-0" on masonry. Adhesive type cable fasteners spaced not to exceed 3'-0" on flat surfaces.

Cable Connectors:

All cable connectors shall be cast copper/bronze with bolt-pressure type stainless steel bolts and nuts. Cast or stamped crimp fittings are not acceptable.

Ground Terminals:

Ground rods shall be 3/4" in diameter and 10'-0" long and shall be driven to minimum depth of 10' or more if necessary to reach permanent moisture.

Locate ground rods at the perimeter of the structure, at intervals not exceeding 100'-0".

If rock or other conditions make it impossible to comply with the above, provide a copper plate meeting the Underwriters Laboratories, Inc. requirements.

PART 3 - EXECUTION

INSTALLATION

Install system in accordance with UL 96 and 96A, and NFPA 780 requirements.

Installation shall include any third-party inspection that is required by the UL and NFPA requirements.

Interconnection of Metals:

Bond all metal bodies within 6' of the conductors to the system with approved fittings and conductor. Connections between dissimilar metals shall be made with approved bimetallic connections.

Bond all metallic objects and systems at roof levels and elsewhere on the structure. Primary bonds for metal bodies of conductance shall be bonded with appropriate fittings and full-size secondary conductor; and shall consist of but not be limited to the following: exhaust fans, ductwork, exhaust vents and any other piping systems, handrails and/or screens, ladders, metal plumbing stacks, etc. Exterior architectural metal fascia and/or curtain walls or mullions, which extend the full height of the structure, shall also be bonded, if not inherently bonded thru the building frame.

Secondary conductors must pass continuously horizontally or down from point of bond to point of connection to main conductor.

SYSTEM TEST

Provide a Ground Loop Conductor (GLC) continuity test, wire to wire to test resistance. Submit written results of the test. Statement shall be provided on Installer's letterhead paper.

Perform an Ohm test at each down conductor. Submit written results of the test. Statement shall be provided on Installer's letterhead paper.

END OF SECTION

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**SECTION 26 50 00
LIGHTING**

PART 1 - GENERAL

1.1 SUMMARY

- A. Extent, location, and details of interior lighting fixture work are indicated on drawings and in schedules.
- B. Types of interior and exterior lighting fixtures in this section include the following:
 - 1. LED

1.2 SUBMITTALS

- A. Submit manufacturer's product data and installation instructions on each type interior and exterior building lighting fixture and component.
- B. Layout and submit fixture shop drawings in booklet form with separate sheet for each fixture, assembled in "Luminaire Type" alphabetical or numerical order, with proposed fixture and accessories clearly indicated on each sheet. Show lamp type and manufacturer for each lamp.

1.3 QUALITY ASSURANCE

- A. Comply with applicable local code requirements of the authority having jurisdiction and NEC articles 220, 410, and 510 as applicable to installation, and construction of interior and exterior building lighting fixtures.
- B. Comply with applicable requirements of NEMA stds. Pub/no's LE 1 and LE 2 pertaining to lighting equipment.
- C. Comply with UL standards, including UI 486A and B. Pertaining to interior lighting and fixtures. Provide interior and exterior lighting fixtures and components which are UL-listed and labeled.
- D. Provide fluorescent lamp ballasts which comply with certified ballast manufacturers association standards and carry the CBM label. All ballast shall be high power factor, or electronic as noted on the drawings.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Delivery interior and exterior lighting fixtures in factory-fabricated containers or wrappings, which properly protect fixtures from damage.
- B. Store interior and exterior lighting fixtures in original packaging. Store inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, humidity, laid flat and blocked off ground.
- C. Handle interior and exterior lighting fixtures carefully to prevent damage, breaking, and scoring of finishes. Do not install damaged units or components; replace with new.

1.5 SEQUENCING AND SCHEDULING

- A. Coordinate with other work including wire/cables, electrical boxes and fittings, and raceways, to properly interface installation of interior and exterior lighting fixtures with other work.
- B. Sequence interior and exterior lighting installation with other work to minimize possibility of damage and soiling during remainder of construction.

PART 2 - PRODUCTS

2.1 FIXTURES

- A. Provide lighting fixtures, of sizes, types and ratings indicated complete with, but not limited to, housings, light engines, reflectors, drivers, and wiring. Ship fixtures factory assembled, with those components required for a complete installation.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install interior and exterior lighting fixtures at locations and heights as indicated, in accordance with fixture manufacturer's written instructions, applicable requirements of NEC, NEMA's "Standard of Installation", Nema standards, and with recognized industry practices to ensure that lighting fixtures fulfill requirements.
- B. Provide fixtures and/or fixture outlet boxes with hangers to properly support fixture weight. Submit design of hangers, method of fastening, other than indicated or specified herein, for review by engineer.
- C. Install flush mounted fixtures properly to eliminate light leakage between fixture frame and finished surface.
- D. Provide plaster frames for recessed fixtures installed in other than suspended grid type acoustical ceiling systems. Brace frames temporarily to prevent distortion during handling.
- E. Furnish and install a hanger wire at each corner of each fixture to support the fixture independently of the ceiling grid. The ceiling grid shall be re-supported if required. Provide fixture clips.
- F. Provide chain mounting and or pendant mounting as directed
- G. Provide stainless steel unistrut as necessary to provide support for lighting fixtures

3.2 ADJUSTING AND CLEANING

- A. Clean interior lighting fixtures of dirt and construction debris upon completion of installation. Clean fingerprints and smudges from lenses.

- B. Protect installed fixtures from damage during remainder of construction period.

3.3 GROUNDING

- A. Provide equipment grounding connections for interior lighting fixtures as indicated. Tighten connections to comply with tightening torques specified in UL std 486A to assure permanent and effective grounds.

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End of Section

**SECTION 26 61 00
MECHANICAL EQUIPMENT**

PART 1 - GENERAL

1.1 SUMMARY

- A. This includes all mechanical equipment provided under Division 26 or other divisions.

1.2 GENERAL

- A. Contractor shall furnish and install all motor starters, fused safety switches, fuses, non-fusible disconnects as required and/or shown on drawings for all mechanical equipment in Division 23 of mechanical specifications.
- B. The contractor shall thoroughly review the drawings and specifications of all other divisions which require electrical connections and/or are shown on electrical drawings. The Contractor is responsible for all electrical work shown and /or indicated in other sections and/or divisions. Coordinate all electrical work with these other divisions.
- C. The contractor shall furnish and install all cords, receptacles, plugs, junction boxes, flexible wiring as required to connect equipment.
- D. The contractor shall obtain shop drawings for proper rough-in of all mechanical equipment prior to rough-in.

PART 2 – PRODUCTS

2.1 PRODUCTS, GENERAL

- A. Refer to Section 26 05 00 – Common Work Results for Electrical

PART 3 - EXECUTION

3.1 Execution, GENERAL

- A. Refer to Section 26 05 00 – Common Work Results for Electrical

This Page is intentionally left blank.

END OF SECTION

**SECTION 31 2219
TOPSOIL**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
1. Removal and replacement of topsoil over a prepared subsoil prior to establishment of permanent vegetation.

1.2 DEFINITIONS

- A. Topsoil: Natural, friable, fertile, fine loamy soil possessing characteristics of representative topsoil in the vicinity that produces heavy growth. Topsoil shall have a pH range of 5.5 to 7.4 percent, free from subsoil, objectionable weeds, litter, sods, stiff clay, stones larger than 1/2-inch in diameter, stumps, roots, trash, toxic substances, or any other material which may be harmful to plant growth or hinder planting operations.
- B. Verify amount stockpiled if any, and supply additional as needed from naturally well-drained sites where topsoil occurs at least 4 inches deep. Do not obtain topsoil from bogs or marshes.

1.3 PROJECT CONDITIONS

- A. Work shall be performed only during weather conditions favorable to landscape construction and to health and welfare of plants. Owner shall determine suitability of such weather conditions.
- B. This practice is limited to areas having 3:1 or flatter slopes. For the purpose of these Standards and Specifications, areas having slopes steeper than 3:1 require special consideration and design for adequate stabilization. Areas having slopes steeper than 3:1 shall have the appropriate stabilization shown on the plans.

PART 2 - PRODUCTS

- A. Topsoil. Topsoil: Natural, friable, fertile, fine loamy soil possessing characteristics of representative topsoil in the vicinity that produces heavy growth. Topsoil shall have a pH range of 5.5 to 7.4 percent, free from subsoil, objectionable weeds, litter, sods, stiff clay, stones larger than 1/2-inch in diameter, stumps, roots, trash, toxic substances, or any other material which may be harmful to plant growth or hinder planting operation.
- B. Salvaged Topsoil: Salvaged topsoil consists of the loam, sandy loam, silt loam, silty clay loam or clay loam humus-bearing soils available from overlying portions of areas to be occupied by the completed building and pavement. Salvaged topsoil must meet the following:
1. Topsoil shall be a loam, sandy loam, clay loam, silt loam, sandy clay loam, loamy sand. Other soils may be used if recommended by an agronomist or soil scientist and approved by the Architect. Regardless, topsoil shall not be a mixture of contrasting textured subsoils, and shall contain less than 5 % by volume of cinders, stones, slag, coarse fragments, gravel, sticks, roots, trash, or other materials larger than 1/2 " in diameter.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Determine the depth and suitability of topsoil at the site. (For help, contact your local SWCD office to obtain a county soil survey report).
- B. Prior to stripping topsoil, install appropriate downslope erosion and sedimentation controls such as sediment traps and basins.
- C. Mow topsoil procurement areas to a height of approximately 6 inches. Remove litter such as brush, rock, and other materials that will interfere with subsequent vegetation establishment.
- D. The subsoil shall be tilled to a minimum depth of 6 inches before placement of topsoil.

3.2 PLACING

- A. Verify amount of stockpiled topsoil and supply additional as needed from naturally well-drained sites where topsoil occurs at least 4 inches deep. Do not obtain topsoil from bogs or marshes.
- B. Topsoil shall be tested and amended as per soil test recommendations.
- C. Prior to applying topsoil, the topsoil should be pulverized by mechanical methods.

- D. Where the subsoil is either highly acidic or composed of heavy clays, ground limestone shall be spread at the rate of 4-8 tons/acre (200-400 lbs per 1000 sq ft) prior to the placement of topsoil. distributed uniformly over designated areas and worked into the soil.
- E. Topsoil shall be uniformly distributed in a 4-8 inch layer and lightly compacted to a minimum thickness of 4 inches. Any irregularities in the surface resulting from topsoiling or other operations shall be corrected in order to prevent the formation of depressions or water pockets.
- F. Topsoil, which must be transported across finished sidewalks, shall be delivered in such manner that no damage will be done to sidewalks.
- G. If light sandy soils are covered with heavier clay bearing loam topsoil, then mix or blend the 2 types of soils to a more or less homogeneous mixture by using the appropriate equipment.
- H. Break down all remaining clods and lumps using the appropriate equipment to provide a uniformly textured soil.
- I. Remove rocks, twigs, foreign material, and clods that cannot be broken down. Dress the entire surface to present a uniform appearance.
- J. Topsoil shall not be placed while the topsoil is in a frozen or muddy condition, when the subsoil is excessively wet or in a condition that may otherwise be detrimental to proper grading and seedbed preparation.
- K. After spreading and grading, stabilize with seeding or appropriate vegetation.

END OF SECTION 31 2219

**SECTION 31 2323
FILL**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Filling, backfilling, and compacting for building volume below grade.
- B. Backfilling and compacting for utilities outside the building to utility main connections.

1.2 REFERENCE STANDARDS

- A. AASHTO T 180 - Standard Specification for Moisture-Density Relations of Soils Using a 4.54 kg (10-lb) Rammer and a 457 mm (18 in.) Drop; American Association of State Highway and Transportation Officials; current edition.
- B. ASTM D698 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort (12,400 ft-lbf/ft³ (600 kN-m/m³)); current edition.
- C. ASTM D1557 - Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft³ (2,700 kN m/m³); current edition.

1.3 SUBMITTALS

- A. Materials Sources: Submit name of imported materials source.
- B. Fill Composition Test Reports: Results of laboratory tests on proposed and actual materials used.
- C. Compaction Density Test Reports.

PART 2 PRODUCTS

2.1 FILL MATERIALS

- A. General: Provide approved borrow soil materials from off-site when sufficient approved soil materials are not available from excavations.
- B. Soil Materials: In accordance with ASTM D 2487 in accordance with the chart below:

Rating	Gravels	Sands	Silts	Clays	Organics
Satisfactory	GW (1): clean, well-graded GP: clean, poorly-graded GM (2): unclean, silty	SW: clean, well-graded SP: clean, poorly-graded SM: unclean, silty			
Unsatisfactory	GC: unclean, clayey	SC: unclean, clayey	ML: inorganic MH: inorganic, elastic OL: organic OH: organic	CL: inorganic, lean CH: inorganic, fat OL: organic OH: organic	PT: peat

Note (1) Clean: Less than 5% fines.
Note (2) Unclean: More than 12% fines

- D. Backfill and Fill Materials: Satisfactory soil materials.
- E. Compacted Granular Fill, Subbase, and Base Material: Aggregate base material shall be sound, angular crushed stone, crushed gravel or crushed slag, and sand, stone or slag screenings, meeting ASTM D1241. Gradation shall comply with ODOT 304 or 57.
- F. Engineered Fill: Subbase or base materials.
- G. Bedding Material: Subbase or base materials with 100 percent passing a 1-inch sieve and not more than 8 percent passing a No. 200 sieve.

1. Drainage Fill: Washed, evenly graded mixture of crushed stone, or crushed or uncrushed gravel, ASTM D 448, coarse aggregate grading size 57, with 100 percent passing a 1-1/2-inch sieve and not more than 5 percent passing a No. 8 sieve.
2. Impervious Fill: Clayey gravel and sand mixture capable of compacting to a dense state.
3. Class A Pipe Bedding: Concrete, 3000 psi minimum compressive strength at 28 days. Refer to Section 03300 - Cast-In-Place Concrete.
4. Class B or C Bedding Pipe Bedding: Well-graded crushed stone, crushed gravel or gravel, meeting ASTM C33, gradation 67 (3/4 inch to No. 4).

2.2 SOURCE QUALITY CONTROL

- A. Where fill materials are specified by reference to a specific standard, test and analyze samples for compliance before delivery to site.
- B. If tests indicate materials do not meet specified requirements, change material and retest.
- C. Provide materials of each type from same source throughout the Work.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Identify required lines, levels, contours, and datum locations.

3.2 PREPARATION

- A. Scarify subgrade surface to a depth of 6 inches (150 mm) to identify soft spots.
- B. Cut out soft areas of subgrade not capable of compaction in place. Backfill with general fill.
- C. Compact subgrade to density equal to or greater than requirements for subsequent fill material.
- D. Until ready to fill, maintain excavations and prevent loose soil from falling into excavation.

3.3 FILLING

- A. Fill to contours and elevations indicated using unfrozen materials.
- B. Employ a placement method that does not disturb or damage other work.
- C. Systematically fill to allow maximum time for natural settlement. Do not fill over porous, wet, frozen or spongy subgrade surfaces.
- D. Maintain optimum moisture content of fill materials to attain required compaction density.
- E. Slope grade away from building minimum 2 inches in 10 ft (50 mm in 3 m), unless noted otherwise. Make gradual grade changes. Blend slope into level areas.
- F. Correct areas that are over-excavated.
 1. Other areas: Use general fill, flush to required elevation, compacted to minimum 97 percent of maximum dry density.
- G. Compaction Density Unless Otherwise Specified or Indicated:
- H. Reshape and re-compact fills subjected to vehicular traffic.

3.4 FIELD QUALITY CONTROL

- A. Evaluate results in relation to compaction curve determined by testing uncompacted material in accordance with ASTM D698 ("standard Proctor"), ASTM D1557 ("modified Proctor"), or AASHTO T 180.
- B. If tests indicate work does not meet specified requirements, remove work, replace and retest.

3.5 CLEANING

- A. Remove unused stockpiled materials, leave area in a clean and neat condition. Grade stockpile area to prevent standing surface water.

END OF SECTION 31 2323

**SECTION 32 1313
CONCRETE PAVING**

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete paving and curbs.

1.2 RELATED REQUIREMENTS

- A. Section 07 9200 - Joint Sealants

1.3 REFERENCE STANDARDS

- A. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete; American Concrete Institute International; current edition.
- B. ACI 301 - Specifications for Structural Concrete for Buildings; American Concrete Institute International; current edition.
- C. ACI 305R - Hot Weather Concreting; American Concrete Institute International; current edition.
- D. ACI 306R - Cold Weather Concreting; American Concrete Institute International; current edition.
- E. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; current edition.
- F. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; current edition.

1.4 SUBMITTALS

- A. Design Data: Indicate pavement thickness, designed concrete strength, reinforcement, and typical details.

PART 2 PRODUCTS

2.1 PAVING ASSEMBLIES

- A. Comply with applicable requirements indicated on the C-Series Civil Drawings.

2.2 CONCRETE MIX DESIGN

- A. Proportioning Normal Weight Concrete: Comply with ACI 211.1 recommendations.
- B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI 301.
 - 1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

2.3 MIXING

- A. Transit Mixers: Comply with ASTM C94/C94M.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify compacted subgrade is acceptable and ready to support paving and imposed loads.
- B. Verify gradients and elevations of base are correct.

3.2 SUBBASE

- A. Prepare as specified on the Drawings.

3.3 FORMING

- A. Place and secure forms to correct location, dimension, profile, and gradient.
- B. Assemble formwork to permit easy stripping and dismantling without damaging concrete.
- C. Place joint filler vertical in position, in straight lines. Secure to formwork during concrete placement.

3.4 REINFORCEMENT

3.5 COLD AND HOT WEATHER CONCRETING

- A. Follow recommendations of ACI 305R when concreting during hot weather.

- B. Follow recommendations of ACI 306R when concreting during cold weather.
- C. Do not place concrete when base surface temperature is less than 40 degrees F (4 degrees C), or surface is wet or frozen.

3.6 FINISHING

- A. Area Paving: Light broom, texture perpendicular to pavement direction.
- B. Sidewalk Paving: Light broom, texture perpendicular to direction of travel with troweled and radiused edge 1/4 inch (6 mm) radius.
- C. Curbs and Gutters: Light broom, texture parallel to pavement direction.
- D. Inclined Vehicular Ramps: Broomed perpendicular to slope.
- E. Place curing compound on exposed concrete surfaces immediately after finishing. Apply in accordance with manufacturer's instructions.

3.7 TOLERANCES

- A. Maximum Variation of Surface Flatness: 1/4 inch (6 mm) in 10 ft (3 m).
- B. Maximum Variation From True Position: 1/4 inch (6 mm).

3.8 FIELD QUALITY CONTROL

- A. Compressive Strength Tests: ASTM C39/C39M. For each test, mold and cure three concrete test cylinders. Obtain test samples for every 100 cu yd (76 cu m) or less of each class of concrete placed.
 - 1. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.
 - 2. Perform one slump test for each set of test cylinders taken.

3.9 PROTECTION

- A. Immediately after placement, protect pavement from premature drying, excessive hot or cold temperatures, and mechanical injury.
- B. Do not permit pedestrian traffic over pavement for 7 days minimum after finishing.

END OF SECTION 32 1313

**SECTION 32 9220
SEEDING**

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Fine grading for seeding.
- B. Seeding

1.2 QUALITY ASSURANCE

- A. Seed: All seed specified shall meet the current specifications of ODOT as to the percentage purity, weed seed, and germination. All seed shall be approved by the State of Ohio, Department of Agriculture, Division of Plant Industry and shall meet the requirements of these specifications. Refer to the Drawings for seed mix required.

1.3 SUBMITTALS

- A. Certified seed analysis.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Packaged Materials: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at site.

1.5 JOB CONDITIONS

- A. Utilities: Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.
- B. Excavation: When conditions detrimental to plant growth are encountered, such as rubble fill, adverse drainage conditions, or obstructions, notify Architect before planting.
- C. Spring-sown work shall be installed between April 1st and May 30th and Fall-sown work shall be installed between September 1st and October 15th. No permanent seeding shall take place between May 30th and September 1st. The dates for seeding may be changed at the discretion of the Architect.

PART 2 - PRODUCTS

2.1 SEED

- A. Seed shall be vendor mixed, delivered in original bags and shall be proportioned as noted on the Drawings.
- B. Seed Mixture:
 - 1. Kentucky Blue Grass: 20 percent
 - 2. Creeping Red Fescue Grass: 50 percent
 - 3. Norlea Perennial Rye: 30 percent

2.2 SOIL MATERIALS

- A. Topsoil: See Specification Section 31 2219

2.3 ACCESSORIES

- A. Mulching Material: Oat or wheat straw, free from weeds, foreign matter detrimental to plant life, and dry. Hay or chopped cornstalks are not acceptable.
- B. Fertilizer: Slow Basic Release; recommended for grass, with fifty percent of the elements derived from organic sources; of proportion necessary to eliminate any deficiencies of topsoil, to the following proportions:
 - 1. Nitrogen: 12 percent
 - 2. Phosphoric Acid: 12 percent
 - 3. Soluble Potash: 12 percent
- C. Water: Clean, fresh, and free of substances or matter that could inhibit vigorous growth of grass.
- D. Erosion Fabric: Jute matting, open weave.

PART 3 - EXECUTION

3.1 PREPARATION OF UNCHANGED GRADES

- A. Where seed is to be planted in areas that have not been altered or disturbed by excavating, grading, or stripping operations, prepare soil for planting as follows: Till to a depth of not less than 6 inches. Remove high areas and fill in depressions. Till soil to a homogenous mixture of fine texture, free of lumps, clods, stones, roots and other extraneous matter.
- B. Prior to preparation of unchanged areas, remove existing grass, vegetation and turf. Dispose of such material outside of project limits. Do not turn existing vegetation over into soil being prepared for seed or sod.
- C. If necessary, supply and install topsoil in areas where there is not topsoil left after vegetation has been removed in conformance to Section 2.1.
- D. Fine grade areas to smooth, even surface with loose, uniformly fine texture. Roll, rake, and drag lawn areas, remove ridges and fill depressions, as required to meet finish grades. Remove sticks, roots, rubbish, stones greater than 1/2" in any dimension, and other extraneous matter. Limit fine grading to areas which can be planted immediately after grading.
- E. Moisten prepared areas before planting if soil is dry. Water thoroughly and allow surface moisture to dry before planting lawns. Do not create a muddy soil condition.
- F. Restore areas to specified condition, if eroded or otherwise disturbed, after fine grading and prior to planting.

3.2 SEEDING

- A. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage. Seed shall not be sown when the ground is frozen, muddy, or when weather conditions prevent proper soil preparation, interference with sowing and/or proper incorporation of seed into the soil.
- B. Sow seed using a spreader or hydro seeder. Do not seed when wind velocity exceeds 5 miles per hour. Distribute seed evenly over entire area by sowing 4 lbs. per 1000 sf. at right angles to each other. Total amount to equal 5 lbs. per 1000 sf. unless otherwise altered by the plans or Associate. Immediately after sowing, the seed shall be mulched and watered.
- C. Mulch shall be spread uniformly to form a continuous blanket at a rate of 100 lbs. per 1,000 sf. Mulch shall be 1-1/2" loose measurement over seeded areas.

3.3 REPAIRING PLANTED LAWNS

- A. Recondition all existing lawn areas damaged by Contractor's operations including storage of materials and equipment and movement of vehicles. Also recondition existing lawn areas where minor regrading is required.
- B. Provide new topsoil, as required, to fill low spots and meet new finish grades.
- C. Cultivate bare and compacted areas according to the topsoil specifications.
- D. Remove diseased and unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from the Contractor's operations, including oil drippings, stone, gravel, and other loose building materials.
- E. All work shall be the same as for new seeding.
- F. Water newly planted seeded areas. Maintenance of reconditioned lawns shall be the same as maintenance of new lawns.

3.5 ESTABLISHMENT

- A. Maintain work areas as long as necessary to establish a uniformly close stand of grass over the entire lawn area.
- B. Maintain lawns by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth acceptable lawn.
- C. Mowing
 - 1. Mow lawn areas during the period of maintenance to a height of 2 inches whenever the height of the grass becomes 3 inches. A minimum of 3 mowing's is required during the period of maintenance.
- D. Re-fertilizing

1. Distribute fertilizer on the seeded area between August 15 and October 15, during the period when grass is dry.
- E. Reseeding
 1. Reseed with the seed specified for the original seeding, and at the rate of 4 lbs. per 1,000 sf. in a manner which will cause minimum disturbance to the existing stand of grass and at an angle of not less than 15 degrees from the direction of rows of prior seeding.
- F. Watering
 1. Keep all work areas watered to the extent necessary to achieve satisfactory growth.
- G. Any mulching which has been displaced shall be repaired. Any seed work which has been disturbed or damaged from the displacement of mulch shall be repaired prior to re-mulching.

3.6 INSPECTION AND ACCEPTANCE

- A. When seeding work is complete and an acceptable stand of growth is attained, the Contractor shall request the Architect to make an inspection to determine final acceptance.
- B. All seeded areas shall be guaranteed for one full growing season to commence upon final acceptance of the areas.

END OF SECTION 32 9220

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**SECTION 32 9300
PLANTS**

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plants.

1.2 DEFINITIONS

- A. Backfill: The earth used to replace or the act of replacing earth in an excavation.
- B. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. Pesticides include insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. They also include substances or mixtures intended for use as a plant regulator, defoliant, or desiccant. Some sources classify herbicides separately from pesticides.
- C. Planting Soil: Existing, on-site soil; imported soil; or manufactured soil that has been modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.
- D. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

1.3 PREINSTALLATION MEETINGS

- A. Preinstallation Conference: Conduct conference at Project site.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.5 INFORMATIONAL SUBMITTALS

- A. Product certificates.
- B. Sample warranty.

1.6 CLOSEOUT SUBMITTALS

- A. Maintenance Data: Recommended procedures to be established by Owner for maintenance of plants during a calendar year.

1.7 QUALITY ASSURANCE

- A. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
 - 1. Pesticide Applicator: State licensed, commercial.
- B. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver bare-root stock plants within 24 hours of digging. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting. Transport in covered, temperature-controlled vehicles, and keep plants cool and protected from sun and wind at all times.
- B. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.
- C. Handle planting stock by root ball.
- D. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.
- E. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate

aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1.9 WARRANTY

- A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner.
 - b. Structural failures including plantings falling or blowing over.
 - 2. Warranty Periods: From date of Substantial Completion.
 - a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
 - b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
 - c. Annuals: Three months.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

- A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant List, Plant Schedule, or Plant Legend indicated on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
- B. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which begins at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- C. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

2.2 FERTILIZERS

- A. Planting Tablets: Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots.
 - 1. Nutrient Composition: 20 percent nitrogen, 10 percent phosphorous, and 5 percent potassium, by weight plus micronutrients.

2.3 MULCHES

- A. Organic Mulch: Shredded hardwood: color to be selected by Architect.
- B. Mineral Mulch: Rounded riverbed gravel or smooth-faced stone
 - 1. Size Range: 1-1/2 inches (38 mm) maximum, 3/4 inch (19 mm) minimum
 - 2. Color: Readily available natural gravel color range acceptable to the Architect

2.4 WEED-CONTROL BARRIERS

- A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally encountered chemicals, alkalis, and acids.
- B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

2.5 PESTICIDES

- A. General: Pesticide registered and approved by the EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as

required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

PART 3 - EXECUTION

3.1 PLANTING AREA ESTABLISHMENT

- A. Placing Planting Soil: Blend planting soil in place.
- B. Before planting, obtain Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.2 EXCAVATION FOR TREES AND SHRUBS

- A. Planting Pits and Trenches: Excavate circular planting pits.
 - 1. Excavate planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are unacceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
 - 2. Excavate approximately three times as wide as ball diameter.
 - 3. Excavate at least **12 inches (300 mm)** wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
 - 4. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
- B. Backfill Soil: Subsoil and topsoil removed from excavations may be used as backfill soil unless otherwise indicated.

3.3 TREE, SHRUB, AND VINE PLANTING

- A. Inspection: At time of planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- B. Roots: Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- C. Set each plant plumb and in center of planting pit or trench with root flare **1 inch (25 mm)** above adjacent finish grades.
 - 1. Backfill: Planting soil For trees, use excavated soil for backfill.
 - 2. Balled and Burlapped Stock: After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 3. Balled and Potted and Container-Grown Stock: Carefully remove root ball from container without damaging root ball or plant.
 - 4. Fabric Bag-Grown Stock: Carefully remove root ball from fabric bag without damaging root ball or plant. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - 5. Bare-Root Stock: Support stem of each plant and spread roots without tangling or turning toward surface. Plumb before backfilling, and maintain plumb while working. Carefully work backfill around roots by hand. Bring roots into close contact with the soil.
 - 6. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - 7. Place planting tablets equally distributed around each planting pit when pit is approximately one-half filled. Place tablets beside the root ball about **1 inch (25 mm)** from root tips; do not place tablets in bottom of the hole.
 - a. Bare-Root Stock: Place tablets beside soil-covered roots; do not place tablets touching the roots.
 - b. Quantity: Two per plant or Three for each caliper inch of plant.

8. Continue backfilling process. Water again after placing and tamping final layer of soil.
- D. Slopes: When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.4 TREE, SHRUB, AND VINE PRUNING

- A. Remove only dead, dying, or broken branches. Do not prune for shape.
- B. Prune, thin, and shape trees, shrubs, and vines as directed by Architect.
- C. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; and prune to retain natural character.
- D. Do not apply pruning paint to wounds.

3.5 GROUND COVER AND PLANT PLANTING

- A. Set out and space ground cover and plants other than trees, shrubs, and vines in even rows with triangular spacing.
- B. Use planting soil for backfill.
- C. Dig holes large enough to allow spreading of roots.
- D. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- E. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- F. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.6 PLANTING AREA MULCHING

- A. Install weed-control barriers before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of **6 inches (150 mm)** and secure seams with galvanized pins.
- B. Mulch backfilled surfaces of planting areas and other areas indicated.

3.7 PLANT MAINTENANCE

- A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings.
- B. Fill in, as necessary, soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices when possible to minimize use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.
- D. Apply pesticides and other chemical products and biological control agents according to authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- E. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- F. At time of Substantial Completion, verify that tree-watering devices are in good working order and leave them in place. Replace improperly functioning devices.

END OF SECTION 32 9300