INVITATION TO BID
from
COMMUNITY COLLEGE OF ALLEGHENY COUNTY
PURCHASING DEPARTMENT
800 ALLEGHENY AVENUE, PITTSBURGH, PENNSYLVANIA 15233

BID PROPOSAL NO. 1139
DOORS, HARDWARE, AND ACCESS CONTROL – PHASE 1
HOMEWOOD BRUSHTON CENTER

Sealed proposals will be received and publicly opened by a Purchasing Agent of the Community College of Allegheny County.
Proposals must be received by the Purchasing Department, 800 Allegheny Avenue, Pittsburgh, Pennsylvania 15233 on or before 2:00 PM, on Tuesday, April 29, 2025.

Proposals received after this deadline will be considered as a "late bid" and returned unopened to the offerer.

BID SCOPE

Provide all labor, material, equipment, permits and supervision required to furnish and install doors, hardware, and access control at Homewood Brushton Center in accordance with specification, terms and conditions contained herein. There is to be **one Prime Contractor** (this can be GC, Controls, Security, Electric or other) and **everything is the responsibility of that Prime Contractor**; if work is required that is not in the Prime Contractor's area of expertise then it is the responsibility of the Prime Contractor to sub any such work out to a sub-contractor.

A mandatory pre-bid meeting and site visitation will be held on Wednesday, April 16, 2025, at 9:30 a.m. Meet at the front entrance to Homewood Brushton Center, 701 N. Homewood Ave., Pittsburgh, PA 15208

For questions, contact Mike Cvetic, Director of Purchasing, at mcvetic@ccac.edu no later than Wednesday, April 23.

BID REQUIREMENTS (where checked)

__X__ Bid Bond. . . . . 10% of total base bid amount (Submit with Bid)

__X__ Performance Bond. . . . . 100% of total contract amount (Awardee Only)

__X__ Payment Bond. . . . . 100% of total contract amount (Awardee Only)

__X__ Master Services Agreement (Awardee Only)

__X__ No Lien Agreement (Awardee Only)

__X__ Insurance Certificate (Awardee Only)

BID BOND: Bid must include the required bid bond or certified check, which will be returned to the unsuccessful bidder approximately 45 days after the bid due date.

PERFORMANCE BOND: The successful bidder will be required to enter into a written contract with the College and to furnish a contractor's bond conditioned for the faithful and full performance of the contract with sufficient surety in the amount stated above. Any surety cosigning the contractor's bond shall be an Incorporated surety company approved by the Court of Common Pleas of Allegheny County. Bond with surety must be furnished within 20 days after receipt of the contract. The Board of Trustees reserves the right to reject any bond furnished where it is in the best interest of the College to do so.
The College requires Power of Attorney attached to bonds to be dated concurrently, sealed, and executed by a proper **live** (not facsimile) **signature**.
PAYMENT BOND: The bidder to whom the contract is awarded shall furnish a bond to guarantee the payment of third-party subcontractors involved in fullment of services rendered against College contracts. Such bonds shall be with sufficient surety and in the amount stated above. Failure on the part of the contractor to furnish such bond shall be just cause for cancellation of award.
NO LIEN AGREEMENT AND/OR INSURANCE CERTIFICATES: As required by the College, the No Lien Agreement and/or Insurance Certificate may be requested of the successful bidder.

THE BOARD OF TRUSTEES RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS.

BID PROPOSAL NO. 1139
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HOMEWOOD BRUSHTON CENTER

The Community College of Allegheny County is commencing the first phase of a multi-phase **Access Control and Secure Lockdown Project** across the entire College – 4 campuses and 3 centers. This Phase 1 – Homewood Brushton Center, a single building center - is the initial implementation of this critical CCAC infrastructure project to assure access control and secure lockdown across the entire College. Additional phases (campuses, centers and buildings) will be bid at later dates.

This project scope is for the Access Control and Secure Lockdown Project at Homewood Brushton Center in its entirety, as noted on all the drawings and specifications provided in the bid documents. **There to be one Prime Contractor** (this can be GC, Controls, Security, Electric or other) and **everything in this project scope is the responsibility of that Prime Contractor;** if work is required that is not in the Prime Contractor's area of expertise then it is the responsibility of the Prime Contractor to sub any such work out to a sub-contractor. All subcontracted work must be included in the Prime Contractor's bid.

The Prime Contractor will be responsible for maintaining a secure project site (the Homewood Brushton Center building and property throughout the duration of the project.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

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FOR
BID PROPOSAL NO. 1139

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The CCAC Purchasing Department is now publishing all bids via the CCAC website at https://ccac.edu/about/procurement.php. It will be each vendor's responsibility to monitor the bid activity within the given website ("Bid and RFP Opportunities") and ensure compliance with all applicable bid documents inclusive of any issued addenda. Failure to incorporate any applicable addenda in the final submittal may result in the rejection of your bid.

NOTE: FAX OR ELECTRONIC RESPONSES TO BID PROPOSALS ARE NOT ACCEPTABLE.

In the event a sealed bid is hand carried, it is the sole responsibility of the bidder to assure the bid is in possession of the CCAC Purchasing Department prior to the time set for opening.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

INSTRUCTIONS TO BIDDERS

1. All prices quoted shall be F.O.B. destination and include all freight and delivery charges to actual point of delivery.

2. **Bids that vary from specifications/addendum(s) may be rejected by the College.** Any and all changes to specifications will be issued by addenda via fax/mail. It is the responsibility of bidders to provide the College with company name, address, telephone, and fax numbers and contact names if applicable.

3. Bidders must be recognized dealers in specified materials and qualified to advise in the application and/or use of the materials. When requested, the bidder must satisfy the Community College of Allegheny County that they have the organization, capital, and stock availability and experience to fulfill their bid offer.

4. Bids may be rejected or award cancelled by the College if a bidder intends to sublet any/all of the required work.

5. Completely executed bid documents must be submitted in a **sealed envelope bearing the offering company's name and address; and, the bid number must appear on the sealed envelope.** No College representative will bear any responsibility for the premature opening of a bid which is not properly addressed and identified.

6. Whenever the words "Purchasing Agent" or a pronoun referring to a College Agent appears in either the specifications and/or Articles of Agreement, the Agent is acting only under the authority of and subject to the approval of the Board of Trustees of the Community College of Allegheny County.

7. The College reserves the right to award all or any items, separately or in a lump sum whichever is in the best interest of the College.

8. Bids for supplies shall be submitted to the College in accordance with the numbered item(s) on the price sheet. Unit prices(s) shall prevail where extension of prices is requested.

9. Contracts will not be awarded by the College to any corporation, firm, or individual that has failed in any former contract with the College to perform work or complete work or, in the College's sole judgment, to satisfactorily deliver or provide the quality of materials, fulfill a guarantee(s) or complete work in accordance with the schedule for such prior contract."

10. If the College Agent is of the opinion that the awarded work/products are unnecessarily delayed, the rate of progress of delivery is unsatisfactory, or that the corporation, firm, or individual contractor is willfully violating any of the contract requirements or conditions or is acting in bad faith, the College's Agent shall take whatever action necessary for the completion of the work and/or delivery of the products to the College. Resulting expenses to the College will be deducted from monies due the contractor and the bondsman will be held liable for any balance due at the completion of the contract.

11. Inspection of materials and workmanship of the contractor by a College Agent will not lessen the responsibility of the contractor from the obligation to perform and deliver satisfactory work/materials to the College. The contractor is expected to pay for the cost of tests for defective materials. This cost may be deducted from any monies due the contractor from the College.

12. The contractor will not receive instructions from a College Agent relative to the work or delivery until a contract has been duly signed and the bond, if required, is approved.

13. Companies may quote price(s) on work/material to any and all bidders and may also directly submit a bid to the College for the work/material.

14. When samples are requested by the College, the bidder must supply them free of charge. Samples will not be returned to the bidder.

15. The bidder is solely at risk when using unauthorized patented material.

16. Quantities requested by the College are for bidding purposes only. The College may purchase more or less than the estimated quantities.

17. The College reserves the right to reject any and all bids, and to waive minor discrepancies in the bids or specifications, when in the best interest of the College. The College may purchase any part, all, or none of the materials specified.

18. The College will reject materials that do not meet specifications, even if the bidder lists trade names, or names of such materials on the bid.

19. All prices quoted must be held firm for the contract period. Bids containing escalation or other clauses for price change may be rejected. Discounts or other uncalled for allowances quoted will not be considered in making the award and the bid may be rejected.

20. Unless otherwise specified, materials, supplies, and/or equipment must be delivered thirty (30) days from the date of the purchase order.

21. Unless otherwise specified, materials, supplies, and/or equipment must be new, current stock, and unused.

SIGNING OF AGREEMENT AND BOND

22. Successful bidders are required to sign Contract Articles of Agreement and bond forms as follows:

    If trading as an Individual: All copies of Contract Articles of Agreement and bond(s) must be signed by the individual to whom the award is made and signature must be witnessed by the same witness.

    If trading as a Partnership: All copies of Contract Articles of Agreement and bond(s) must be signed by **every partner** comprising the Partnership, regardless of number, and these signatures must be witnessed by the same witness.

    If trading as a Corporation: All copies of Contract Articles of Agreement and bond(s) must be signed by the **President (or Vice President)** and attested by the Secretary or Assistant Secretary and Corporate seal must appear on all copies.

    The County requires that Power of Attorney forms be attached to bonds, bear the same date as that appearing on the bonds and that the forms are sealed and executed by a proper **live signature**.

FICTITIOUS NAME REGISTRATION

23. To comply with a provision of the law regarding registration under the Fictitious Name Act of the Commonwealth of Pennsylvania, successful bidders trading as an **Individual or a Partnership** must submit a certified copy of their Fictitious Name Registration with their contract. Fictitious Name Registration forms are issued by the Office of the Prothonotary of Allegheny County, or the county in which the business is located.

PREVENTION OF DELAY

24. A contractor will be considered in **default** if the contractor has work performed or means employed in the carrying out of the contract that would in any way cause or result in a suspension or delay of, or strike upon the work to be performed of any of the trades working in or about the premises described, or in or about any other building of the Community College of Allegheny County.

25. When trade names or catalog numbers are used, bidders may quote on any equal (unless otherwise stated by the College) but such bids must show trade names and/or catalog numbers of the products.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

RETURN BID PROPOSAL FORM
FOR

BID PROPOSAL NO. 1139
DOORS, HARDWARE, AND ACCESS CONTROL – PHASE 1
HOMEWOOD BRUSHTON CENTER

Complete this form and submit with your bid.

- **The undersigned agrees to comply with the Instructions to Bidders and Specifications for the price(s) quoted on the Return Price Form. Price(s) quoted include all allowable cash and/or credit discounts.**
- **The College may reject bids quoting unspecified discounts and/or allowances.**

Submitted by:

_____

Company Name Bidding (Please print) | Contact Person at Company (Please print)

_____ _____

Signature | Title

(Handwritten signature must appear here in ink.)

Address_____

_____ _____

Telephone Number (Include Area Code.) | Fax Number (Include Area Code.)

Trading as: (Check one.) **Please print.**

_____ Individual Owner _____

_____ Partnership Partner _____ Partner_____

_____Corporation Exact Name_____

State Incorporated_____

THE BOARD OF TRUSTEES OF THE COLLEGE RESERVES THE RIGHT TO REJECT ANY OR ALL BIDS.

Rev: 1/01

BID PROPOSAL NO. 1139

DOORS, HARDWARE, AND ACCESS CONTROL – PHASE 1
HOMEWOOD BRUSHTON CENTER

BID SHEET

BASE BID

Provide all labor, material equipment, permits, and supervision required furnish and install doors, hardware, and access control at the **Homewood Brushton Center a**s specified herein.

Lump Sum Bid: $_____

BIDDER'S NAME (please print):_____

RETURN FORM 2.0

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

NON-COLLUSION AFFIDAVIT

Contract/Bid No. **1139**

State of _____ : :s.s.

County of _____ :

I state that I am _____of_____

(title) (name of my firm)

and that I am authorized to make this affidavit on behalf of my firm, and its owners, directors, and officers. I am the person responsible in my firm for the price(s) and the amount of this bid.

I state that:

(1) The price(s) and amount of this bid have been arrived at independently and without consultation, communication or agreement with any bidder or potential bidder.

(2) Neither the price(s) nor the amount of this bid, and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.

(3) No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.

(4) The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.

(5) _____, its affiliates,

(name of my firm)

subsidiaries, officers, directors and employees are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by State or Federal law in any jurisdiction, involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

I state that_____ understands and

(name of my firm)

acknowledges that the above representations are material and important, and will be relied on by the Community College of Allegheny County in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from the Community College of Allegheny County of the true facts relating to the submission of bids for this contract.

Signature_____ Title_____

(MUST BE SIGNED HERE IN HANDWRITING, IN INK.)

Sworn to and subscribed before me this _____ day of _____, 20_____

Notary Public_____ My Commission Expires: _____

INSTRUCTIONS FOR NON-COLLUSION AFFIDAVIT

1. This Non-collusion Affidavit is material to any contract awarded pursuant to this bid. According to the Pennsylvania Antibid-Rigging Act, 73 P.S. § 1611 et seq., governmental agencies may require Non-collusion Affidavits to be submitted together with bids.

2. This Non-collusion Affidavit must be executed by the member, officer or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.

3. Bid rigging and other efforts to restrain competition and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the Affidavit should examine it carefully before signing and assure himself or herself that each statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval or submission of the bid.

4. In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an Affidavit must be submitted separately on behalf of each party.

5. The term “complementary bid” as used in the Affidavit has the meaning commonly associated with that term in the bidding process, and includes the knowing submission of bids higher than the bid of another firm, any intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.

6. Failure to file an Affidavit in compliance with these instructions will result in disqualification of the bid.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

MBE/WBE PARTICIPATION: CCAC encourages the participation of minority and women-owned businesses in all of its contracts and is committed to providing maximum opportunities for qualified minority and/or women-owned business enterprises ("MBE/WBEs") to participate in its work. Bidder agrees (1) if qualified, to take reasonable and timely steps to obtain appropriate certification as an MBE and/or WBE, (2) to ensure that MBE and/or WBEs are appropriately considered as subcontractors and/or suppliers under this Agreement; and (3) to report moneys spent for MBE and/or WBE subcontractors and/or suppliers for work as CCAC may from time to time reasonably request. **CCAC's goal for MBE/WBE participation is 20% (13% MBE and 7% WBE/DBE).** Please provide documentation as to your firm's good faith effort to reach this goal by describing all applicable details of MBE/WBE participation that may be included in the resulting agreement.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

MINORITY PARTICIPATION GOALS – BID PROPOSAL NO. 1139

The following must be included with your bid.

Reference: General Conditions for Construction and Renovation Contracts - Item 6, Page 2 – Minority & Disadvantaged Participation Goals

A 20**%** M/W/DBE work participation is established (13% MBE and 7% WBE/DBE). Document your firm's good faith effort to obtain the 20**%** Goal:

M/W/DBE Company	Contact Person	Phone Number	$Amount or Objective %
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

_____ I am an M/W/DBE. (ATTACH CERTIFICATION)

Total: _____

Bidder acknowledges that CCAC may communicate with listed firms to verify the extent of the contact.

Bidding Company's Name:_____

Signature:_____ Title:_____

Date:_____

Revised: 9/14/21

RETURN FORM 4.0

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

BID PROPOSAL NO. 1139

COMMONWEALTH OF PENNSYLVANIA
BID AWARD & RETENTION LAW
ACT NO. 1978-317, SENATE BILL 68, NOVEMBER 26, 1978

EXTENSION OF CONTRACT EXECUTION REQUIREMENTS

In the event the contract(s)/purchase order(s) resulting from the above specified bid proposal is/are in excess of $50,000.00, the above specified Act will apply.

This Act requires the awarding of a contract to the lowest responsible bidder within sixty (60) days of the date of bid opening and the execution of a contract within thirty (30) days after award by the College Board of Trustees. Thirty (30) day extensions of the date for award and for execution are permitted by the mutual written consent of the College and the successful bidder.

Due to the extent of the approval actions required prior to award and execution of any contract, it may not be possible for the College to complete contract award and execution within the sixty (60) day and thirty (30) day periods. Accordingly, each bidder is requested to indicate their agreement with a thirty (30) day extension of the sixty (60) day award date and thirty (30) day execution date by signing this form and returning it with their bid.

_____

Name of Company

_____

Authorized Company Representative

_____ _____

Signature Title

MUST BE SIGNED HERE IN HANDWRITING, IN INK

RETURN FORM 5.0

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

GENERAL CONDITIONS

FOR

CONSTRUCTION AND RENOVATION CONTRACTS

1. PERMITS

It is the responsibility of the contractor to obtain all permits and/or licenses required by Federal, State, County, City, or other local Municipalities or Authorities for work done or services performed under this contract.

2. ROLE OF CONTRACTOR

In the performance of the work hereunder, the contractor shall act as an independent contractor, and all of his agents, employees, and subcontractors shall be subject solely to the control, supervision, and authority of the contractor.

3. EMPLOYEES OF THE CONTRACTOR

It is understood that the contractor in signing the contract will employ only competent and first-class workmen and mechanics; that no workmen shall be regarded as competent and first-class except those who are duly skilled in their respective branches of labor.

4. BONDS

The College will accept only bonds written by surety companies authorized to do business in the Commonwealth of Pennsylvania and the County of Allegheny and included on the United States Treasury Department Annual List of Surety Companies published July first of each year. Limits for those companies appearing on the United States Treasury Department's list cannot be exceeded. This list is available for inspection in the Purchasing Department, Community College of Allegheny County, Administration Building, 800 Allegheny Avenue, Pittsburgh, Pennsylvania 15233. It is also available from the Surety Bond Branch, Financial Management Services, Department of the Treasury, Washington, D.C. 20226. Phone: 1.202.634.2214.

5. EQUAL OPPORTUNITY

Contractor and all subcontractors shall not discriminate against any employee or applicant for employment because of race, color, creed, national origin, or sex. Contractor and all subcontractors shall also comply with all applicable Federal, State, and local Fair Employment Practice Acts, or similar Acts, Rules, and Regulations and whether or not applicable will comply with the Federal Civil Rights Act of 1964. The Terms and Provisions of Executive Order 11246 and any Executive Order modifying or superseding same, are incorporated herein with respect to any work subject thereto.

The contractor and all subcontractors shall, in all solicitations or advertisements for employees placed by them or their behalf state all qualified applicants will receive consideration for employment without regard to race, religion, color, sex, or national origin.

6. MINORITY & DISADVANTAGED PARTICIPATION GOALS

The College's goal is to obtain 20**%** MBE/WBE/DBE (13% Minority-owned Business enterprise/7% Woman-owned Business Enterprise/Disadvantaged Business Enterprise) participation in the work. This is to be based on the dollar value of employment, subcontracts, supplies, goods, and services as a percentage of the total contract amount. The bidder/contractor must demonstrate to the College prior to award of the contract, and periodically thereafter throughout the term of the contract, their compliance and continued ability to comply with these goals.

The contractor shall submit with their bid (on Return Form 4.0) a completed Minority & Disadvantaged Contractor Commitment Plan that will contain the details of how they plan to comply with this goal should they be awarded the contract.

If the plan is not submitted in the bid or is not acceptable, the College may deem the bid non-responsive and may award the work to the next lowest responsive bidder with an acceptable plan. Thus, it behooves all bidders to formulate their M/W/DBE plan before submitting a bid.

Finding Certified M/W/DBE's - All subcontractors and suppliers of goods and services used to comply with this goal must be **certified** minority or disadvantaged firms. They may be certified by any recognized and reputable organization such as the following: African American Chamber of Commerce, Allegheny County, Port Authority of Allegheny County, City of Pittsburgh, Pittsburgh Regional Minority Purchasing Council, Commonwealth of Pennsylvania, United States Federal Government.

If the firm is not certified and desires to be certified, it is suggested that they contact one of the following organizations. These organizations may also be used as references for sourcing M/W/DBE firms.

Allegheny County
M/W/DBE Department
County Office Building Rm 204
542 Forbes Avenue
Pittsburgh, Pennsylvania 15219
412.350.4309

EMSDC
Regional Enterprise Tower
425 Sixth Avenue
Suite 401
Pittsburgh, Pennsylvania 15219
412.391.4423

Diversity Business Resource Center
700 River Avenue Suite 231
Pittsburgh, PA 15212
412.322.3272

African American Chamber of Commerce
Koppers Building
436 Seventh Avenue, Suite 2220
Pittsburgh, PA 15219
412.391.0610

A list of PA certified M/W/DBE firms can be found on the Internet at **http://www.paucp.com**.

The College expects all firms to demonstrate a good faith effort to include M/W/DBE's when bidding on College contracts. A good faith effort as defined by the Code of Federal Regulations (49CFR26) means "*efforts to achieve a DBE goal or other requirement of this part which, by their scope, intensity, and appropriateness to the objective, can reasonably be expected to fulfill the program requirement".*

If you are not successful in securing M/W/DBE participation after a good faith effort is made, provide the following in your waiver request:

- A detailed account of your efforts;
- Your normal business practice and/or inventory profile; and
- An active diversity plan/policy

Reporting During and After Project Completion - The contractor shall submit with their monthly application for payment a written M/W/DBE Contractor Report demonstrating their compliance with the goal. The report shall state the dollar amount spent on labor, materials, services, and subcontracts and shall list firm names and vendor names. At the completion of the project, with final application for payment, the contractor shall submit a recap of their compliance which shall state the dollar amount spent on labor, materials, subcontracts, and services as a percentage of the total contract amount. Projects with shorter timeframes shall require a one-time only report at the completion of the project. Reports are to be accompanied by back-up documentation evidencing the business relationship with the M/W/DBE for the particular project (e.g.: copies of invoices, purchase orders, or evidence of payments).

Failure to Comply With M/W/DBE Goals – If the contractor fails to make a good faith effort (as determined by the College) to comply with the College's 20% M/W/DBE goal or fails to meet their M/W/DBE commitment or to submit documentation as required by the College, the College may consider such non-compliance or breach of contract and any one or more of the following may occur:

- Rejection of the bid
- Forfeiture of bid guaranty
- Termination of the contract
- The imposing of sanctions as deemed appropriate by the College
- Contractor being barred from bidding on College contracts for up to three (3) years
- Or such other remedy as the College deems appropriate

7. FINANCIAL INTEREST

All bidders for construction must be established firms competent to perform the required scope of work. All bidders must satisfy the Community College of Allegheny County that they have the requisite organization, capital, plant, stock, ability, and experience to satisfactorily execute and contract in accordance with the provisions of the contract in which they are interested.
If the contractor's base bid is $25,000.00 or more, the American Institute of Architects form, "Contractors Qualification Statement" form A305 - 1986 (or latest revision) may be requested by CCAC. This form is available from the American Institute of Architects, 1735 New York Avenue N.W., Washington, D.C. 20006. If requested by CCAC, a completed form A305 is to be submitted within 48 business hours and may be faxed to 412.237.3195.

8. EMPLOYMENT OF INDEPENDENT SUBCONTRACTORS

If you are a contractor to the College and the value of the base contract is $25,000.00 or more, you must secure approval of all proposed subcontractors from the College prior to beginning work. Information on your proposed subcontractors is to be submitted on the form entitled Proposed Subcontractors.

Each proposed subcontractor to be employed must be an independent contractor "in fact" and must meet the following criteria:

a. The subcontractor must have a Federal identification number.

b. The subcontractor must perform these same services for others.

c. The subcontractor must have an established place of business.

d. The subcontractor must use their own tools and equipment.

e. The subcontractor must pay all taxes and other items required by law to be paid by an employer with respect to compensation paid to their employees.

f. The subcontractor must provide and maintain all insurance required by law and the College.

If the proposed subcontractor does not meet all of these criteria, they will not be approved.

9. VERBAL AUTHORIZATIONS

No verbal agreement or understanding with any officer, agent, or employee of the College either before or after the execution of the contract shall alter, amend, modify, or rescind any of the terms or provisions contained in any of the contract documents. This provision shall not limit or affect the right to make changes or variations in the work. Any changes must be authorized in writing.

10. APPLICABLE LAW, ACTS, AND ORDINANCES

The contractor(s) shall agree to abide by and be bound by all applicable provisions and regulations of all laws, acts, and ordinances relating to and regulating the hours and conditions of employment.

11. PENNSYLVANIA PREVAILING WAGE ACT

The Pennsylvania Prevailing Wage Act shall be incorporated into and made part of all College construction related contract(s) having an estimated value of $25,000.00 or more.

It is the responsibility of the contractor to ensure that they have included the appropriate Pennsylvania prevailing wage rates in their proposal to the College. Failure to do this will not be a reason for the contractor to withdraw their bid or fail to perform the contract or to request additional payments from the College.

In accordance with the Prevailing Wage Determination Act, the contractor(s) shall:

a. Pay no less than the wage rates including contributions for employee benefits as determined in the decision of the Secretary of Labor and Industry and shall comply with the conditions of the Pennsylvania Prevailing Wage Act approved August 15, 1961 (Act No. 442) as amended August 9, 1963 and/or subsequent amendments thereof (Act No. 342) and the regulations issued pursuant thereto.

b. Apply all applicable provisions of the Acts and Laws to all work performed on the contract by the contractor(s) and subcontractor(s).

c. Insert in each of his subcontracts all of the stipulations contained in these required provisions and such other stipulations as may be required.

d. Assure that no workmen be employed on the public work except in accordance with the classifications set forth in the decisions of the Secretary. In the event that additional or different classifications are necessary, the procedure set forth in Section 7 of the above referenced Regulations shall be followed.

e. Assure that all workmen employed or working on this contract shall be paid unconditionally regardless of whether any contractual relationship exists or the nature of any contractual relationship which may be alleged to exist between any contractor, subcontractor, and workmen not less than once a week without deduction or debate on any account either directly or indirectly except authorized deductions, the full amounts due at the time of payment computed at the rates applicable to the time worked on the appropriate classification. Nothing in this contract, the Act or these Regulations, prohibits the payment of more than the general prevailing minimum wage rates as determined by the Secretary to any workmen on public work.

f. Each subcontractor shall post for the entire period of construction the wage determination decisions of the Secretary including the effective date of any charges thereof in a prominent and easily accessible place or places at the site of the work and at such place or places used by them to pay workmen their wages. The posted notice of wage rates must contain the following information:

   1. Name of project.

   2. Name of public body for which it is being constructed.

3. The crafts and classifications of workmen listed in the Secretary's general prevailing minimum wage rate determination for the particular project.
4. The general prevailing minimum wage rates determined for each craft and classification and the effective date of any changes.

5. A statement advising workmen that if they have been paid less than the general prevailing minimum wage rate for their job classification or that the contractor and/or subcontractor are not complying with the Act or these Regulations in any manner whatsoever they may file a protest with the Secretary of Labor and Industry. Any Workmen paid less than the rate specified in the contract shall have a civil right of action for the difference between the wage paid and the wages stipulated in the contract, which right of action must be exercised within six months from the occurrence of the event creating such right.

g. All subcontractors shall keep an accurate record showing the name, craft, and/or classification, number of hours worked per day, and the actual hourly rate of wage paid (including employee benefits) to each workman employed by him in connection with the public work and such record must include any deductions from each workman. The record shall be preserved for two years from the date of payment and shall be open at all reasonable hours to the inspection of the public body awarding the contract and to the Secretary or his duly authorized representative.

h. Assure that apprentices shall be limited to such numbers as shall be in accordance with a bonafide apprenticeship program registered with and approved by the Pennsylvania Apprenticeship and Training Council and only apprentices whose training and employment are in full compliance with the provisions of the Apprenticeship and Training Act approved July 14, 1961 (Act No. 304) and the Rules and Regulations issued pursuant thereto shall be employed on the public work project. Any workman using the tools of a craft who does not qualify as an apprentice within the provisions of this subsection shall be paid at the rate predetermined for journeymen in that particular craft and/or classification.

i. Pay wages without any deductions except authorized deductions. Employers not parties to a contract requiring contributions for employee benefits which the Secretary has determined to be included in the general prevailing minimum wage rate shall pay the monetary equivalent thereof directly to the workmen.

j. Be advised that payment of compensation to workmen for work performed on public work on a lump sum basis, or a piece work system, or a price certain for the completion of a certain amount of work, or the production of a certain result shall be deemed a violation of the Act and these Regulations regardless of the average hourly earnings resulting therefrom.

k. Each subcontractor shall file a statement each week and a final statement at the conclusion of the work on the contract with the contracting agency under oath and in form satisfactory to the Secretary certifying that all workmen have been paid wages in strict conformity with the provisions of the contract as prescribed by Section 3 of these Regulations; or, if any wages remain unpaid, to set forth the amount of wages due and owing to each workman respectively. The College shall require the contractor and all subcontractors to file weekly wage certifications utilizing form WH-347. (Reference: Section 10(a) of Act and Section 10 of Regulations). Prior to making final payment the College will require final wage certifications from all contractors and subcontractors.

12. PAYMENT TO CONTRACTORS

The College maintains the right to withhold a percentage of monies requested by contractors for work done under this contract in accordance with the American Institute of Architects Application for Payment form G-702 as indicated in Section 01152--Applications for Payment of the technical specifications.

13. INSURANCE REQUIREMENT

A properly executed certificate of insurance must be submitted with the signed Contract Articles of Agreement. The certificate of insurance must show that the contractor and subcontractors comply with the College's insurance requirements. The certificate of insurance must state that in the event any coverage shown is to be cancelled the College will be given a thirty day advance notice of the cancellation.

14. MINORITY BIDDERS

The Community College of Allegheny County hereby notifies all bidders that it will affirmatively ensure that minority business enterprises will be afforded full opportunity to submit bids in response to this invitation and will not be discriminated against on the grounds of race, color, or national origin in consideration for an award.

15. MODIFICATION AND WITHDRAWAL OF BIDS

a. Bids may be modified or withdrawn by an appropriate document duly executed (in the manner that a Bid must be executed) and delivered to the place where Bids are to be submitted at any time prior to the opening of Bids.

b. Bidders may withdraw their bid within two (2) business days of the bid opening only within accordance of Commonwealth of Pennsylvania public bidding law.

16. TAXES

CCAC is a governmental entity and is generally exempt from sales and use tax with respect to purchases of building machinery and equipment. A tax exemption certificate will be provided upon request. It is the bidder's responsibility to pay any/all applicable taxes on non-exempt equipment, supplies and services in accordance with applicable law.

17. PENNSYLVANIA STEEL PRODUCTS PROCUREMENT ACT

Contractor acknowledges that CCAC is a public agency subject to the requirements of the Pennsylvania Steel Products Procurement Act, 73 P.S. Section 1881 et. seq (the "SPPA"). Contractor therefore represents and warrants that any and all steel products purchased, used or supplied by it in the performance of the Contract will be melted and manufactured in the United States, and that its performance hereunder will otherwise comply with requirements of the SPPA at all times. Contractor further agrees to provide CCAC with documentation and/or certification of its compliance with the foregoing requirements, as required under the SPPA, and acknowledges that it shall not be entitled to receive payment hereunder until such documentation and/or certification has been provided.

18. MARKUPS ON CHANGE ORDERS

Markups on change order requests shall not exceed 15%. This would apply to overhead and profit, labor, materials, equipment, etc.

Revised 9/14/21

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project Name:	Doors, Hardware, and Access Control Phase 1 - Homewood Brushton Center
General Description:	Modify exterior doors, hardware, and access control at Homewood Brushton Center
Project Locality	Pittsburgh
Awarding Agency:	Community College of Allegheny County
Contract Award Date:	5/1/2025
Serial Number:	25-03256
Project Classification:	Building
Determination Date:	3/26/2025
Assigned Field Office:	Pittsburgh
Field Office Phone Number:	(412)565-5300
Toll Free Phone Number:	(877)504-8354
Project County:	Allegheny County

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Asbestos & Insulation Workers	8/1/2023		$42.40	$29.01	$71.41
Asbestos & Insulation Workers	8/1/2024		$43.40	$29.51	$72.91
Boilermakers	6/1/2016		$40.90	$27.61	$68.51
Bricklayer	6/1/2024		$40.25	$25.34	$65.59
Bricklayer	12/1/2024		$41.00	$25.59	$66.59
Carpenters - Piledriver/Welder	1/1/2023		$40.63	$21.22	$61.85
Carpenters - Piledriver/Welder	1/1/2024		$42.13	$21.97	$64.10
Carpenters - Piledriver/Welder	1/1/2025		$43.38	$22.72	$66.10
Carpenters - Piledriver/Welder	1/1/2026		$44.63	$23.47	$68.10
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2023		$39.69	$19.93	$59.62
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2024		$41.49	$19.93	$61.42
Carpenters, Drywall Hangers, Framers, Instrument Men, Lathers, Soft Floor Layers	6/1/2025		$43.34	$19.93	$63.27
Cement Masons	6/1/2023		$33.07	$23.59	$56.66
Cement Masons	7/1/2024		$34.57	$25.09	$59.66
Drywall Finisher	6/1/2023		$32.39	$23.75	$56.14
Drywall Finisher	6/1/2024		$34.01	$24.88	$58.89
Electricians & Telecommunications Installation Technician	12/22/2023		$48.61	$31.80	$80.41
Electricians & Telecommunications Installation Technician	12/27/2024		$50.86	$32.69	$83.55
Electricians & Telecommunications Installation Technician	12/26/2025		$54.16	$32.69	$86.85
Elevator Constructor	1/1/2023		$56.14	$42.83	$98.97
Elevator Constructor	1/1/2024		$58.55	$43.87	$102.42
Elevator Constructor	1/1/2025		$61.07	$40.05	$101.12
Glazier	9/1/2023		$35.65	$30.05	$65.70
Iron Workers	6/1/2023		$38.89	$35.02	$73.91
Iron Workers	6/1/2024		$39.89	$36.47	$76.36
Laborers (Class 01 - See notes)	1/1/2023		$25.82	$19.46	$45.28
Laborers (Class 01 - See notes)	1/1/2024		$26.82	$19.46	$46.28
Laborers (Class 01 - See notes)	1/1/2025		$27.32	$19.96	$47.28
Laborers (Class 01 - See notes)	1/1/2026		$27.82	$20.46	$48.28
Laborers (Class 02 - See notes)	1/1/2023		$25.97	$19.46	$45.43
Laborers (Class 02 - See notes)	1/1/2024		$26.97	$19.46	$46.43
Laborers (Class 02 - See notes)	1/1/2025		$27.47	$19.96	$47.43
Laborers (Class 02 - See notes)	1/1/2026		$27.97	$20.46	$48.43
Laborers (Class 03 - See notes)	1/1/2023		$28.97	$19.46	$48.43
Laborers (Class 03 - See notes)	1/1/2024		$29.97	$19.46	$49.43
Laborers (Class 03 - See notes)	1/1/2025		$30.47	$19.96	$50.43
Laborers (Class 03 - See notes)	1/1/2026		$30.97	$20.46	$51.43
Laborers (Class 04 - See notes)	1/1/2021		$23.57	$19.32	$42.89
Landscape Laborer (Skilled)	1/1/2024		$24.79	$18.53	$43.32
Landscape Laborer (Skilled)	1/1/2025		$25.79	$18.78	$44.57

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Landscape Laborer (Skilled)	1/1/2026		$26.79	$19.03	$45.82
Landscape Laborer (Tractor Operator)	1/1/2024		$25.09	$18.53	$43.62
Landscape Laborer (Tractor Operator)	1/1/2025		$26.09	$18.78	$44.87
Landscape Laborer (Tractor Operator)	1/1/2026		$27.09	$19.03	$46.12
Landscape Laborer	1/1/2024		$24.37	$18.53	$42.90
Landscape Laborer	1/1/2025		$25.37	$18.78	$44.15
Landscape Laborer	1/1/2026		$26.37	$19.03	$45.40
Millwright	6/1/2020		$41.68	$20.32	$62.00
Operators (Class 01 - see notes)	6/1/2022		$38.89	$23.69	$62.58
Operators (Class 01 - see notes)	6/1/2023		$40.69	$23.89	$64.58
Operators (Class 01 - see notes)	6/1/2024		$41.69	$24.39	$66.08
Operators (Class 01 - see notes)	6/1/2025		$42.72	$24.79	$67.51
Operators (Class 01 - see notes)	6/1/2026		$43.74	$25.29	$69.03
Operators (Class 02 -see notes)	6/1/2022		$32.82	$23.69	$56.51
Operators (Class 02 -see notes)	6/1/2023		$34.62	$23.89	$58.51
Operators (Class 02 -see notes)	6/1/2024		$35.62	$24.39	$60.01
Operators (Class 02 -see notes)	6/1/2025		$36.67	$24.79	$61.46
Operators (Class 02 -see notes)	6/1/2026		$37.67	$25.29	$62.96
Operators (Class 03 - See notes)	6/1/2022		$30.03	$23.69	$53.72
Operators (Class 03 - See notes)	6/1/2023		$31.83	$23.89	$55.72
Operators (Class 03 - See notes)	6/1/2024		$32.83	$24.39	$57.22
Operators (Class 03 - See notes)	6/1/2025		$33.88	$24.79	$58.67
Operators (Class 03 - See notes)	6/1/2026		$34.88	$25.29	$60.17
Painters Class 6 (see notes)	6/1/2023		$30.56	$24.01	$54.57
Painters Class 6 (see notes)	6/1/2024		$32.14	$24.93	$57.07
Painters Class 6 (see notes)	6/1/2025		$34.16	$25.81	$59.97
Piledrivers	1/1/2023		$39.13	$21.22	$60.35
Piledrivers	1/1/2024		$40.63	$21.97	$62.60
Piledrivers	1/1/2025		$41.88	$22.72	$64.60
Piledrivers	1/1/2026		$43.13	$23.47	$66.60
Plasterers	6/1/2023		$32.14	$20.54	$52.68
Plasterers	6/1/2024		$33.14	$21.04	$54.18
plumber	6/1/2023		$48.65	$25.87	$74.52
plumber	6/1/2024		$51.75	$25.87	$77.62
plumber	6/1/2025		$54.95	$25.87	$80.82
plumber	6/1/2026		$58.05	$25.87	$83.92
plumber	6/1/2027		$61.15	$25.87	$87.02
Pointers, Caulkers, Cleaners	12/1/2022		$35.47	$20.88	$56.35
Pointers, Caulkers, Cleaners	6/1/2024		$38.59	$21.36	$59.95
Pointers, Caulkers, Cleaners	12/1/2024		$39.69	$21.61	$61.30
Roofers	6/1/2023		$37.00	$19.92	$56.92
Roofers	6/2/2024		$38.00	$20.67	$58.67
Sheet Metal Workers	8/1/2023		$41.00	$32.94	$73.94
Sheet Metal Workers	7/1/2024		$43.00	$33.96	$76.96

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Building	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Sign Makers and Hangars	7/15/2023		$31.76	$24.63	$56.39
Sign Makers and Hangars	7/15/2024		$32.32	$25.82	$58.14
Sprinklerfitters	7/1/2023		$43.84	$25.50	$69.34
Sprinklerfitters	1/1/2024		$43.28	$26.06	$69.34
Sprinklerfitters	7/1/2024		$45.38	$26.46	$71.84
Sprinklerfitters	1/1/2025		$44.79	$27.05	$71.84
Steamfitters	6/1/2023		$46.10	$28.37	$74.47
Steamfitters	6/1/2024		$48.15	$29.57	$77.72
Stone Masons	6/1/2024		$42.35	$23.97	$66.32
Stone Masons	12/1/2024		$43.10	$24.22	$67.32
Terrazzo Finisher	6/1/2023		$39.79	$18.47	$58.26
Terrazzo Finisher	12/1/2024		$41.04	$18.72	$59.76
Terrazzo Mechanics	12/1/2022		$35.49	$20.32	$55.81
Terrazzo Mechanics	6/1/2024		$39.14	$20.77	$59.91
Terrazzo Mechanics	12/1/2024		$40.39	$21.02	$61.41
Tile Finisher	12/1/2022		$28.76	$17.34	$46.10
Tile Finisher	6/1/2024		$31.56	$17.74	$49.30
Tile Finisher	12/1/2024		$32.51	$17.99	$50.50
Tile Setter	12/1/2022		$35.64	$21.81	$57.45
Tile Setter	6/1/2024		$38.46	$22.19	$60.65
Tile Setter	12/1/2024		$39.41	$22.44	$61.85
Truckdriver class 1(see notes)	1/1/2023		$33.18	$22.21	$55.39
Truckdriver class 1(see notes)	1/1/2024		$34.93	$22.71	$57.64
Truckdriver class 1(see notes)	1/1/2025		$36.43	$23.21	$59.64
Truckdriver class 1(see notes)	1/1/2026		$37.93	$23.71	$61.64
Truckdriver class 2 (see notes)	1/1/2023		$33.64	$22.52	$56.16
Truckdriver class 2 (see notes)	1/1/2024		$35.39	$23.02	$58.41
Truckdriver class 2 (see notes)	1/1/2025		$36.89	$23.52	$60.41
Truckdriver class 2 (see notes)	1/1/2026		$38.39	$24.02	$62.41
Window Film / Tint Installer	10/1/2019		$25.00	$2.63	$27.63

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Carpenter	1/1/2023		$38.60	$20.59	$59.19
Carpenter	1/1/2024		$40.10	$21.34	$61.44
Carpenter	1/1/2025		$41.35	$22.09	$63.44
Carpenter	1/1/2026		$42.60	$22.84	$65.44
Carpenter Welder	1/1/2023		$40.10	$20.59	$60.69
Carpenter Welder	1/1/2024		$41.60	$21.34	$62.94
Carpenter Welder	1/1/2025		$42.85	$22.09	$64.94
Carpenter Welder	1/1/2026		$44.10	$22.84	$66.94
Carpenters - Piledriver/Welder	1/1/2023		$40.63	$21.22	$61.85
Carpenters - Piledriver/Welder	1/1/2024		$42.13	$21.97	$64.10
Carpenters - Piledriver/Welder	1/1/2025		$43.38	$22.72	$66.10
Carpenters - Piledriver/Welder	1/1/2026		$44.63	$23.47	$68.10
Cement Finishers	1/1/2023		$34.14	$25.05	$59.19
Cement Finishers	1/1/2024		$35.14	$26.30	$61.44
Cement Finishers	1/1/2025		$35.94	$27.50	$63.44
Cement Masons	1/1/2020		$32.84	$21.10	$53.94
Electric Lineman	5/29/2023		$52.56	$29.99	$82.55
Electric Lineman	6/3/2024		$53.97	$31.05	$85.02
Electricians & Telecommunications Installation Technician	12/22/2023		$48.61	$31.80	$80.41
Electricians & Telecommunications Installation Technician	12/27/2024		$51.76	$31.80	$83.56
Electricians & Telecommunications Installation Technician	12/26/2025		$55.06	$31.80	$86.86
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2023		$38.89	$35.02	$73.91
Iron Workers (Bridge, Structural Steel, Ornamental, Precast, Reinforcing)	6/1/2024		$39.89	$36.47	$76.36
Laborers (Class 01 - See notes)	1/1/2023		$29.95	$25.50	$55.45
Laborers (Class 01 - See notes)	1/1/2024		$32.20	$25.50	$57.70
Laborers (Class 01 - See notes)	1/1/2025		$33.70	$26.00	$59.70
Laborers (Class 01 - See notes)	1/1/2026		$34.70	$27.00	$61.70
Laborers (Class 02 - See notes)	1/1/2023		$30.11	$25.50	$55.61
Laborers (Class 02 - See notes)	1/1/2024		$32.36	$25.50	$57.86
Laborers (Class 02 - See notes)	1/1/2025		$33.86	$26.00	$59.86
Laborers (Class 02 - See notes)	1/1/2026		$34.86	$27.00	$61.86
Laborers (Class 03 - See notes)	1/1/2023		$30.50	$25.50	$56.00
Laborers (Class 03 - See notes)	1/1/2024		$32.75	$25.50	$58.25
Laborers (Class 03 - See notes)	1/1/2025		$34.25	$26.00	$60.25
Laborers (Class 03 - See notes)	1/1/2026		$35.25	$27.00	$62.25
Laborers (Class 04 - See notes)	1/1/2023		$30.95	$25.50	$56.45
Laborers (Class 04 - See notes)	1/1/2024		$33.20	$25.50	$58.70
Laborers (Class 04 - See notes)	1/1/2025		$34.70	$26.00	$60.70
Laborers (Class 04 - See notes)	1/1/2026		$35.70	$27.00	$62.70
Laborers (Class 05 - See notes)	1/1/2023		$31.36	$25.50	$56.86
Laborers (Class 05 - See notes)	1/1/2024		$33.61	$25.50	$59.11

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Laborers (Class 05 - See notes)	1/1/2025		$35.11	$26.00	$61.11
Laborers (Class 05 - See notes)	1/1/2026		$36.11	$27.00	$63.11
Laborers (Class 06 - See notes)	1/1/2023		$28.20	$25.50	$53.70
Laborers (Class 06 - See notes)	1/1/2024		$30.45	$25.50	$55.95
Laborers (Class 06 - See notes)	1/1/2025		$31.95	$26.00	$57.95
Laborers (Class 06 - See notes)	1/1/2026		$32.95	$27.00	$59.95
Laborers (Class 07 - See notes)	1/1/2023		$30.95	$25.50	$56.45
Laborers (Class 07 - See notes)	1/1/2024		$33.20	$25.50	$58.70
Laborers (Class 07 - See notes)	1/1/2025		$34.70	$26.00	$60.70
Laborers (Class 07 - See notes)	1/1/2026		$35.70	$27.00	$62.70
Laborers (Class 08 - See notes)	1/1/2023		$32.45	$25.50	$57.95
Laborers (Class 08 - See notes)	1/1/2024		$34.70	$25.50	$60.20
Laborers (Class 08 - See notes)	1/1/2025		$36.20	$26.00	$62.20
Laborers (Class 08 - See notes)	1/1/2026		$37.20	$27.00	$64.20
Millwright	6/1/2023		$45.50	$23.72	$69.22
Millwright	6/1/2024		$47.59	$23.72	$71.31
Millwright	6/1/2025		$49.72	$23.72	$73.44
Operators (Class 01 - see notes)	1/1/2023		$36.79	$23.58	$60.37
Operators (Class 01 - see notes)	1/1/2024		$38.59	$24.03	$62.62
Operators (Class 01 - see notes)	1/1/2025		$40.39	$24.23	$64.62
Operators (Class 01 - see notes)	1/1/2026		$41.96	$24.66	$66.62
Operators (Class 02 -see notes)	1/1/2023		$36.53	$23.58	$60.11
Operators (Class 02 -see notes)	1/1/2024		$38.33	$24.03	$62.36
Operators (Class 02 -see notes)	1/1/2025		$40.13	$24.23	$64.36
Operators (Class 02 -see notes)	1/1/2026		$41.70	$24.66	$66.36
Operators (Class 03 - See notes)	1/1/2023		$32.88	$23.58	$56.46
Operators (Class 03 - See notes)	1/1/2024		$34.68	$24.03	$58.71
Operators (Class 03 - See notes)	1/1/2025		$36.48	$24.23	$60.71
Operators (Class 03 - See notes)	1/1/2026		$38.05	$24.66	$62.71
Operators (Class 04 - See notes)	1/1/2023		$32.42	$23.58	$56.00
Operators (Class 04 - See notes)	1/1/2024		$34.22	$24.03	$58.25
Operators (Class 04 - See notes)	1/1/2025		$36.02	$24.23	$60.25
Operators (Class 04 - See notes)	1/1/2026		$37.59	$24.66	$62.25
Operators (Class 05 - See notes)	1/1/2023		$32.17	$23.58	$55.75
Operators (Class 05 - See notes)	1/1/2024		$33.97	$24.03	$58.00
Operators (Class 05 - See notes)	1/1/2025		$35.77	$24.23	$60.00
Operators (Class 05 - See notes)	1/1/2026		$37.34	$24.66	$62.00
Operators Class 1-A	1/1/2023		$39.79	$23.58	$63.37
Operators Class 1-A	1/1/2024		$41.59	$24.03	$65.62
Operators Class 1-A	1/1/2025		$43.39	$24.23	$67.62
Operators Class 1-A	1/1/2026		$44.96	$24.66	$69.62
Operators Class 1-B	1/1/2023		$38.79	$23.58	$62.37
Operators Class 1-B	1/1/2024		$40.59	$24.03	$64.62
Operators Class 1-B	1/1/2025		$42.39	$24.23	$66.62

BUREAU OF LABOR LAW COMPLIANCE
PREVAILING WAGES PROJECT RATES

Project: 25-03256 - Heavy/Highway	Effective Date	Expiration Date	Hourly Rate	Fringe Benefits	Total
Operators Class 1-B	1/1/2026		$43.96	$24.66	$68.62
Painters Class 1 (see notes)	6/1/2022		$34.45	$22.82	$57.27
Painters Class 2 (see notes)	6/1/2023		$36.01	$24.01	$60.02
Painters Class 2 (see notes)	6/1/2024		$38.09	$24.93	$63.02
Painters Class 2 (see notes)	6/1/2025		$40.36	$25.81	$66.17
Painters Class 3 (see notes)	6/1/2023		$38.33	$24.01	$62.34
Painters Class 3 (see notes)	6/1/2024		$40.66	$24.93	$65.59
Painters Class 3 (see notes)	6/1/2025		$43.69	$25.81	$69.50
Painters Class 4 (see notes)	6/1/2019		$28.20	$20.06	$48.26
Painters Class 5 (see notes)	6/1/2019		$22.91	$20.06	$42.97
Pile Driver Divers (Building, Heavy, Highway)	1/1/2023		$58.70	$21.22	$79.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2024		$60.95	$21.97	$82.92
Pile Driver Divers (Building, Heavy, Highway)	1/1/2025		$62.82	$22.72	$85.54
Pile Driver Divers (Building, Heavy, Highway)	1/1/2026		$64.70	$23.47	$88.17
Piledrivers	1/1/2023		$39.13	$21.22	$60.35
Piledrivers	1/1/2024		$40.63	$21.97	$62.60
Piledrivers	1/1/2025		$41.88	$22.72	$64.60
Piledrivers	1/1/2026		$43.13	$23.47	$66.60
Steamfitters (Heavy and Highway - Gas Distribution)	5/1/2022		$48.43	$40.28	$88.71
Truckdriver class 1(see notes)	1/1/2023		$33.18	$22.21	$55.39
Truckdriver class 1(see notes)	1/1/2024		$34.93	$22.71	$57.64
Truckdriver class 1(see notes)	1/1/2025		$36.43	$23.21	$59.64
Truckdriver class 1(see notes)	1/1/2026		$37.93	$23.71	$61.64
Truckdriver class 2 (see notes)	1/1/2023		$33.64	$22.52	$56.16
Truckdriver class 2 (see notes)	1/1/2024		$35.39	$23.02	$58.41
Truckdriver class 2 (see notes)	1/1/2025		$36.89	$23.52	$60.41
Truckdriver class 2 (see notes)	1/1/2026		$38.39	$24.02	$62.41

COMMUNITY COLLEGE OF ALLEGHENY COUNTY
800 ALLEGHENY AVENUE, PITTSBURGH PA 15233

_____
Bond Number

P E R F O R M A N C E B O N D

Know all men by these Presents that we _____**"TO BE COMPLETED ONLY BY AWARDEE"**____ (hereinafter called "Principal") as Principal, and _____ authorized to do business in the Commonwealth of Pennsylvania (hereinafter called "Surety") as Surety, are held and firmly bound unto the Community College of Allegheny County, through its Board of Trustees, _____ in the sum of _____

_____

to be paid to the said College aforesaid, its certain attorney, or assigns. To which payment will and truly be made, said principal and said surety to bind themselves their respective successors or assigns jointly and severally, firmly by these presents.

WITNESS our hands and seals, the _____ day of _____ 20____.

WHEREAS the above bounded _____

_____ has filed with the Community College of Allegheny County, proposals for the _____

The Condition of the above Obligation is such that if the said _____ shall perform _____

_____

In accordance with the agreement between _____ and the Community College of Allegheny County of even date herewith and the specifications and proposals attached to and made part of the agreement, and shall indemnify and save harmless the said Community College of Allegheny County from all liens, charges, demands, loss and damages of every kind and nature, whatsoever. Then this obligation to be void, otherwise to be and remain in full force and virtue.

Attest:

_____ (SEAL)
CONTRACTOR

_____ _____ (SEAL)
SECRETARY PRESIDENT

Signed, Sealed and delivered in presence of

_____ (SEAL)
SURETY COMPANY

_____ _____ (SEAL)
ADDRESS

_____ (SEAL)
TITLE

COMMUNITY COLLEGE OF ALLEGHENY COUNTY
800 ALLEGHENY AVENUE, PITTSBURGH PA 15233

LABOR AND MATERIAL

P A Y M E N T B O N D

KNOW ALL MEN BY THESE PRESENTS:

That we_____ **"TO BE COMPLETED ONLY BY AWARDEE"** _____

_____ as Principal

hereinafter called Principal, and _____

_____ as Surety, hereinafter called Surety, are held and firmly bound unto the

COMMUNITY COLLEGE OF ALLEGHENY COUNTY, through its Board of Trustees as Obligee, hereinafter called Owner, for the use and benefit of claimants as hereinbelow defined, in the amount of _____

_____ Dollars ($_____),

for the payment whereof Principal and Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, Principal has by written agreement, dated _____ 20_____, entered into a contract with Owner for _____

in accordance with drawings and specifications prepared by_____

(Here insert full name, title and address)

_____which contract is by reference made a part hereof, and is hereinafter referred to as the Contract.

NOW, THEREFORE, THE CONDITION OF THIS OBLIGATION is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and material used or reasonably required for use in the performance of the Contract, then this obligation shall be void; otherwise it shall remain in full force and effect, subject, however, to the following conditions:

(1) A claimant is defined as one having a direct contract with the Principal or with a sub-contractor of the Principal for labor, material, or both used or reasonably required for use in the performance of the contract, labor and material being construed to include that part of water, gas, power, light, heat, oil, gasoline, telephone service or rental of equipment directly applicable to the Contract.

(2) The above-named Principal and Surety hereby jointly and severally agree with the Owner that every claimant as herein defined, who has not been paid in full before the expiration of a period of ninety (90) days after the date on which the last of such claimant's work or labor was done or performed, or materials were furnished by such claimant, may sue on this bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant, and have execution thereon. The Owner shall not be liable for the payment of any costs or expenses of any such suit.

(3) No suit or action shall be commenced hereunder by any claimant.

(a) Unless claimant, other than one having a direct contract with the Principal, shall have given written notice to any two of the following: The Principal, the Owner, or the Surety above-named, within ninety (90) days after such claimant did or performed the last of the work or labor, or furnished the last of the materials for which said claim is made, stating with substantial accuracy the amount claimed and the name of the party to whom the materials were furnished, or for whom the work or labor was done or performed. Such notice shall be served by mailing the same by registered mail or certified mail, postage prepaid, in an envelope addressed to the Principal, Owner or Surety, at any place where an office is regularly maintained for the transaction of business, or served in any manner in which legal process may be served in the state in which the aforesaid project is located, save that such service need not be made by a public officer.

(b) After the expiration of one (1) year following the date on which Principal ceased work on said Contract, it being understood, however, that if any limitation embodied in this bond is prohibited by any law controlling the construction hereof such limitation shall be deemed to be amended so as to be equal to the minimum period of limitation permitted by such law.

(c) Other than in a state court of competent jurisdiction in and for the county or other political subdivision of the state in which the project, or any part thereof, is situated, or in the United States District Court for the district in which the project, or any part thereof, is situated, and not elsewhere.

(4) The amount of this bond shall be reduced by and to the extent of any payment or payments made in good faith hereunder, inclusive of the payment by Surety of mechanics' liens which may be filed of record against said improvement, whether or not claim for the amount of such lien be presented under and against this bond.

Signed and sealed this _____ day of _____ 20_____

_____ By_____
Witness (Seal) Principal

_____ By_____
Witness (Seal) Surety

This bond is issued simultaneously with performance bond in favor of the Owner conditioned on the full and faithful performance of the Contract.

Original – January 1980

MASTER SERVICES AGREEMENT

"Awardee Only"

Bid 1139

THIS MASTER SERVICES AGREEMENT ("Agreement") is made and entered into as of this ---- day of ----------, 2018, by and between **Community College of Allegheny County**, with a business office located at 800 Allegheny Avenue, Pittsburgh, PA 15233 (hereinafter referred to as the "College"), and ---------- (hereinafter referred to as "Contractor").

RECITALS

WHEREAS, the College has issued a Request for Quotation, Bid Solicitation, Request for Proposal, and/or a Purchase Order (hereinafter individually and collectively referred to as the "Order"), pursuant to

Bid Proposal No.	**Awardee Only**

which College seeks to procure certain work and services, as more fully described on the Order; and

WHEREAS, Contractor has submitted a proposal to the College to provide the services described in the Order, a copy of which is attached hereto as Exhibit A (hereinafter the "Proposal") and incorporated by reference;

WHEREAS, the College desires to engage Contractor to provide the services, pursuant to and in accordance with the terms and conditions that this Agreement set forth herein.

NOW, THEREFORE, in consideration of the premises and covenants that this Agreement contains, the receipt and adequacy of which are hereby acknowledged, the parties, intending to be legally bound, agree as follows:

1. Term. The term of this Agreement shall be as specified in the Order unless otherwise stated in the section below. If no date is specified, this Agreement shall begin with the date first stated above and terminate upon satisfactory completion of the services described herein.

AWARDEE ONLY

2. Services. Contractor shall fully and faithfully perform the work and services described in the Order and the Proposal and any specifications, scope of work or other documentation attached thereto. Contractor warrants that all work and services performed by or on behalf of it under this Agreement will conform to all terms and specifications set forth in the Order and in the Proposal.

3. Price/Fees: The College shall pay Contractor for the services and work performed by Contractor in accordance with the fees and/or prices set forth in the Proposal.

4. Terms and Conditions: This Agreement, and the services to be performed by Contractor hereunder, will be subject to and governed by College's Standard Terms and Conditions for the Purchase of Goods and Services ("Master Terms"), which are incorporated herein by reference. The Master Terms can be viewed and downloaded at https://www.ccac.edu/business/_files-business/purchase-terms-and-conditions.pdf. By signing below, Contractor acknowledges its receipt and acceptance of the Master Terms.

5. Insurance Requirements: In addition to the Master Terms, Contractor shall comply with the insurance and indemnification requirements set forth on Exhibit B, which are incorporated herein by reference. Prior to commencing performance of the Services, Contractor shall furnish to the College a properly executed certificate(s) of insurance which evidence all insurance required by Exhibit B. Said certificate(s) of insurance shall be attached herein as Exhibit C.

6. Assignment. Contractor may not assign or subcontract this Agreement or its performance thereof, in whole or in part, without the College's prior written consent.

7. Entire Agreement; Modification. This Agreement, together with the Exhibits and other documents referenced and incorporated herein, sets forth the entire agreement of the parties on the subject matter hereof and supersedes all previous or concurrent agreements between them, whether oral or written. Any proposal, quotation, acknowledgment, confirmation or other writing submitted by Contractor to the College shall not be deemed to amend or modify this Agreement, and will be of no legal effect except to the extent that it serves to identify the work and services to be performed by the Contractor. This Agreement, and the terms set forth in the Master Terms, will control over any conflicting terms or provisions contained in any proposal, invoice or other documentation submitted by Contractor to College. The terms of this Agreement may not be modified or changed except by a writing that both parties sign. This Agreement shall inure to the benefit of the College and Contractor and the College's successors and assigns.

IN WITNESS WHEREOF, the parties have executed this Agreement as of the day and year first above written.

AWARDEE ONLY – COMPANY NAME	**COMMUNITY COLLEGE OF ALLEGHENY COUNTY**
By: _____	By: James Flynn
Signature: _____	Signature: _____
Title: _____	Title: Vice President for Finance
Date: _____	Date: _____

Revised 3/3/15

EXHIBITS - The following Exhibits are attached hereto and made a part of this Agreement for all purposes:

- ☐ **Exhibit A - Contractor's Proposal Response**
- ☐ **Exhibit B - Insurance Requirements**
- ☐ **Exhibit C - Contractor's Certificate(s) of Insurance.**
- ☐ **Exhibit D – Performance and Payment Bonds**
- ☐ **Exhibit E – No-Lien Agreement**

COMMUNITY COLLEGE OF ALLEGHENY COUNTY
800 ALLEGHENY AVENUE, PITTSBURGH, PA 15233

NO-LIEN AGREEMENT

"TO BE COMPLETED ONLY BY AWARDEE"
Bid 1139

Made the _____day of_____, 20_____between_____

_____Pittsburgh, Pennsylvania Contractor and Community College of Allegheny County, Pittsburgh, Pennsylvania, Owner.

Whereas, by separate written contract dated and executed the day and year first above written. The Owner and Contractor have entered into a No-Lien Contract (herein described for convenience as the Contract) to furnish all labor, materials, supplies, tools, and equipment necessary to complete the Contract in accordance with the specifications prepared by the Owner, and the provisions on the Contract between the Owner and Contractor, as more particularly recited therein.

NOW, THEREFORE, in consideration of the execution of said Contract for the purchases of and delivery on the premises of the owner and terms and conditions thereof, the Contractor covenants and agrees as follows:

1. The contractor covenants and agrees that no mechanics' claims or liens shall be entered or filed by the Contractor or by any subcontractor or materialsman or by an other person against the building or property of the Owner described more particularly hereinafter, for or on account of any work or labor done, materials, supplies, tools and equipment furnished in, upon, or about the building and property of the Owner described more particularly hereinafter.

2. Any and all right of lien is hereby waived and the Contractor, all subcontractors, all materialsmen, all persons supplying labor, and/or materials and all other persons shall look exclusively to and hold the Contractor and not the property liable for any sums due, however arising.

3. The property as to which this No-Lien Agreement is filed is located at Community College of Allegheny County, _____.

Block/Lot_____

IN WITNESS WHEREOF, the parties hereto, with the intent to be bound legally thereby have duly executed this No-Lien Agreement the day and year first above written.

COMMUNITY COLLEGE OF ALLEGHENY COUNTY (OWNER)

_____
CCAC - VICE PRESIDENT FOR FINANCE (revised 3/16/15)

_____ _____
(CONTRACTOR) WITNESS

COMMUNITY COLLEGE OF ALLEGHENY COUNTY

800 ALLEGHENY AVENUE PITTSBURGH, PA 15233

INSURANCE REQUIREMENTS

FORM B

Indemnification. To the fullest extent permitted by law, Contractor shall defend, indemnify and hold harmless the Community College of Allegheny County (CCAC), its agents, officers, employees, and volunteers from and against all claims, damages, losses, and expenses (including but not limited to attorney fees and court costs) arising from the acts, errors, mistakes, omissions, work or service of Contractor, its agents, employees, or any tier of its subcontractors in the performance of this Contract. The amount and type of insurance coverage requirements of this Contract will in no way be construed as limiting the scope of indemnification in this Paragraph.

Insurance. Contractor shall maintain during the term of this Contract insurance policies described below issued by companies licensed in Pennsylvania with a current A.M. Best rating of A- or better. At the signing of this Contract, and prior to the commencement of any work, Contractor shall furnish the CCAC Purchasing Department with a **Certificate of Insurance** evidencing the required coverages, conditions, and limits required by this Contract at the following address: Community College of Allegheny County, Purchasing Department, 800 Allegheny Avenue, Pittsburgh, PA 15233.

The insurance policies, except Workers' Compensation and Professional Liability, shall be endorsed to name Community College of Allegheny County, its agents, officers, employees, and volunteers as Additional Insureds with the following language or its equivalent:

> Community College of Allegheny County, its agents, officers, employees, and volunteers are hereby named as additional insureds as their interest may appear.

All such Certificates shall provide a 30-day notice of cancellation. Renewal Certificates must be provided for any policies that expire during the term of this Contract. Certificate must specify whether coverage is written on an Occurrence or a Claims Made Policy form.

Insurance coverage required under this Contract is:

1) **Commercial General Liability** insurance with a limit of not less than $1,000,000 per occurrence for bodily injury, property damage, personal injury, products and completed operations, and blanket contractual coverage, including but not limited to the liability assumed under the indemnification provisions of this Contract.
2) **Automobile Liability** insurance with a combined single limit for bodily injury and property damage of not less than $1,000,000 each occurrence with respect to Contractor's owned, hired, and non-owned vehicles.
3) **Workers' Compensation** insurance with limits statutorily required by any Federal or State law and **Employer's Liability** insurance of not less than $100,000 for each accident, $100,000 disease for each employee, and $500,000 disease policy limit.
4) **Professional Liability** insurance (where applicable) covering acts, errors, mistakes, and omissions arising out of the work or services performed by the Contractor, or any person employed by the Contractor, with a limit of not less than $1,000,000 each claim.

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END OF TABLE OF CONTENTS

3/25/2025

ARCHITECTURE SEAL

ELECTRICAL SEAL

END OF SEAL PAGE

SECTION 024119 - SELECTIVE DEMOLITION

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.2 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items 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, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.3 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. 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.

1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.4 PREINSTALLATION MEETINGS

A. Predemolition Conference: Conduct conference at Project site.

1. Inspect and discuss condition of construction to be selectively demolished.
2. Review structural load limitations of existing structure.

3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
5. Review areas where existing construction is to remain and requires protection.

1.5 INFORMATIONAL SUBMITTALS

A. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, and for dust control. Indicate proposed locations and construction of barriers.

B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by salvage and demolition operations. Comply with Section 013233 "Photographic Documentation." Submit before Work begins.

C. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.6 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.7 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

1. Before selective demolition, Owner will remove the following items:

    a. Coordinate with Owner on any Owner work items.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: It is not expected that hazardous materials will be encountered in the Work.

1. If suspected hazardous materials are encountered, do not disturb; immediately notify Architect and Owner. Hazardous materials will be removed by Owner under a separate contract.

E. Historic Areas: Demolition and hauling equipment and other materials shall be of sizes that clear surfaces within historic spaces, areas, rooms, and openings, including temporary protection, by 12 inches or more.

F. Storage or sale of removed items or materials on-site is not permitted.

G. Utility Service: Maintain existing utilities in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.8 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:

B. Notify warrantor on completion of selective demolition and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.9 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ANSI/ASSP A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

D. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs or video.

1. Inventory and record the condition of items to be removed and salvaged.
2. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.2 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.
2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

    a. Equipment to Be Removed: Disconnect and cap services and remove equipment.
    b. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
    c. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

3.3 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

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.

B. Remove temporary barricades and protections where hazards no longer exist.

3.4 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. 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. Temporarily cover openings to remain.
3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
5. Maintain fire watch during and for at least 8 hours after flame-cutting operations.
6. Maintain adequate ventilation when using cutting torches.
7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
10. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Work in Historic Areas: Selective demolition may be performed only in areas of Project that are not designated as historic. In historic spaces, areas, and rooms, or on historic surfaces, the terms "demolish" or "remove" shall mean historic "removal" or "dismantling".

D. Removed and Salvaged Items:

1. Clean salvaged items.
2. Pack or crate items after cleaning. Identify contents of containers.
3. Store items in a secure area until delivery to Owner.
4. Transport items to Owner's storage area **designated by Owner**.
5. Protect items from damage during transport and storage.

E. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.
2. Pack or crate items after cleaning and repairing. Identify contents of containers.
3. Protect items from damage during transport and storage.
4. Reinstall 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.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition **and cleaned** and reinstalled in their original locations after selective demolition operations are complete.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. 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.

B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings."

3.6 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and, where possible recycle them or if recycling is not possible, dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.7 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION

SECTION 078413 -PENETRATION FIRESTOPPING

PART 1 - GENERAL

1.1 SUMMARY

A. This section includes through-penetration firestop systems for penetrations through the following fire-resistance rated assemblies, including both empty openings and openings containing penetration items:

1. Floors/Ceiling (as applicable for shaft protection only).
2. Walls and Partitions.
3. Smoke Barriers.

1.2 RELATED DOCUMENTS

A. Contract Drawings and general provisions of the contract, including Special Conditions, and Division 1 Specification Section apply to this Section.

1.3 DEFINITIONS

A. Agencies, and the abbreviations used to reference them, including the following:

1. ASTM – American Standards for Testing Materials.

1.4 PERFORMANCE REQUREMENTS

A. General: For penetrations through fire-resistance-rated constructions, including both empty openings and openings containing penetrating items, provide through-penetration firestop systems that are produced and installed to resist spread of fire according to requirements indicated, resist passage of smoke and other gases, and maintain original fire-resistance rating of construction penetrated.

1. Fire-resistance-rated load-bearing walls, including partitions, with fire-protection-rated openings.
2. Fire-resistance-rated non-load-bearing walls, including partitions, with fire-protection-rated openings.
3. Fire-resistance-rated floor/ceiling assemblies.
4. Fire-resistance-rated roof/ceiling assemblies.
5. Not all may be applicable, refer to drawings for location of rated assemblies.

B. Rated Systems: Provide through penetration firestop systems with the following ratings determined by UL1479.

1. F-Rated Systems: Provide through-penetration firestop systems with F-ratings indicated, but not less than that equaling or exceeding fire-resistance rating of construction penetrated.
2. T-Rated Systems: For the following conditions, provide through- penetration firestop systems with T-ratings indicated, as well as F-ratings, where systems protect penetrating items exposed to potential contact with adjacent materials in occupied floor areas:

    a. Penetrations located outside wall cavities.
    b. Penetrations located outside fire-resistance-rated shaft enclosures.

3. L-Rated Systems: Provide through-penetration firestop systems with L-ratings of not more than 3.0 cfm/sq. ft. at both ambient temperatures and 400 degrees F.

C. For through-penetration firestop systems exposed to view, traffic, moisture, and physical damage, provide products that, after curing, do not deteriorate when exposed to these conditions both during and after construction.

1. For piping penetrations for plumbing and wet-pipe sprinkler systems, provide moisture-resistant through-penetration firestop systems.
2. For floor penetrations with annular spaces exceeding 4 inches in width and exposed to possible loading and traffic, provide firestop systems capable of supporting floor loads involved, either by installing floor plates or other means.
3. For penetrations involving insulating piping, provide through-penetration firestop systems not requiring removal of insulation.

D. For floor-penetration firestop systems exposed to view, provide products with flame-spread and smoke-developed indexes of less than 25 and 50, respectively, as determined by ASTM E84.

1.5 SUBMITTALS

A. Product Data: For each through-penetration firestop system product indicated.

B. System Drawings: Submit documentation from UL or other qualified testing and inspection agency that is applicable to each perimeter or penetration fire containment system configuration for construction and linear void width.

C. Product Certificates: Certificate of conformance signed by manufacturers of perimeter and penetration fire containment system products certifying that products comply with requirements.

1.6 QUALITY ASSURANCE

A. Provide perimeter fire containment systems that comply with the following requirements and those specified in “Performance Criteria” Article:

1. Fire stopping tests are performed by a qualified, testing and inspection agency. A qualified testing and inspection agency is UL, or another agency performing testing and follow-up inspection services for perimeter fire containment systems acceptable to authorities having jurisdiction.

2. Perimeter fire containment system products bear classification marking of qualified testing and inspection agency.

B. Engage an experienced installer who is certified, licensed, FM Approved in accordance with FM 4991, Certified by UL as a Qualified Contractor, or otherwise qualified by the fire stopping manufacturer as having been provided the necessary training to install firestop products per specified requirements. A manufacturer's willingness to sell its fire stopping products to Contractor or to an installer engaged by Contractor does not in itself confer qualifications on buyer.

C. Obtain each type of through-penetration firestopping system through one (1) source from a single manufacturer.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Products: Subject to compliance with requirements, provide (1) one of the through-penetration firestop systems indicated for each application that are produced by one of the following manufacturers:

1. Hilti
2. 3M; Fire Protection Products Division.
3. Grace, W.R. & Company – Conn.
4. Johns Manville.
5. Tremco: Sealant/Weatherproofing Division.
6. USG Corporation.

2.2 FIRESTOPPING

A. Compatibility: Provide through-penetration firestop systems that are compatible with one another; with the substrates forming openings; and with the items, if any, penetrating through-penetration firestop systems, under conditions of service and application, as demonstrated by through-penetration firestop system manufacturer based on testing and field experience.

B. Accessories: Provide components for each through-penetration firestop system that are needed to install fill materials and to comply with Part 1 "Performance Requirements" Article. Use only components specified by through-penetration firestop system manufacturer and approved qualified testing and inspecting agency for firestop systems indicated.

PART 3 – EXECUTION

3.1 EXAMINATION

A. The Installer shall examine substrates and conditions for compliance with requirements for opening configurations, penetration items, substrates, and other conditions affecting performance.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Surface cleaning: Clean out openings immediately before installing through-penetration firestop systems to comply with written recommendations of firestop system manufacturer and the following requirements:

1. Remove from surfaces of opening substrates and from penetrating items foreign materials that could interfere with adhesion of through-penetration firestop systems.

2. Clean opening substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with through-penetration firestop systems. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form-release agents from concrete.

B. Priming: Prime substrates where recommended in writing by through-penetration firestop system manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent through-penetration firestop systems from contacting adjoining surfaces that will remain exposed on completion of the Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestop system materials. Remove tape as soon as possible without disturbing firestop system's seal with substrates.

3.3 THROUGH-PENETRATION FIRESTOP SYSTEM INSTALLATION

A. General Requirements: Install through-penetration firestop systems to comply with Part 1 "Performance Requirements" Article and with firestop system manufacturer's written installation instructions and published Contract Drawings for products and applications indicated.

B. Install forming/damming/backing materials and other accessories of types required to support fill materials during their application and in the position needed to produce cross-sectional shapes and depths required to achieve fire ratings indicated.

1. After installing fill materials and allowing them to fully cure, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for firestop systems by proven techniques to produce the following results:

1. Fill voids and cavities formed by openings, forming materials, accessories, and penetrating items as required to achieve fire-resistance ratings indicated.
2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.
3. For fill materials that will remain exposed after completing the Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

D. Identification: Identify through-penetration firestop systems with preprinted metal or plastic label. Attach labels permanently to surfaces adjacent to and within 6 inches of edge of the firestop systems so that the labels will be visible to anyone seeking to remove penetrating items or firestop systems. Use mechanical fasteners for metal labels. Include the following information on labels:

1. The words "Warning –Through-Penetration Firestop System – Do Not Disturb. Notify Building Management of Any Damage."
2. Installer's name, address, and phone number.
3. Through-penetration firestop system designation of applicable testing and inspection agency.
4. Date of installation.
5. Through-penetration firestop system manufacturer's name.
6. Installer's name.

3.4 FIELD QUALITY CONTROL

A. Where deficiencies are found, repair or replace through-penetration firestop systems so they comply with requirements.

B. Proceed with enclosing through-penetration firestop systems with other construction only after inspection.

3.5 CLEANING AND PROTECTION

A. Clean off excess fill materials adjacent to openings as the Work progresses by methods and with cleaning materials that are approved by through-penetration firestop system manufacturers and that do not damage materials in which openings occur.

B. Provide final protection and maintain conditions during and after installation through-penetration firestop systems are without damage or deterioration at a time of acceptance of complete Project by Owner. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated through-penetration firestop systems immediately and install new materials to produce through-penetration firestop systems complying with specified materials.

END OF SECTION

SECTION 079200 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Silicone joint sealants.
2. Nonstaining silicone joint sealants.
3. Urethane joint sealants.
4. Immersible joint sealants.
5. Silane-modified polymer joint sealants.
6. Mildew-resistant joint sealants.
7. Polysulfide joint sealants.
8. Butyl joint sealants.
9. Latex joint sealants.

1.2 ACTION SUBMITTALS

A. Product Data:

1. All Joint Sealants.

B. Samples: Manufacturer's standard color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.

1.3 INFORMATIONAL SUBMITTALS

A. Preconstruction Laboratory Test Schedule: Include the following information for each joint sealant and substrate material to be tested:

1. Joint-sealant location and designation.
2. Manufacturer and product name.
3. Type of substrate material.
4. Number of samples required.

B. Preconstruction Field-Adhesion-Test Reports: Indicate which sealants and joint preparation methods resulted in optimum adhesion to joint substrates based on testing specified in "Preconstruction Testing" Article.

C. Field Quality-Control Reports: For field-adhesion-test reports, for each sealant application tested.

D. Sample warranties.

1.4 CLOSEOUT SUBMITTALS

A. Manufacturers' special warranties.

B. Installer's special warranties.

1.5 QUALITY ASSURANCE

A. Installer Qualifications: Authorized representative who is trained and approved by manufacturer.

B. Testing Agency Qualifications: Qualified in accordance with ASTM C1021 to conduct the testing indicated.

1.6 PRECONSTRUCTION TESTING

A. Preconstruction Field-Adhesion Testing: Before installing sealants, field test their adhesion to Project joint substrates as follows:

1. Locate test joints where indicated on Project or, if not indicated, as directed by Architect.
2. Conduct field tests for each kind of sealant and joint substrate.
3. Notify Architect seven days in advance of dates and times when test joints will be erected.
4. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.

    a. For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

5. Report whether sealant failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. For sealants that fail adhesively, retest until satisfactory adhesion is obtained.
6. Evaluation of Preconstruction Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing, in absence of other indications of noncompliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrates during testing.

1.7 FIELD 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. Where contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.8 WARRANTY

A. Special Installer's Warranty: Installer agrees to repair or replace joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: **Two** years from date of Substantial Completion.

B. Special Manufacturer's Warranty: Manufacturer agrees to furnish joint sealants to repair or replace those joint sealants that do not comply with performance and other requirements specified in this Section within specified warranty period.

1. Warranty Period: **Five** years from date of Substantial Completion.

C. Special warranties specified in this article exclude deterioration or failure of joint sealants from the following:

1. Movement of the structure caused by stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression.
2. Disintegration of joint substrates from causes exceeding design specifications.
3. Mechanical damage caused by individuals, tools, or other outside agents.
4. Changes in sealant appearance caused by accumulation of dirt or other atmospheric contaminants.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain joint sealants from single manufacturer **for each sealant type**.

2.2 JOINT SEALANTS, 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 joint-sealant manufacturer, based on testing and field experience.

B. Colors of Exposed Joint Sealants: Match Existing per location or As selected by Architect from manufacturer's full range.

C. Note: The following sealants are a generic range of multiple different options, meant to cover a varying range of locations and substrates. The General Contractor shall select the most appropriate sealant for each specific location and indicate their selection in the provided sealant schedule, along with the product data, for the Architect’s review.

2.3 SILICONE JOINT SEALANTS

A. Silicone, S, NS, 100/50, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

B. Silicone, S, NS, 50, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

C. Silicone, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.

D. Silicone, S, NS, 50, T, NT: Single-component, nonsag, plus 50 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Uses T and NT.

2.4 NONSTAINING SILICONE JOINT SEALANTS

A. Nonstaining Joint Sealants: No staining of substrates when tested in accordance with ASTM C1248.

B. Silicone, Nonstaining, S, NS, 100/50, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Use NT.

C. Silicone, Nonstaining, S, NS, 50, NT: Nonstaining, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

D. Silicone, Nonstaining, S, NS, 100/50, T, NT: Nonstaining, single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.

E. Silicone, Nonstaining, M, NS, 50, NT: Nonstaining, multicomponent, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant; ASTM C920, Type M, Grade NS, Class 50, Use NT.

2.5 URETHANE JOINT SEALANTS

A. Urethane, S, NS, 100/50, T, NT: Single-component, nonsag, plus 100 percent and minus 50 percent movement capability, traffic- and nontraffic-use, urethane joint sealant; ASTM C920, Type S, Grade NS, Class 100/50, Uses T and NT.

2.6 MILDEW-RESISTANT JOINT SEALANTS

A. Mildew-Resistant Joint Sealants: Formulated for prolonged exposure to humidity with fungicide to prevent mold and mildew growth.

B. Silane-Modified Polymer, Mildew Resistant, S, NS, 50, NT: Mildew-resistant, single-component, nonsag, plus 50 percent and minus 50 percent movement capability, nontraffic-use, joint sealant; ASTM C920, Type S, Grade NS, Class 50, Use NT.

2.7 BUTYL JOINT SEALANTS

A. Butyl-Rubber-Based Joint Sealants: ASTM C1311.

2.8 LATEX JOINT SEALANTS

A. Acrylic Latex: Acrylic latex or siliconized acrylic latex, ASTM C834, Type OP, Grade NF.

2.9 JOINT-SEALANT BACKING

A. Sealant Backing Material, General: Nonstaining; compatible with joint substrates, sealants, primers, and other joint fillers; and approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

B. Cylindrical Sealant Backings: ASTM C1330, Type C (closed-cell material with a surface skin), Type O (open-cell material), Type B (bicellular material with a surface skin) or any of the preceding types, as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

C. Bond-Breaker Tape: Polyethylene tape or other plastic tape recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint-filler materials or joint surfaces at back of joint. Provide self-adhesive tape where applicable.

2.10 MISCELLANEOUS MATERIALS

A. Primer: Material recommended by joint-sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint-sealant-substrate tests and field tests.

B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming joint substrates and adjacent nonporous surfaces in any way, and formulated to promote optimum adhesion of sealants to joint substrates.

C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting 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 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, 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.
    d. Stucco or Exterior insulation and finish systems.

3. Remove laitance and form-release agents from concrete.
4. Clean nonporous joint substrate surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:

    a. Metal.
    b. Glass.
    c. Porcelain enamel.
    d. Glazed surfaces of ceramic tile.

B. Joint Priming: Prime joint substrates where recommended by joint-sealant manufacturer or as indicated by 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 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 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 C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.

C. Install sealant backings of type indicated to support sealants during application and at position required to produce cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.

1. Do not leave gaps between ends of sealant backings.
2. Do not stretch, twist, puncture, or tear sealant backings.
3. Remove absorbent sealant backings that have become wet before sealant application, and replace them with dry materials.

D. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.

E. Install sealants using proven techniques that comply with the following and at the same time backings are installed:

1. Place sealants so they directly contact and fully wet joint substrates.
2. Completely fill recesses in each joint configuration.
3. Produce uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability.

F. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants in accordance with requirements specified in subparagraphs below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.

1. Remove excess sealant from surfaces adjacent to joints.
2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.

3. Provide concave joint profile in accordance with Figure 8A in ASTM C1193 unless otherwise indicated. Use masking tape to protect surfaces adjacent to recessed tooled joints.

3.4 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Field-Adhesion Testing: Field test joint-sealant adhesion to joint substrates as follows:

    a. Extent of Testing: Test completed and cured sealant joints as follows:

        1) Perform 1 test for each kind of sealant and joint substrate.

    b. Test Method: Test joint sealants in accordance with Method A, Tail Procedure, in ASTM C1521.

        1) For joints with dissimilar substrates, verify adhesion to each substrate separately; extend cut along one side, verifying adhesion to opposite side. Repeat procedure for opposite side.

    c. Inspect tested joints and report on the following:

        1) Whether sealants filled joint cavities and are free of voids.
        2) Whether sealant dimensions and configurations comply with specified requirements.
        3) Whether sealants in joints connected to pulled-out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each kind of product and joint substrate. Compare these results to determine if adhesion complies with sealant manufacturer's field-adhesion hand-pull test criteria.

    d. Record test results in a field-adhesion-test log. Include dates when sealants were installed, names of persons who installed sealants, test dates, test locations, whether joints were primed, adhesion results and percent elongations, sealant material, sealant configuration, and sealant dimensions.
    e. Repair sealants pulled from test area by applying new sealants following same procedures used originally to seal joints. Ensure that original sealant surfaces are clean and that new sealant contacts original sealant.

2. Evaluation of Field-Adhesion-Test Results: Sealants not evidencing adhesive failure from testing or noncompliance with other indicated requirements will be considered satisfactory. Remove sealants that fail to adhere to joint substrates during testing or to comply with other requirements. Retest failed applications until test results prove sealants comply with indicated requirements.

B. Prepare test and inspection reports.

3.5 CLEANING

A. Clean off excess sealant or sealant smears adjacent to joints as the Work progresses by methods and with cleaning materials approved in writing by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

A. Protect joint sealants during and after curing period from contact with contaminating substances and from damage resulting from construction operations or other causes so sealants are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out, remove, and repair damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

END OF SECTION

SECTION 080314 - HISTORIC TREATMENT OF WOOD DOORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Historic treatment of wood doors in the form of the following:

a. Repairing wood doors and trim.
b. Replacing wood door units and trim with custom-fabricated replicated units.
c. Reglazing.
d. Repairing, refinishing, and replacing hardware.

1.2 ALLOWANCES

A. See Section 012100 "Allowances" for description of allowances for historic treatment of wood doors.

1. Perform historic treatment of wood doors under quantity allowances and only as authorized. Authorized work includes work required by Drawings and the Specifications and work as directed in writing by Architect.
2. Notify Architect weekly of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Repair wood doors as part of Repair allowance.

1.3 DEFINITIONS

A. Door: Generally, this term includes door frame, leaves, hardware, side panels or lights, fan light, transom, storm and screen doors, and storm vestibule unless otherwise indicated by context.

B. Glazing: Includes glass, glazing points, glazing tapes, glazing sealants, and glazing compounds.

C. Wood Door Component Terminology: Wood door components for historic treatment work include the following classifications:

1. Frame Components: Head, jambs, stop, and threshold or sill.
2. Leaf Components: Stiles, rails, and muntins.
3. Exterior Trim: Exterior casing, brick mold, and cornice or drip cap.
4. Interior Trim: Casing.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Historic Treatment Conference that pertain to historic treatment of wood doors.
2. Review methods and procedures related to historic treatment of wood doors including, but not limited to, the following:

    a. Historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
    b. Materials, material application, sequencing, tolerances, and required clearances.
    c. Fire-protection plan.
    d. Wood door historic treatment program.
    e. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

A. Perform historic treatment of wood doors in the following sequence, which includes Work specified in this and other Sections:

1. Label each door frame with permanent opening-identification number in inconspicuous location.
2. Tag existing door leaves, storm doors, storm-vestibule panels, and screen doors with opening-identification numbers and remove for on-site or off-site repair. Indicate on tags the locations of each component, such as "left-hand door leaf," "right-hand reverse door leaf," "top dutch-door leaf," "bottom dutch-door leaf," "first left-side storm-vestibule panel," and "second left-side storm-vestibule panel."
3. Remove door, dismantle hardware, and tag hardware with door opening-identification numbers.
4. In the shop, label each leaf, storm door, storm-vestibule panel, and screen door with permanent opening-identification number in inconspicuous location and remove site-applied tags.
5. Install temporary protection and security at door openings.
6. Sort units by condition, separating those that need extensive repair.
7. Clean surfaces.
8. General Wood-Repair Sequence:

    a. Remove paint to bare wood.
    b. Rack frames slightly to inject adhesive into mortise and tenon joints; square frames to proper fit before adhesive sets.
    c. If glass thicker than original is required, rout existing muntins to required rebate size.
    d. Repair wood by consolidation, member replacement, partial member replacement, and patching.
    e. Sand, prime, fill, sand again, and prime surfaces again for refinishing.

9. Repair, refinish, and replace hardware if required. Reinstall operating hardware.
10. Install glazing.
11. Remove temporary protection and security at door openings.

12. Reinstall units.
13. Apply finish coats.
14. Install remaining hardware and weather stripping.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for product application and use. Include test data substantiating that products comply with requirements.

B. Samples for Initial Selection: For each type of exposed wood and finish.

1. Identify wood species, cut, and other features.
2. Include Samples of hardware and accessories involving color selection.

C. Samples for Verification: Actual sample of finished products for the following, in manufacturer's standard sizes unless otherwise indicated:

1. Replacement Units: 12-inch long, full-size frame, leaf, exterior trim, interior trim sections with applied finish.

1.7 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications: A qualified historic wood door specialist, experienced in repairing, refinishing, and replacing wood doors in whole and in part. Experience only in fabricating and installing new wood doors is insufficient experience for wood-door historic treatment work.

B. Wood-Repair-Material Manufacturer Qualifications: A firm regularly engaged in producing wood consolidant and wood-patching compound that have been used for similar historic wood-treatment applications with successful results, and with factory-authorized service representatives who are available for consultation and Project-site inspection and on-site assistance.

C. Wood Door Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for historic treatment work, including protection of surrounding materials and Project site.

1. If materials and methods other than those indicated are proposed for any phase of historic treatment work, add a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Pack, deliver, and store products in suitable packs, heavy-duty cartons, or wooden crates; surround with sufficient packing material to ensure that products will not be deformed, broken, or otherwise damaged.

B. Store products inside a well-ventilated area, protected from weather, moisture, soiling, abrasion, extreme temperatures, and humidity, and where environmental conditions comply with manufacturer's requirements.

1.9 FIELD CONDITIONS

A. Weather Limitations: Proceed with historic treatment of wood doors only when existing and forecasted weather conditions are within environmental limits set by each manufacturer's written instructions and specified requirements.

PART 2 - PRODUCTS

2.1 HISTORIC TREATMENT OF WOOD DOORS QUALITY STANDARD

A. Quality Standard: Comply with applicable requirements in Section 12, "Historic Restoration Work," and related requirements in AWMAC/WI's "North American Architectural Woodwork Standards" for construction, finishes, grades of wood doors, and other requirements unless otherwise indicated.

1. Exception: Industry practices cited in Section 12, Paragraph 6, "Industry Practices," under Article 12.1, "Basic Considerations," of AWMAC/WI's "North American Architectural Woodwork Standards" do not apply to the Work of this Section.

2.2 REPLACEMENT WOOD DOOR UNITS

A. Replacement Wood Door Units: Custom-fabricated, replicated wood door units and trim with operating and latching hardware.

1. Wood Door Components: Replace frame, leaf, and trim.
2. Joint Construction: Joints matching existing.
3. Wood Species: Match wood species of existing door components.
4. Wood Cut: Match cut of existing wood door components.
5. Wood Member and Trim Profiles: Match profiles and detail of existing door members and trim.
6. Hardware: As indicated on Drawings.
7. Hardware Set: As indicated on Drawings / Specifications.
8. Glazing Stops: Provide replacement glazing stops coordinated with glazing system indicated.
9. Weather Stripping: Full-perimeter weather stripping for each exterior door leaf.

2.3 WOOD-REPLACEMENT MATERIALS

A. Wood, General: Clear fine-grained lumber; kiln dried to a moisture content of 6 to 12 percent at time of fabrication; free of visible finger joints, blue stain, knots, pitch pockets, and surface checks larger than 1/32 inch deep by 2 inches wide.

1. Species: Match species of each existing type of wood component or assembly unless otherwise indicated.

B. Frame Heads and Jambs and Exterior Trim: Match existing species.

C. Thresholds or Sills: Match existing species.

D. Leaf Components: Match existing species.

E. Interior Trim: Match existing species.

2.4 WOOD-REPAIR MATERIALS

A. Source Limitations: Obtain wood consolidant and wood-patching compound from single source from single manufacturer.

B. Wood Consolidant: Ready-to-use product designed to penetrate, consolidate, and strengthen soft fibers of wood materials that have deteriorated because of weathering and decay and designed specifically to enhance the bond of wood-patching compound to existing wood.

C. Wood-Patching Compound: Two-part, epoxy-resin, wood-patching compound; knife-grade formulation as recommended in writing by manufacturer for type of wood repair indicated, tooling time required for the detail of work, and site conditions. Compound to be designed for filling voids in damaged wood materials that have deteriorated because of weathering and decay. Compound to be capable of filling deep holes and spreading to feather edge.

2.5 GLAZING MATERIALS

A. Glass:

1. Safety glass units in accordance with IBC and IECC requirements. Coordinate with Architect. Tint shall match existing.

B. Glazing Systems:

1. Traditional Glazing Products: Glazing points and oil-based glazing putty or latex glazing compound. Tint to required color in accordance with manufacturer's written instructions.
2. Modern Glazing Products: Glazing points and single-component polyurethane glazing compound; ASTM C920, Type S, Grade NS, Class 25, Use G; struck uniformly to match taper of existing glazing putty (removed); colored as required to match painted sash.
3. Primers and Cleaners for Glazing: As recommended in writing by glazing material manufacturer.

2.6 HARDWARE

A. Primary Door Hardware, General: Provide complete sets of door hardware consisting of hinges, pulls, locks, latches, and accessories indicated for each door or required for proper operation. Sets to include replacement hardware to complement repaired and refinished, existing hardware. Door hardware to smoothly operate, tightly close, and securely lock wood doors and be sized to accommodate frequency of use, glazing weight, and dimensions. Refer to Door Hardware Specifications and Drawings for additional information.

2.7 MISCELLANEOUS MATERIALS

A. Cleaning Materials:

1. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate, 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for each 5 gal. of solution required.
2. Mildewcide: Commercial, proprietary mildewcide or a solution prepared by mixing 1/3 cup of household detergent that contains no ammonia, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.

B. Adhesives: Wood adhesives with minimum 15- to 45-minute cure at 70 deg F, in gunnable and liquid formulations as recommended in writing by adhesive manufacturer for each type of repair and exposure conditions.

C. Fasteners: Use fastener metals that are noncorrosive and compatible with each material joined.

1. Match existing fasteners in material and type of fastener unless otherwise indicated.
2. Use concealed fasteners for interconnecting wood components.
3. Use concealed fasteners for attaching items to other work unless exposed fasteners are unavoidable or the existing fastening method.
4. For fastening metals, use fasteners of same basic metal as fastened metal unless otherwise indicated.
5. For exposed fasteners, use Phillips-type machine screws of head profile flush with metal surface unless otherwise indicated.
6. Finish exposed fasteners to match finish of metal fastened unless otherwise indicated.

D. Anchors, Clips, and Accessories: Fabricate anchors, clips, and door accessories of aluminum, nonmagnetic stainless steel, or hot-dip zinc-coated steel complying with requirements in ASTM B633 for SC 3 (Severe) service condition.

2.8 WOOD DOOR FINISHES

A. Unfinished Replacement Units: Provide exposed exterior and interior wood surfaces of replacement units unfinished; smooth, filled, and suitably prepared for on-site priming and finishing or shop finish as preferred or applicable.

PART 3 - EXECUTION

3.1 PREPARATION

A. Protect adjacent materials from damage by historic treatment of wood doors.

B. Clean wood doors and trim of mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. Scrub mildewed areas with mildewcide. After cleaning, rinse thoroughly with fresh water. Allow to dry before repairing or painting.

C. Condition replacement wood members and replacement units to prevailing conditions at installation areas before installing.

3.2 HISTORIC TREATMENT OF WOOD DOORS, GENERAL

A. Historic Treatment Appearance Standard: Completed work is to have a uniform appearance as viewed by Architect from the door interior at 5 ft. away and from the door exterior at 10 ft. away.

B. General: In treating historic items, disturb them as minimally as possible and as follows:

1. Stabilize and repair wood doors to reestablish structural integrity and weather resistance while maintaining the existing form of each item.
2. Remove coatings and apply borate preservative treatment before repair. Remove coatings in accordance with Section 090391 "Historic Treatment of Plain Painting" unless otherwise indicated.
3. Repair items in place where possible.
4. Install temporary protective measures to protect wood door work that is indicated to be completed later.
5. Refinish historic wood doors in accordance with Section 090391 "Historic Treatment of Plain Painting" unless otherwise indicated.

C. Mechanical Abrasion: Where mechanical abrasion is needed for the Work, use only the gentlest mechanical methods, such as scraping and natural-fiber bristle brushing, that will not abrade wood substrate, reducing clarity of detail. Do not use abrasive methods such as sanding, wire brushing, or power tools except as indicated as part of the historic treatment program and as approved by Architect.

D. Repair and Refinish Existing Hardware: Dismantle door hardware; strip paint, repair, and refinish it to match finish Samples; and lubricate moving parts just enough to function smoothly.

E. Repair Wood Doors: Match existing materials and features, retaining as much original material as possible to perform repairs.

1. Unless otherwise indicated, repair wood doors by consolidating, patching, splicing, or otherwise reinforcing wood with new wood matching existing wood or with salvaged, sound, original wood.

2. Where indicated, repair wood doors by limited replacement matching existing material.

F. Replace Wood Units: Where indicated, duplicate and replace units with units made from salvaged, sound, original wood or with new wood matching existing wood. Use surviving prototypes to create patterns for duplicate replacements.

1. Do not use substitute materials unless otherwise indicated.

G. Protection of Openings: Where doors are indicated for removal, cover resultant openings with temporary enclosures so that openings are weathertight during repair period.

H. Identify removed doors, frames, leaves, trim, and members with numbering system corresponding to door locations to ensure reinstallation in same location. Key doors, frames, leaves, trim, and members to Drawings showing location of each removed unit. Permanently label units in a location that will be concealed after reinstallation.

3.3 WOOD DOOR PATCH-TYPE REPAIR

A. General: Patch wood members that exhibit depressions, holes, or similar voids and that have limited amounts of rotted or decayed wood.

1. Remove leaves from door frames before performing patch-type repairs at meeting or sliding surfaces unless otherwise indicated. Reglaze units prior to reinstallation.
2. Verify that surfaces are sufficiently clean and free of paint residue before patching.
3. Treat wood members with wood consolidant before applying patching compound. Coat wood surfaces by brushing, applying multiple coats until wood is saturated and unable to absorb more. Allow treatment to harden before filling void with patching compound.
4. Remove rotted or decayed wood down to sound wood only if necessary.

B. Apply borate preservative treatment to accessible surfaces either before applying wood consolidant or after removing rotted or decayed wood. Apply treatment liberally by brush to joints, edges, and ends; top, sides, and bottom. Allow treatment to dry.

C. Apply wood-patching compound to fill depressions, nicks, cracks, and other voids created by removed or missing wood.

1. Prime patch area with application of wood consolidant or manufacturer's recommended primer.
2. Mix only as much patching compound as can be applied in accordance with manufacturer's written instructions.
3. Apply patching compound in layers as recommended in writing by manufacturer until the void is completely filled.
4. Sand patch surface smooth and flush with adjacent wood, without voids in patch material, and matching contour of wood member.
5. Clean spilled compound from adjacent materials immediately.

3.4 WOOD DOOR MEMBER-REPLACEMENT REPAIR

A. General: Replace parts of or entire wood door members at locations indicated on Drawings or and where damage is too extensive to patch.

1. Remove leaves from door frames before performing member-replacement repairs unless otherwise indicated.
2. Verify that surfaces are sufficiently clean and free of paint residue before repair.
3. Remove broken, rotted, and decayed wood down to sound wood.
4. Custom fabricate new wood to replace missing wood; either replace entire wood member or splice new wood part into existing member.
5. Secure new wood using finger joints, multiple dowels, or splines with adhesive and nailing to ensure maximum structural integrity at each splice. Use only concealed fasteners. Fill nail holes and patch surface to match surrounding sound wood.

B. Apply borate preservative treatment to accessible surfaces after replacements are made. Apply treatment liberally by brush to joints, edges, and ends; top, sides, and bottom.

C. Repair remaining depressions, holes, or similar voids with patch-type repairs.

D. Clean spilled materials from adjacent surfaces immediately.

E. Glazing: Reglaze units before reinstallation.

1. Mill new and rout existing glazed members to accommodate new glass thickness.
2. Provide replacement glazing stops coordinated with glazing system indicated.
3. Provide glazing stops to match contour of door frames.

F. Reinstall units removed for repair into original openings.

G. Weather Stripping: Replace nonfunctioning and install missing weather stripping to ensure full-perimeter weather stripping for each exterior leaf.

3.5 GLAZING

A. Comply with combined written instructions of glass, glazing system, and glazing material manufacturers, unless more stringent requirements are indicated.

B. Remove cracked and damaged glass and glazing materials from openings and prepare surfaces for reglazing.

C. Remove existing glass and glazing where indicated on Drawings and prepare surfaces for reglazing.

D. Remove glass and glazing from openings and prepare surfaces for reglazing.

E. Size glass as required by Project conditions to provide necessary bite on glass, minimum edge and face clearances, with reasonable tolerances.

F. Apply primers to joint surfaces where required for adhesion of glazing system, as determined by preconstruction testing.

G. Install setting bead, side beads, and back bead against stop in glazing rabbets before setting glass.

H. Install glass with proper orientation so that coatings, if any, face exterior or interior as required.

I. Install glazing points.

J. Disposal of Removed Glass: Protect unbroken lites and deliver as salvage to Owner for storage where directed unless otherwise indicated.

3.6 WOOD DOOR UNIT REPLACEMENT

A. General: Replace existing wood door-frame, leaf, and trim units with new custom-fabricated replicated units at locations indicated on Drawings and where damage is too extensive to repair.

B. Apply borate preservative treatment to accessible surfaces before finishing. Apply treatment liberally by brush to joints, edges, and ends; top, sides, and bottom.

C. Mill glazed members to accommodate glass thickness. Glaze units before installation.

D. Install units, hardware, weather stripping, accessories, and other components as indicated on Drawings.

E. Install units level, plumb, square, true to line, without distortion or impeding movement, anchored securely in place to structural support, and in proper relation to wall flashing, trim, and other adjacent construction.

F. Set threshold or sill members in bed of sealant for weathertight construction unless otherwise indicated.

G. Install door units with new anchors into existing openings.

H. Install full-perimeter weather stripping for each operable exterior leaf.

I. Metal Protection: Separate aluminum and other corrodible surfaces from sources of corrosion or electrolytic action at points of contact with other materials.

J. Disposal of Removed Units: Remove from Owner's property and legally dispose of them or, when directed, deliver as salvage to Owner for storage where directed.

3.7 INSTALLATION OF WEATHER STRIPPING

A. Install weather stripping for tight seal of joints as determined by preconstruction testing and demonstrated in mockup.

3.8 ADJUSTING

A. Adjust existing and replacement operating leaves, screens, hardware, weather stripping, and accessories for a tight fit at contact points and weather stripping for smooth operation and weathertight closure. Lubricate hardware and moving parts.

3.9 CLEANING AND PROTECTION

A. Protect door surfaces from contact with contaminating substances resulting from construction operations. Monitor door surfaces adjacent to and below exterior concrete and masonry during construction for presence of dirt, scum, alkaline deposits, stains, or other contaminants. If contaminating substances contact door surfaces, remove contaminants immediately.

B. Clean exposed surfaces immediately after historic treatment of wood doors. Avoid damage to coatings and finishes. Remove excess sealants, glazing and patching materials, dirt, and other substances.

C. Remove and replace glass that has been broken, chipped, cracked, abraded, or damaged during construction period.

END OF SECTION

SECTION 080671 – DOOR HARDWARE SCHEDULE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section references specification sections relating to commercial door hardware for the following:

1. Swinging doors.
2. Sliding Doors.
3. Other doors to the extent indicated.

B. Commercial door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical and access control door hardware.
3. Electromechanical and access control door hardware power supplies, back-ups and surge protection.
4. Automatic operators.
5. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Hardware”.
2. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. State Building Codes, Local Amendments.

E. Standards: Reference Related Sections for requirements regarding compliance with applicable industry standards.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

a. Type, style, function, size, label, hand, and finish of each door hardware item.
b. Manufacturer of each item.
c. Fastenings and other pertinent information.
d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
e. Explanation of abbreviations, symbols, and codes contained in schedule.
f. Mounting locations for door hardware.
g. Door and frame sizes and materials.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Keying Schedule: Prepared under the supervision of the Owner, separate schedule detailing final keying instructions for locksets and cylinders in writing. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner to approve submitted keying schedule prior to the ordering of permanent cylinders.

D. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

E. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Submittals. The manual to include the name, address, and contact information of the manufacturers providing the hardware and their nearest service

representatives. The final copies delivered after completion of the installation test to include "as built" modifications made during installation, checkout, and acceptance.

F. Warranties and Maintenance: Special warranties and maintenance agreements specified in the Related Sections.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.5 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

1.6 MAINTENANCE SERVICE

A. Maintenance Tools and Instructions: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of door hardware.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. Refer to “PART 3 – EXECUTION” for required specification sections.

PART 3 - EXECUTION

3.1 DOOR HARDWARE SETS

A. The door hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a

hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Products listed in the hardware sets shall be supplied by and in accordance with the requirements described in the specification section as noted for each item.

1. Section 08 71 00 – Door Hardware.
2. Section 08 71 13 – Automatic Door Operators.

C. Manufacturer's Abbreviations:

1. MK - McKinney
2. SU - Securiron
3. SA - SARGENT
4. BE - BEST Locks & Closers
5. NO - Norton
6. RO - Rockwood
7. PE - Pemko
8. OT - Other

Hardware Sets
Set: 1.0

Doors: H101

6	Hinge, Full Mortise, Hvy Wt	T4A3386 (NRP)	US32D	MK 087100	
2	Electric Power Transfer	EL-CEPT	630	SU 087100	⚡
1	Mullion	L980S	PC	SA 087100	
1	Rim Exit Device, Storeroom	16 55 56 72 8804 862	US32D	SA 087100	⚡
1	Rim Exit Device, Exit Only	55 8810 EO	US32D	SA 087100	⚡
1	Mullion Cylinder Kit	72 980C1	US26D	SA 087100	
3	Keyed Core	By Owner	626	BE 087100	
1	Surface Closer	CPS7500	689	NO 087100	
1	Automatic Opener	6300 Series	689	NO 087113	⚡
2	Kick Plate	K1050 10" H. x CSK BEV	US32D	RO 087100	
2	Astragal	297AS TKSP		PE 087100	
1	Rain Guard	346C TKSP		PE 087100	
1	Mullion Gasketing	5110BL		PE 087100	
1	Gasketing	S773BL x Head and Jambs		PE 087100	
2	Sweep	3452CNB TKSP		PE 087100	
1	Threshold	271A MSES25SS		PE 087100	
2	ElectroLynx Frame Harness	QC-C1500P		MK 087100	⚡
2	ElectroLynx Door Harness	QC-C***P		MK 087100	⚡
1	Wiring Diagram	WD-SYSPK		SA 087100	
1	Card Reader	By Division 28		OT	
2	Door Switch	505		NO 087100	⚡
2	Position Switch	DPS-M-BK		SU 087100	⚡
1	Power Supply	AQD4-8C8R2		SU 087100	⚡

Set: 2.0

Doors: H104

6	Hinge, Full Mortise, Hvy Wt	T4A3386 (NRP)	US32D	MK 087100	
2	Electric Power Transfer	EL-CEPT	630	SU 087100	⚡
1	Mullion	L980S	PC	SA 087100	
1	Rim Exit Device, Storeroom	16 55 56 72 8804 862	US32D	SA 087100	⚡
1	Rim Exit Device, Exit Only	55 8810 EO	US32D	SA 087100	⚡
1	Mullion Cylinder Kit	72 980C1	US26D	SA 087100	
3	Keyed Core	By Owner	626	BE 087100	
2	Surface Closer	CPS7500	689	NO 087100	
2	Kick Plate	K1050 10" H. x CSK BEV	US32D	RO 087100	
2	Astragal	297AS TKSP		PE 087100	
1	Rain Guard	346C TKSP		PE 087100	
1	Mullion Gasketing	5110BL		PE 087100	
1	Gasketing	S773BL x Head and Jambs		PE 087100	
2	Sweep	3452CNB TKSP		PE 087100	
1	Threshold	271A MSES25SS		PE 087100	
2	ElectroLynx Frame Harness	QC-C1500P		MK 087100	⚡
2	ElectroLynx Door Harness	QC-C***P		MK 087100	⚡
1	Wiring Diagram	WD-SYSPK		SA 087100	
1	Card Reader	By Division 28		OT	
2	Position Switch	DPS-M-BK		SU 087100	⚡
1	Power Supply	AQD4-8C8R2		SU 087100	⚡

Notes: Operational Narrative
1. Doors normally closed and secure.
2. Authorized access by card reader retracting exit device latches for predetermined time limit. Exit device latches can be electrically held retracted for open access.
3. Egress free for immediate exit.
4. REX switch in push rail allows authorized exit without alarm condition.
5. Door position switches monitor open/closed status.
6. Exit device latches release (fail secure) in event of power loss. Keyed cylinder override for emergency access.

Set: 3.0

Doors: H102

3 Hinge, Full Mortise, Hvy Wt	T4A3386 (NRP)	US32D	MK 087100	
1 Rim Exit Device, Exit Only	8810 EO	US32D	SA 087100	
1 Surface Closer	CPS7500	689	NO 087100	
1 Kick Plate	K1050 10" H. x CSK BEV	US32D	RO 087100	
1 Rain Guard	346C TKSP		PE 087100	
1 Gasketing	S773BL x Head and Jambs		PE 087100	
1 Sweep	3452CNB TKSP		PE 087100	
1 Threshold	271A MSES25SS		PE 087100	
1 Position Switch	DPS-M-BK		SU 087100	

Notes: Operational Narrative
1. Doors normally closed and secure.
2. Egress only. No outside door trim.
3. Door position switch monitors open/closed status.

Set: 4.0

Doors: H103

1 Position Switch	DPS-M-BK		SU 087100

Notes: All other hardware existing to remain.

END OF SECTION

SECTION 081113 - HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Standard and custom hollow metal doors and frames.
2. Steel sidelight, borrowed lite and transom frames.
3. Louvers installed in hollow metal doors.
4. Light frames and glazing installed in hollow metal doors.

B. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI/SDI A250.8 - Recommended Specifications for Standard Steel Doors and Frames.
2. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames, Frames Anchors and Hardware Reinforcing.
3. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames.
4. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames.
5. ANSI/SDI A250.11 - Recommended Erection Instructions for Steel Frames.
6. ASTM A1008 - Standard Specification for Steel Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.
7. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process.
8. ASTM A924 - Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.
9. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus.
10. ANSI/BHMA A156.115 - Hardware Preparation in Steel Doors and Frames.
11. ANSI/SDI 122 - Installation and Troubleshooting Guide for Standard Steel Doors and Frames.
12. ANSI/NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
13. ANSI/NFPA 105: Standard for the Installation of Smoke Door Assemblies.
14. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
15. UL 10C - Positive Pressure Fire Tests of Door Assemblies.

16. UL 1784 - Standard for Air Leakage Tests of Door Assemblies.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include construction details, material descriptions, core descriptions, hardware reinforcements, profiles, anchors, fire-resistance rating, and finishes.

B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the steel door and frame supplier in order to prepare the doors and frames to receive the finish hardware items.

C. Shop Drawings: Include the following:

1. Elevations of each door design.
2. Details of doors, including vertical and horizontal edge details and metal thicknesses.
3. Frame details for each frame type, including dimensioned profiles and metal thicknesses.
4. Locations of reinforcement and preparations for hardware.
5. Details of anchorages, joints, field splices, and connections.
6. Details of accessories.
7. Details of moldings, removable stops, and glazing.
8. Details of conduit and preparations for power, signal, and control systems.

D. Samples for Verification:

1. Samples are only required by request of the architect and for manufacturers that are not current members of the Steel Door Institute.

1.4 QUALITY ASSURANCE

A. Source Limitations: Obtain hollow metal doors and frames through one source from a single manufacturer wherever possible.

B. Quality Standard: In addition to requirements specified, furnish SDI-Certified manufacturer products that comply with ANSI/SDI A250.8, latest edition, "Recommended Specifications for Standard Steel Doors and Frames".

C. Fire-Rated Door Assemblies: Assemblies complying with NFPA 80 that are listed and labeled by a qualified testing agency, for fire-protection ratings indicated, based on testing at positive pressure according to UL10C (neutral pressure at 40” above sill) or UL 10C.

1. Oversize Fire-Rated Door Assemblies Construction: For units exceeding sizes of tested assemblies, attach construction label certifying doors are built to standard construction requirements for tested and labeled fire rated door assemblies except for size.
2. Temperature-Rise Limit: Where indicated 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 installing hollow metal doors and frames and to verify installation of electrical knockout boxes and conduit at frames with electrified or access control hardware.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project site storage. Do not use non-vented plastic.

B. Deliver welded frames with two removable spreader bars across bottom of frames, tack welded to jambs and mullions.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch high wood blocking. Do not store in a manner that traps excess humidity.

1. Provide minimum 1/4-inch space between each stacked door to permit air circulation. Door and frames to be stacked in a vertical upright position.

1.6 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

1.7 WARRANTY

A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship within specified warranty period.

B. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide steel doors and frames from a SDI Certified manufacturer:

1. CECO Door Products (C).
2. Curries Company (CU).

3. Pioneer Industries (PI).
4. Republic Doors (RP).
5. Steelcraft (S).

2.2 MATERIALS

A. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.

B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

C. Frame Anchors: ASTM A 653/A 653M, Commercial Steel (CS), Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.

2.3 HOLLOW METAL DOORS

A. General: Provide 1-3/4 inch doors of design indicated, not less than thickness indicated; fabricated with smooth surfaces, without visible joints or seams on exposed faces unless otherwise indicated. Comply with ANSI/SDI A250.8 and ANSI/NAAMM HMMA 867.

B. Exterior Doors (Energy Efficient): Face sheets fabricated of commercial quality hot-dipped zinc galvanized steel that complies with ASTM A924 A60. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model, ANSI/SDI A250.4 for physical performance level, and HMMA 867 for door construction.

1. Design: Flush panel or as indicated in Drawings.
2. Core Construction: Foamed in place polyurethane and steel stiffened laminated core with no stiffener face welds, in compliance with HMMA 867 “Laminated Core”.

    a. Provide 22 gauge steel stiffeners at 6 inches on-center internally welded at 5" on-center to integral core assembly, foamed in place polyurethane core chemically bonded to all interior surfaces. No stiffener face welding is permitted.
    b. Thermal properties to rate at a fully operable minimum U-Factor 0.37 and R-Value 2.7, including insulated door, thermal-break frame and threshold.
    c. Kerf Type Frames: Thermal properties to rate at a fully operable minimum U-Factor 0.38 and R-Value 2.6, including insulated door, kerf type frame, and threshold.

3. Level/Model: Level 3 and Physical Performance Level A (Extra Heavy Duty), Minimum 16 gauge (0.053 inch - 1.3-mm) thick steel, Model 2.
4. Vertical Edges: Vertical edges to be mechanically interlocked with hairline seam. Beveled Lock Edge, 1/8 inch in 2 inches (3 mm in 50 mm).
5. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet. Doors with an inverted top channel to include a steel closure channel, screw attached, with the web of the channel flush with the face sheets of the door. Plastic or composite channel fillers are not acceptable.
6. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9".

7. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

C. Interior Doors: Face sheets fabricated of commercial quality cold rolled steel that complies with ASTM A 1008/A 1008M. Provide doors complying with requirements indicated below by referencing ANSI/SDI A250.8 for level and model and ANSI/SDI A250.4 for physical performance level:

1. Design: Flush panel or as indicated in Drawings.

   a. Fire Door Core: As required to provide fire-protection and temperature-rise ratings indicated.

2. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 18 gauge (0.042-inch - 1.0-mm) thick steel, Model 2.
3. Top and Bottom Edges: Reinforce tops and bottoms of doors with a continuous steel channel not less than 16 gauge, extending the full width of the door and welded to the face sheet.
4. Hinge Reinforcement: Minimum 7 gauge (3/16") plate 1-1/4" x 9" or minimum 14 gauge continuous channel with pierced holes, drilled and tapped.
5. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material

D. Manufacturers Basis of Design:

1. Curries Company (CU) - Polystyrene Core - 707 Series.
2. Curries Company (CU) - Energy Efficient - 777 Trio-E Series.

2.4 HOLLOW METAL FRAMES

A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.

B. Thermal Break Frames: Subject to the same compliance standards and requirements as standard hollow metal frames. Tested for thermal performance in accordance with NFRC 102, and resistance to air infiltration in accordance with NFRC 400. Where indicated provide thermally broken frame profiles available for use in both masonry and drywall construction. Fabricate with 1/16” positive thermal break and integral vinyl weatherstripping.

C. Exterior Frames: Fabricated of hot-dipped zinc galvanized steel that complies with ASTM A 653/A 653M, Coating Designation A60.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.
2. Frames: Minimum 14 gauge (0.067-inch -1.7-mm) thick steel sheet.
3. Manufacturers Basis of Design

   a. Curries Company (CU) – Thermal Break TQ Series

D. Interior Frames: Fabricated from cold-rolled steel sheet that complies with ASTM A 1008/A 1008M.

1. Fabricate frames with mitered or coped corners. Profile as indicated on drawings.

2. Frames: Minimum 16 gauge (0.053-inch -1.3-mm) thick steel sheet.
3. Manufacturers Basis of Design:

    a. Curries Company (CU) - C CM Series.
    b. Curries Company (CU) - M Series

E. Fire rated frames: Fabricate frames in accordance with NFPA 80, listed and labeled by a qualified testing agency, for fire-protection ratings indicated

F. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.5 FRAME ANCHORS

A. Jamb Anchors

1. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, formed from A60 metallic coated material, 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.
2. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.
3. Compression Type for Drywall Slip-on (Knock-Down) Frames: Adjustable compression anchors.

B. Floor Anchors: Floor anchors to be provided at each jamb, formed from A60 metallic coated material, not less than 0.042 inches thick.

C. Mortar Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.6 LIGHT OPENINGS AND GLAZING

A. Stops and Moldings: Provide stops and moldings around glazed lites where indicated. Form corners of stops and moldings with butted or mitered hairline joints at fabricator’s shop. Fixed and removable stops to allow multiple glazed lites each to be removed independently. Coordinate frame rabbet widths between fixed and removable stops with the type of glazing and installation indicated.

B. Moldings for Glazed Lites in Doors and Loose Stops for Glazed Lites in Frames: Minimum 20 gauge thick, fabricated from same material as door face sheet in which they are installed.

C. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated. Provide fixed frame moldings and stops on outside of exterior and on secure side of interior doors and frames.

D. Preformed Metal Frames for Light Openings: Manufacturer's standard frame formed of 0.048-inch-thick, cold rolled steel sheet; with baked enamel or powder coated finish; and approved for use in doors of fire protection rating indicated. Match pre-finished door paint color where applicable.

2.7 ACCESSORIES

A. Mullions and Transom Bars: Join to adjacent members by welding or rigid mechanical anchors.

B. Grout Guards: Formed from same material as frames, not less than 0.016 inches thick.

2.8 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. When shipping limitations so dictate, frames for large openings are to be fabricated in sections for splicing or splining in the field by others.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in ANSI/SDI A250.8.

C. Hollow Metal Doors

1. Exterior Doors: Provide optional weep-hole openings in bottom of exterior doors to permit moisture to escape where specified
2. Glazed Lites: Factory cut openings in doors with applied trim or kits to fit. Factory install glazing where indicated.
3. Astragals: Provide overlapping astragals as noted in door hardware sets in Division 08 Section "Door Hardware" on one leaf of pairs of doors where required by NFPA 80 for fire-performance rating or where indicated. Extend minimum 3/4 inch beyond edge of door on which astragal is mounted.
4. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge strap for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".

D. Hollow Metal Frames

1. Shipping Limitations: Where frames are fabricated in sections due to shipping or handling limitations, provide alignment plates or angles at each joint, fabricated of same thickness metal as frames.
2. Welded Frames: Weld flush face joints continuously; grind, fill, dress, and make smooth, flush, and invisible

    a. Welded frames are to be provided with two steel spreaders temporarily attached to the bottom of both jambs to serve as a brace during shipping and handling. Spreader bars are for bracing only and are not to be used to size the frame opening.

3. Sidelight and Transom Bar Frames: Provide closed tubular members with no visible face seams or joints, fabricated from same material as door frame. Fasten members at crossings and to jambs by butt welding.
4. High Frequency Hinge Reinforcement: Provide high frequency hinge reinforcements at door openings 48-inches and wider with mortise butt type hinges at top hinge locations.
5. Continuous Hinge Reinforcement: Provide welded continuous 12 gauge straps for continuous hinges specified in hardware sets in Division 08 Section "Door Hardware".
6. Provide countersunk, flat- or oval-head exposed screws and bolts for exposed fasteners unless otherwise indicated for removable stops, provide security screws at exterior locations.
7. Mortar Guards: Provide guard boxes at back of hardware mortises in frames at all hinges and strike preps regardless of grouting requirements.
8. Floor Anchors: Weld anchors to bottom of jambs and mullions with at least four spot welds

per anchor.

9. Jamb Anchors: Provide number and spacing of anchors as follows.

   a. Masonry Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

      1) Two anchors per jamb up to 60 inches high.
      2) Three anchors per jamb from 60 to 90 inches high.
      3) Four anchors per jamb from 90 to 120 inches high.
      4) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 120 inches high.

   b. Stud wall Type: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c. and as follows:

      1) Three anchors per jamb up to 60 inches high
      2) Four anchors per jamb from 60 to 90 inches high.
      3) Five anchors per jamb from 90 to 96 inches high.
      4) Five anchors per jamb plus 1 additional anchor per jamb for each 24 inches or fraction thereof above 96 inches high.
      5) Two anchors per head for frames above 42 inches wide and mounted in metal stud partitions

10. Door Silencers: Except on weather stripped or gasketed doors, drill stops to receive door silencers. Silencers to be supplied by frame manufacturer regardless if specified in Division 08 Section "Door Hardware".

11. Bituminous Coating: Where frames are fully grouted with an approved Portland Cement based grout or mortar, coat inside of frame throat with a water based bituminous or asphaltic emulsion coating to a minimum thickness of 3 mils DFT, tested in accordance with UL 10C and applied to the frame under a 3rd party independent follow-up service procedure.

E. Hardware Preparation: Factory prepare hollow metal work to receive template mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Division 08 Section "Door Hardware".

1. Locate hardware as indicated, or if not indicated, according to ANSI/SDI A250.8.
2. Reinforce doors and frames to receive non-template, mortised and surface mounted door hardware.
3. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.
4. Coordinate locations of conduit and wiring boxes for electrical connections with Division 26 Sections.

2.9 STEEL FINISHED

A. Prime Finishes: Doors and frames to be cleaned, and chemically treated to insure maximum finish paint adhesion. Surfaces of the door and frame exposed to view to receive a factory applied coat of

rust inhibiting shop primer.

1. Shop Primer: Manufacturer's standard, fast-curing, lead and chromate free primer complying with ANSI/SDI A250.10 acceptance criteria; recommended by primer manufacturer for substrate; and compatible with substrate and field-applied coatings.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. General Contractor to verify the accuracy of dimensions given to the steel door and frame manufacturer for existing openings or existing frames (strike height, hinge spacing, hinge back set, etc).

C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for square, level, twist, and plumb condition.

C. Tolerances shall comply with SDI-117 "Manufacturing Tolerances Standard Steel Doors and Frames”.

D. Drill and tap doors and frames to receive non-template, mortised, and surface-mounted door hardware

3.3 INSTALLATION

A. General: Install hollow metal work plumb, rigid, properly aligned, and securely fastened in place; comply with Drawings and manufacturer's written instructions.

B. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11 and NFPA 80 at fire rated openings.

1. Set frames accurately in position, plumbed, leveled, aligned, and braced securely until permanent anchors are set. After wall construction is complete and frames properly set and secured, remove temporary braces, leaving surfaces smooth and undamaged. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.
3. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar.
4. Grout Requirements: Do not grout head of frames unless reinforcing has been installed in head of frame. Do not grout vertical or horizontal closed mullion members.

C. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch plus or minus 1/16 inch.
b. Between Edges of Pairs of Doors: 1/8 inch plus or minus 1/16 inch.
c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch.
d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch.

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

D. Field Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with hollow metal manufacturer's written instructions.

3.4 ADJUSTING AND CLEANING

A. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

B. Remove grout and other bonding material from hollow metal work immediately after installation.

C. Prime-Coat and Painted Finish Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat, or painted finishes, and apply touchup of compatible air drying, rust-inhibitive primer, zinc rich primer (exterior and galvanized openings) or finish paint.

END OF SECTION

SECTION 084113 - ALUMINUM-FRAMED ENTRANCES AND STOREFRONTS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Aluminum-framed entrance and storefront systems.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Aluminum-framed entrance and storefront systems.

B. Product Data Submittals: For each product.

1. Construction details, material descriptions, dimensions of individual components and profiles, and finishes.
2. Operating characteristics, electrical characteristics, and furnished accessories.

C. Shop Drawings:

1. Plans, elevations, sections, full-size details, and attachments to other work.
2. Details of provisions for assembly expansion and contraction and for draining moisture occurring within the assembly to the exterior.
3. Full-size isometric details of each type of vertical-to-horizontal intersection of aluminum-framed entrance and storefront systems, showing the following:

    a. Joinery, including concealed welds.
    b. Anchorage.
    c. Expansion provisions.
    d. Glazing.
    e. Flashing and drainage.

4. Connection to and continuity with adjacent thermal, weather, air, and vapor barriers.
5. Point-to-point wiring diagrams showing the following:

    a. Power requirements for each electrically operated door hardware.
    b. Location and types of switches, signal device, conduit sizes, and number and size of wires.

D. Samples for Initial Selection: Manufacturer's standard color sheets, showing full range of available colors for each type of exposed finish.

E. Entrance Door Hardware Schedule: Prepared by or under supervision of supplier, detailing fabrication and assembly of entrance door hardware, as well as procedures and diagrams.

Coordinate final entrance door hardware schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of entrance door hardware.

1.3 INFORMATIONAL SUBMITTALS

A. Energy Performance Certificates: For aluminum-framed entrance and storefront systems, accessories, and components, from manufacturer.

1. Basis for Certification: NFRC-certified energy performance values for each aluminum-framed entrance and storefront system.

B. Product Test Reports: For aluminum-framed entrance and storefront systems, for tests performed by a qualified testing agency.

C. Sample Warranties: For aluminum-framed entrance and storefront systems.

1.4 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For aluminum-framed entrance and storefront systems.

B. Maintenance Data for Structural Sealant: For structural-sealant-glazed storefront. Include ASTM C1401 recommendations for post-installation-phase quality-control program.

1.5 QUALITY ASSURANCE

A. Installer Qualifications:

1. Fabricator of products.
2. Entity that employs installers and supervisors who are trained and approved by manufacturer.
3. Authorized representative who is trained and approved by manufacturer.

B. Product Options: Information on Drawings and in Specifications establishes requirements for aesthetic effects and performance characteristics of assemblies. 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.

1. Do not change intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If changes are proposed, submit comprehensive explanatory data to Architect for review.

C. Structural-Sealant Glazing: Comply with ASTM C1401 for design and installation of storefront systems that include structural glazing.

1.6 WARRANTY

A. Special Warranty: Manufacturer and Installer agree to repair or replace components of aluminum-framed entrance and storefront systems that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Structural failures, including binding.
b. Faulty operation of hardware.
c. Deterioration of metals, metal finishes, and other materials beyond normal weathering and use.

2. Warranty Period: Two years from date of Substantial Completion.

B. Special Finish Warranty, Factory-Applied Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of factory-applied finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D4214.
c. Cracking, checking, peeling, or failure of paint to adhere to bare metal.

2. Warranty Period: **10** years from date of Substantial Completion.

C. Special Finish Warranty, Anodized Finishes: Standard form in which manufacturer agrees to repair finishes or replace aluminum that shows evidence of deterioration of anodized finishes within specified warranty period.

1. Deterioration includes, but is not limited to, the following:

a. Color fading more than 5 Delta E units when tested in accordance with ASTM D 2244.
b. Chalking in excess of a No. 8 rating when tested in accordance with ASTM D 4214.
c. Cracking, peeling, or chipping.

2. Warranty Period: **10** years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SOURCE LIMITATIONS

A. Obtain all components of aluminum-framed entrance and storefront system, including framing spandrel panels and venting windows and accessories, from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

A. General Performance: Comply with performance requirements specified, as determined by testing of aluminum-framed entrance and storefront systems representing those indicated for this Project without failure due to defective manufacture, fabrication, installation, or other defects in construction.

1. Aluminum-framed entrance and storefront systems to withstand movements of supporting structure, including, but not limited to, twist, column shortening, long-term creep, and deflection from uniformly distributed and concentrated live loads.
2. Failure also includes the following:

a. Thermal stresses transferring to building structure.
b. Glass breakage.
c. Noise or vibration created by wind and thermal and structural movements.
d. Loosening or weakening of fasteners, attachments, and other components.
e. Failure of operating units.

B. Structural Loads:

1. Wind Loads: As indicated on Drawings or appropriate for the project location.
2. Other Design Loads: As indicated on Drawings.

C. Deflection of Framing Members Supporting Glass: At design wind load, as follows:

1. Deflection Normal to Wall Plane: Limited to 1/175 of clear span for spans of up to 13 feet 6 inches and to 1/240 of clear span plus 1/4 inch for spans greater than 13 feet 6 inches.
2. Deflection Parallel to Glazing Plane: Limited to amount not exceeding that which reduces glazing bite to less than 75 percent of design dimension and that which reduces edge clearance between framing members and glazing or other fixed components to less than 1/8 inch.

a. Operable Units: Provide a minimum 1/16-inch clearance between framing members and operable units.

D. Structural: Test in accordance with ASTM E330/E330M as follows:

1. When tested at positive and negative wind-load design pressures, storefront assemblies, including entrance doors, do not evidence deflection exceeding specified limits.
2. When tested at 150 percent of positive and negative wind-load design pressures, storefront assemblies, including entrance doors and anchorage, do not evidence material failures, structural distress, or permanent deformation of main framing members exceeding 0.2 percent of span.
3. Test Durations: As required by design wind velocity, but not less than 10 seconds.

E. Water Penetration under Static Pressure: Test in accordance with ASTM E331 as follows:

1. No evidence of water penetration through fixed glazing and framing areas, including entrance doors, when tested in accordance with a minimum static-air-pressure differential

of 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).

F. Water Penetration under Dynamic Pressure: Test in accordance with AAMA 501.1 as follows:

1. No evidence of water penetration through fixed glazing and framing areas when tested at dynamic pressure equal to 20 percent of positive wind-load design pressure, but not less than 6.24 lbf/sq. ft. (300 Pa).
2. Maximum Water Leakage: In accordance with AAMA 501.1. Water leakage does not include water controlled by flashing and gutters, or water that is drained to exterior.

G. Seismic Performance: Aluminum-framed entrance and storefront systems to withstand the effects of earthquake motions determined in accordance with ASCE/SEI 7.

1. Seismic Drift Causing Glass Fallout: Complying with criteria for passing based on building occupancy type when tested in accordance with AAMA 501.6 at design displacement and 1.5 times the design displacement.

H. Energy Performance: Certified and labeled by manufacturer for energy performance as follows:

1. Thermal Transmittance (U-factor):

a. Fixed Glazing and Framing Areas: U-factor for the system of not more than 0.38 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
b. Entrance Doors: U-factor of not more than 0.77 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.
c. Venting Windows: Whole window U-factor of not more than 0.45 Btu/sq. ft. x h x deg F as determined in accordance with NFRC 100.

2. Solar Heat-Gain Coefficient (SHGC):

a. All Fixed and Operable Glazing and Framing Areas: SHGC for the system of not

3. Air Leakage:

a. Fixed Glazing and Framing Areas: Air leakage for the system of not more than 0.06 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa) when tested in accordance with ASTM E283.
b. Entrance Doors: Air leakage of not more than 1.0 cfm/sq. ft. (5.08 L/s per sq. m) at a static-air-pressure differential of 1.57 lbf/sq. ft. (75 Pa).
c. Venting Windows: Whole window air leakage of not more than 0.3 cfm/sq. ft. (0.30 L/s per sq. m) at a static-air-pressure differential of 6.24 lbf/sq. ft. (300 Pa) when tested in accordance with AAMA/WDMA/CSA 101/I.S.2/A440.

4. Condensation Resistance Factor (CRF):

a. Fixed Glazing and Framing Areas: CRF for the system of not less than 55 as determined in accordance with AAMA 1503.
b. Entrance Doors: CRF of not less than 57 as determined in accordance with AAMA 1503.

c. Venting Windows: Whole window CRF of not less than 52 as determined in accordance with AAMA 1503.

I. Thermal Movements: Allow for thermal movements resulting from ambient and surface temperature changes.

1. Temperature Change: 120 deg F, ambient; 180 deg F, material surfaces.

J. Structural-Sealant Joints:

1. Designed to carry gravity loads of glazing.

K. Structural Sealant: ASTM C1184. Capable of withstanding tensile and shear stresses imposed by structural-sealant-glazed, aluminum-framed entrance and storefront systems without failing adhesively or cohesively. When tested for preconstruction adhesion and compatibility, cohesive failure of sealant to occur before adhesive failure.

1. Adhesive failure occurs when sealant pulls away from substrate cleanly, leaving no sealant material behind.
2. Cohesive failure occurs when sealant breaks or tears within itself but does not separate from each substrate, because sealant-to-substrate bond strength exceeds sealant's internal strength.

2.3 ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Basis of Design: Kawneer Thermal door and storefront systems. Style shall be as appropriate to match existing conditions and surrounding materials.

B. Framing Members: Manufacturer's extruded- or formed-aluminum framing members of thickness required and reinforced as required to support imposed loads.

1. Exterior Framing Construction: Thermally broken.
2. Interior Vestibule Framing Construction: Nonthermal.
3. Glazing System: Retained mechanically with gaskets on four sides or Retained mechanically with gaskets on two sides and structural sealant on two sides. Match Existing assembly at specific location.
4. Glazing Plane: Match Existing assembly at specific location.
5. Finish: Match Existing assembly at specific location.
6. Fabrication Method: Field-fabricated stick system.
7. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.
8. Steel Reinforcement: As required by manufacturer.

C. Backer Plates: Manufacturer's standard, continuous backer plates for framing members, if not integral, where framing abuts adjacent construction.

D. Brackets and Reinforcements: Manufacturer's standard high-strength aluminum with nonstaining, nonferrous shims for aligning system components.

E. Insulated Spandrel Panels:

1. Laminated, metal-faced flat panels with no deviations in plane exceeding 0.8 percent of panel dimension in width or length.

a. Overall Panel Thickness: Match Existing assembly at specific location.
b. Exterior and Interior Skin: Match Existing assembly at specific location.

1) Thickness: Match Existing assembly at specific location.
2) Finish: Match Existing assembly at specific location.
3) Texture: Match Existing assembly at specific location.
4) Backing Sheet: Match Existing assembly at specific location.

c. Thermal Insulation Core: Manufacturer's standard rigid, closed-cell, polyisocyanurate board.
d. Surface-Burning Characteristics: Comply with ASTM E84; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1) Flame-Spread Index: 25 or less.
2) Smoke-Developed Index: 50 or less.

F. Venting Windows:

1. Manufacturer's standard units, complying with AAMA/WDMA/CSA 101/I.S.2/A440, with self-flashing mounting fins, and as follows:

a. Window Type: As indicated on Drawings or as existing in the field.
b. Minimum Performance Class: CW.
c. Minimum Performance Grade: 30.
d. Hardware: Match existing type and material, possibly including the following:

1) Cam handle locking system.
2) Multi-point locking system.
3) Pole-operated, cam handle locking system, where rail is more than 72 inches above floor.
4) Rotary operator.
5) Steel or bronze operating arms.
6) Limit Devices: Concealed friction adjustor and adjustable stay barlimit devices designed to restrict sash opening.

a) Limit clear opening to 4 inches for ventilation; with custodial key release.

e. Weather Stripping: Provide full-perimeter weather stripping for each operable sash unless otherwise indicated.
f. Insect Screens: Provide removable insect screen on each operable exterior sash, with screen frame finished to match window unit, complying with SMA 1004 or SMA 1201, and Match Existing assembly at specific location.

g. Glazing: Match Existing assembly at specific location. Meet current energy code requirements indicated above.
h. Finish: Match Existing assembly at specific location.

G. Entrance Doors: Manufacturer's standard glazed entrance doors for manual-swing or automatic operation.

1. Door Construction: Match Existing assembly at specific location with minimum 0.125-inch thick, extruded-aluminum tubular rail and stile members. Mechanically fasten corners with reinforcing brackets that are deeply penetrated and fillet welded or that incorporate concealed tie rods.

a. Thermal Construction: High-performance plastic connectors separate aluminum members exposed to the exterior from members exposed to the interior.

2. Door Design: Match Existing assembly at specific location.
3. Glazing Stops and Gaskets: Match Existing assembly at specific location.

4. Finish: Match adjacent storefront framing finish.

2.4 ENTRANCE DOOR HARDWARE

A. Entrance Door Hardware: Hardware not specified in this Section is specified in Section 087100 "Door Hardware."

B. General: Provide entrance door hardware and entrance door hardware sets indicated in door and frame schedule for each entrance door, to comply with requirements in this Section.

1. Entrance Door Hardware Sets: Provide quantity, item, size, finish or color indicated, and named manufacturers' products.
2. Sequence of Operation: Provide electrified door hardware function, sequence of operation, and interface with other building control systems indicated.
3. Opening-Force Requirements:

a. Egress Doors: Not more than 15 lbf to release the latch and not more than 30 lbf to set the door in motion and not more than 15 lbf to open the door to its minimum required width.
b. Accessible Interior Doors: Not more than 5 lbf to fully open door.

2.5 GLAZING

A. Glazing: Comply with Section 088000 "Glazing."

B. Glazing Gaskets: Manufacturer's standard sealed-corner pressure-glazing system of black, resilient elastomeric glazing gaskets, setting blocks, and shims or spacers.

C. Glazing Sealants: As recommended by manufacturer.

D. Structural Glazing Sealants: ASTM C1184 chemically curing silicone formulation that is compatible with system components with which it comes in contact; specifically formulated and tested for use as structural sealant and approved by structural-sealant manufacturer for use in storefront system indicated.

1. Color: Match Existing assembly at specific location.

E. Weatherseal Sealants: ASTM C920 for Type S; Grade NS; Class 25; Uses NT, G, A, and O; chemically curing silicone formulation that is compatible with structural sealant and other system components with which it comes in contact; recommended by structural-sealant, weatherseal-sealant, and structural-sealant-glazed storefront manufacturers for this use.

1. Color: Match structural sealant.

2.6 MATERIALS

A. Sheet and Plate: ASTM B209 (ASTM B209M).

B. Extruded Bars, Rods, Profiles, and Tubes: ASTM B221 (ASTM B221M).

C. Structural Profiles: ASTM B308/B308M.

D. Steel Reinforcement:

1. Structural Shapes, Plates, and Bars: ASTM A36/A36M.
2. Cold-Rolled Sheet and Strip: ASTM A1008/A1008M.
3. Hot-Rolled Sheet and Strip: ASTM A1011/A1011M.

E. Steel Reinforcement Primer: Manufacturer's standard zinc-rich, corrosion-resistant primer complying with SSPC-PS Guide No. 12.00; applied immediately after surface preparation and pretreatment. Select surface preparation methods in accordance with recommendations in SSPC-SP COM, and prepare surfaces in accordance with applicable SSPC standard.

2.7 ACCESSORIES

A. Automatic Door Operators: Section 087113 "Power Door Operators."

B. Fasteners and Accessories: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

1. Use self-locking devices where fasteners are subject to loosening or turning out from thermal and structural movements, wind loads, or vibration.
2. Reinforce members as required to receive fastener threads.

C. Anchors: Three-way adjustable anchors with minimum adjustment of 1 inch that accommodate fabrication and installation tolerances in material and finish compatible with adjoining materials and recommended by manufacturer.

1. Concrete and Masonry Inserts: Hot-dip galvanized cast-iron, malleable-iron, or steel inserts complying with ASTM A123/A123M or ASTM A153/A153M requirements.

D. Concealed Flashing: Manufacturer's standard corrosion-resistant, nonstaining, nonbleeding flashing compatible with adjacent materials.

E. Bituminous Paint: Cold-applied asphalt-mastic paint containing no asbestos, formulated for 30-mil thickness per coat.

F. Rigid PVC filler.

2.8 FABRICATION

A. Form or extrude aluminum shapes before finishing.

B. Weld in concealed locations to greatest extent possible to minimize distortion or discoloration of finish. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.

C. Fabricate components that, when assembled, have the following characteristics:

1. Profiles that are sharp, straight, and free of defects or deformations.
2. Accurately fitted joints with ends coped or mitered.
3. Physical and thermal isolation of glazing from framing members.
4. Accommodations for thermal and mechanical movements of glazing and framing to maintain required glazing edge clearances.
5. Provisions for field replacement of glazing from interior.
6. Fasteners, anchors, and connection devices that are concealed from view to greatest extent possible.

D. Mechanically Glazed Framing Members: Fabricate for flush glazing without projecting stops.

E. Structural-Sealant-Glazed Framing Members: Include accommodations for using temporary support device to retain glazing in place while structural sealant cures.

F. Entrance Door Frames: Reinforce as required to support loads imposed by door operation and for installing entrance door hardware.

1. At interior and exterior doors, provide compression weather stripping at fixed stops.

G. Entrance Doors: Reinforce doors as required for installing entrance door hardware.

1. At pairs of exterior doors, provide sliding-type weather stripping retained in adjustable strip and mortised into door edge.
2. At exterior doors, provide weather sweeps applied to door bottoms.

H. Entrance Door Hardware Installation: Factory install entrance door hardware to the greatest extent possible. Cut, drill, and tap for factory-installed entrance door hardware before applying finishes.

I. After fabrication, clearly mark components to identify their locations in Project in accordance with Shop Drawings.

2.9 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

1. Color: Match Existing assembly at specific location.

C. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish. Acceptable finish only in order to Match Existing assembly at specific location.

1. Color and Gloss: Match Existing assembly at specific location.

D. Superior-Performance Organic Finish, Three-Coat PVDF: Fluoropolymer finish complying with AAMA 2605 and containing not less than 70 percent PVDF resin by weight in both color coat and clear topcoat.

1. Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions for seacoast and severe environments.
2. Color and Gloss: Match Existing assembly at specific location.

2.10 SOURCE QUALITY CONTROL

A. Structural Sealant: Perform quality-control procedures complying with ASTM C1401 recommendations, including, but not limited to, assembly material qualification procedures, sealant testing, and assembly fabrication reviews and checks.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION OF ALUMINUM-FRAMED ENTRANCE AND STOREFRONT SYSTEMS

A. Comply with manufacturer's written instructions.

B. Do not install damaged components.

C. Fit joints to produce hairline joints free of burrs and distortion.

D. Rigidly secure nonmovement joints.

E. Install anchors with separators and isolators to prevent metal corrosion and electrolytic deterioration and to prevent impeding movement of moving joints.

F. Seal perimeter and other joints watertight unless otherwise indicated.

G. Metal Protection:

1. Where aluminum is in contact with dissimilar metals, protect against galvanic action by painting contact surfaces with materials recommended by manufacturer for this purpose or by installing nonconductive spacers.
2. Where aluminum is in contact with concrete or masonry, protect against corrosion by painting contact surfaces with bituminous paint.

H. Set continuous sill members and flashing in full sealant bed, as specified in Section 079200 "Joint Sealants," to produce weathertight installation.

I. Install joint filler behind sealant as recommended by sealant manufacturer.

J. Install components plumb and true in alignment with established lines and grades.

K. Install operable units level and plumb, securely anchored, and without distortion. Adjust weather-stripping contact and hardware movement to produce proper operation.

L. Install entrance doors to produce smooth operation and tight fit at contact points.

1. Exterior Doors: Install to produce weathertight enclosure and tight fit at weather stripping.
2. Field-Installed Entrance Door Hardware: Install surface-mounted entrance door hardware in accordance with entrance door hardware manufacturers' written instructions using concealed fasteners to greatest extent possible.

M. Install glazing as required by manufacturer.

N. Install structural glazing as follows:

1. Prepare surfaces that will contact structural sealant in accordance with sealant manufacturer's written instructions, to ensure compatibility and adhesion. Preparation includes, but is not limited to, cleaning and priming surfaces.
2. Set glazing into framing in accordance with sealant manufacturer and framing manufacturer's written instructions and standard practice. Use a spacer or backer as recommended by manufacturer.
3. Set glazing with proper orientation so that coatings face exterior or interior as specified.
4. Hold glazing in place using temporary retainers of type and spacing recommended by manufacturer, until structural sealant joint has cured.

5. Apply structural sealant to completely fill cavity, in accordance with sealant manufacturer and framing manufacturer's written instructions and in compliance with local codes.
6. Apply structural sealant at temperatures indicated by sealant manufacturer for type of sealant.
7. Allow structural sealant to cure in accordance with manufacturer's written instructions.
8. Clean and protect glass as indicated in Section 088000 "Glazing."
9. After structural sealant has completely cured, remove temporary retainers and insert backer rod between lites of glass as recommended by sealant manufacturer.
10. Install weatherseal sealant to completely fill cavity, in accordance with sealant manufacturer's written instructions, to produce weatherproof joints.

3.3 ERECTION TOLERANCES

A. Install aluminum-framed entrance and storefront systems to comply with the following maximum tolerances:

1. Plumb: 1/8 inch in 10 feet; 1/4 inch in 40 feet.
2. Level: 1/8 inch in 20 feet; 1/4 inch in 40 feet.
3. Alignment:

    a. Where surfaces abut in line or are separated by reveal or protruding element up to 1/2 inch wide, limit offset from true alignment to 1/16 inch.
    b. Where surfaces are separated by reveal or protruding element from 1/2 to 1 inch wide, limit offset from true alignment to 1/8 inch.
    c. Where surfaces are separated by reveal or protruding element of 1 inch wide or more, limit offset from true alignment to 1/4 inch.

4. Location: Limit variation from plane to 1/8 inch in 12 feet; 1/2 inch over total length.

END OF SECTION

SECTION 087100 - DOOR HARDWARE

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 BASIS OF DESIGN

A. The following Products and Manufacturers are provided by the Architect as the Basis of Design for Construction and Bidding Purposes. No Substitutions will be accepted without meeting all of the required performance specifications of the Basis of Design, written Approval of the Architect and Owner, a Statement of Benefit to the Owner of the Proposed Substitution versus the specified product (cost, performance, etc), and demonstration that the proposed alternate solution will work together as a complete and warranted system, along with any other components of the work (including security and electrical components).

1.3 SUMMARY

A. This Section includes commercial door hardware for the following:

1. Swinging doors.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.

C. Related Sections:

1. Division 08 Section “Hollow Metal Doors and Frames”.
2. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.

8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.
2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.4 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."
2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.
3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

    a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
    b. Complete (risers, point-to-point) access control system block wiring diagrams.
    c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

1.5 CLOSEOUT SUBMITTALS

A. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

B. Project Record Documents: Provide record documentation of as-built door hardware sets in digital format (.pdf, .docx, .xlsx, .csv) and as required in Division 01, Project Record Documents.

1.6 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this

Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.
2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.7 DELIVERY, STORAGE AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.8 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.9 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 BUTT HINGES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

a. Two Hinges: For doors with heights up to 60 inches.
b. Three Hinges: For doors with heights 61 to 90 inches.
c. Four Hinges: For doors with heights 91 to 120 inches.
d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for all out-swinging lockable doors.

5. Manufacturers:

a. McKinney (MK) - TA/T4A Series, 5-knuckle.

2.2 POWER TRANSFER DEVICES

A. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Securitron (SU) - EL-CEPT Series.

B. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

a. McKinney (MK) - QC-C Series.

2.3 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.

C. Small Format Interchangeable Cores: Provide small format interchangeable cores (SFIC) as specified, core insert, removable by use of a special key; usable with other manufacturers' cylinders.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Construction Keys (where required): Ten (10).
3. Construction Control Keys (where required): Two (2).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Furnish a list of opening numbers with locking devices, showing cylinder types and quantities required when cylinders or cores are to be owner furnished.

2.4 KEY CONTROL

A. Key Control Cabinet: Provide a key control system including envelopes, labels, and tags with self-locking key clips, receipt forms, 3-way visible card index, temporary markers, permanent markers, and standard metal cabinet. Key control cabinet shall have expansion capacity of 150% of the number of locks required for the project.

1. Manufacturers:

a. Lund Equipment (LU).
b. MMF Industries (MM).
c. Telkee (TK).

2.5 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.6 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.
2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.
3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer’s catalog and template book for specific requirements.
4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.
5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.
6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.
8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2” wide stiles.
9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.
10. Rail Sizing: Provide exit device rails factory sized for proper door width application.
11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed exit devices. Listed manufacturers shall meet all functions and features as specified herein.

1. Manufacturers:

    a. Sargent Manufacturing (SA) - 80 Series.

2.7 SURFACE DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.
2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.
3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.
4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.
5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.
6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Heavy Duty): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron or aluminum alloy body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control. Provide non-handed units standard.

1. Heavy duty surface mounted door closers shall have a 30-year warranty.

2. Manufacturers:

   a. Norton Rixson (NO) - 7500 Series.

2.8 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.
2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.
3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.
4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

   a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.
6. Manufacturers:

    a. Rockwood (RO).

2.9 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies 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 according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NFPA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. Pemko (PE).

2.10 ELECTRONIC ACCESSORIES

A. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

    a. Securitron (SU) - DPS Series.

2.11 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.12 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Push Plates and Door Pulls: When through-bolt fasteners are in the same location as a push plate, countersink the fasteners flush with the door face allowing the push plate to sit flat against the door.

E. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

F. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.
2. The supplier is responsible for handing and sizing all products.
3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.
4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Refer to Section 080671, Door Hardware Sets, for hardware sets.

END OF SECTION

SECTION 087113 - POWER DOOR OPERATORS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Low-energy door operators for swinging doors.

1.2 DEFINITIONS

A. AAADM: American Association of Automatic Door Manufacturers.

B. Activation Device: A control that, when actuated, sends an electrical signal to the door operator to open the door.

C. Double-Egress (Doors): A pair of doors that simultaneously swing, with the two doors moving in opposite directions with no mullion between them.

D. Double-Swing (Doors): A pair of doors that swing, with the two doors moving in opposite directions with a mullion between them; each door functioning as a single-swing door.

E. Safety Device: A control that, to avoid injury, prevents a door from opening or closing.

F. For automatic door terminology, see BHMA A156.10 and BHMA A156.19 for definitions of terms.

1.3 COORDINATION

A. Coordinate sizes and locations of recesses in concrete floors for recessed control mats that control power door operators. Concrete, reinforcement, and formwork requirements are specified elsewhere.

B. Templates: Distribute for doors, frames, and other work specified to be factory prepared and reinforced for installing power door operators.

C. Coordinate hardware for doors with operators to ensure proper size, thickness, hand, function, and finish.

D. Electrical System Roughing-in: Coordinate layout and installation of power door operators with connections to the following:

1. Power supplies.
2. Access-control system.
3. Remote activation devices.
4. Remote monitoring systems.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1.5 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for power door operators.
2. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.

B. Shop Drawings: For power door operators.

1. Include plans, elevations, sections, hardware mounting heights, and attachment details.
2. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
3. Indicate locations of activation and safety devices.
4. Include diagrams for power, signal, and control wiring.

1.6 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

B. Product Certificates: For each type of power door operator. For each operator for fire-rated door assemblies, certify that operator is listed and labeled by a qualified testing agency acceptable to authorities having jurisdiction for use on types and sizes of labeled fire doors required.

C. Field quality-control reports.

D. Sample Warranties: For manufacturer's special warranties.

1.7 CLOSEOUT SUBMITTALS

A. Maintenance Data: For power door operators, safety devices, and control systems, to include in maintenance manuals.

1.8 QUALITY ASSURANCE

A. Installer Qualifications: An authorized representative who is trained and approved by manufacturer for installation and maintenance of units required for this Project.

B. Certified Inspector Qualifications: Certified by AAADM.

1.9 WARRANTY

A. Special Warranty: Manufacturer agrees to repair or replace components of power door operators that fail in materials or workmanship within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Faulty or sporadic operation of power door operator, including controls.
b. Deterioration of metals, metal finishes, and other materials beyond normal weathering or use.

2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Refer to Door Hardware Schedule for Basis of Design

B. Source Limitations: Obtain power door operators, including activation and safety devices, from single source from single manufacturer.

2.2 POWER DOOR OPERATORS, GENERAL

A. General: Provide operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated; and in accordance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation and safety devices.

1. Emergency Breakaway: Where indicated for center-pivoted doors, provide emergency breakaway feature for reverse swing of doors. Equip system to discontinue power to power door operator when door is in emergency breakaway position, to return door to closed position after breakaway, and to automatically reset.
2. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.
3. Wind Load: Provide door operators on exterior doors that will open and close doors and maintain them in fully closed position when subjected to wind load of 20psf.

B. Operating System: Refer to Door Hardware Schedule Basis of Design for operation.

C. Hinges: See Section 087100 "Door Hardware" for hinge type for each door that door operator shall accommodate.

D. Housing for Overhead Concealed Operators: Fabricated from minimum 0.125-inch thick, extruded or formed aluminum and extending full width of door opening, including door jambs, to conceal door operators and controls. Provide hinged or removable access panels for service and adjustment of door operators and controls. Secure panels to prevent unauthorized access.

E. Cover for Surface-Mounted Operators: Fabricated from 0.125-inch thick, extruded or formed aluminum; manufacturer's standard width; with enclosed end caps, provision for maintenance access, and fasteners concealed when door is in closed position.

F. Brackets and Reinforcements: Fabricated from aluminum with nonstaining, nonferrous shims for aligning system components.

G. Fire-Door Package: Consisting of UL-listed latch mechanism, power-reset box, and caution signage for fire-rated doors. Latch mechanism shall allow door to swing free during automatic operation; when fire is detected, latch actuator shall cause exit hardware to latch when door closes. Provide latch actuators with fail-secure design.

H. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

2.3 POWER DOOR OPERATORS FOR SWINGING DOORS

A. Standard: BHMA A156.10.

B. Performance Requirements:

1. Opening Force:

   a. Power-Operated Doors: Not more than 50 lbf required to manually set door in motion if power fails; not more than 15 lbf required to open door to minimum required width.
   b. Power-Operated Swinging Doors: Not more than 30 lbf required to manually open door if power fails.
   c. Breakaway Device for Power-Operated Doors: Not more than 50 lbf required for breakaway door or panel to open.

2. Entrapment-Prevention Force: Not more than 40 lbf required to prevent stopped door in the last 10 degrees of opening from moving in the direction of opening; not more than 30 lbf required to prevent stopped door from moving in direction of closing.

C. Configuration: Operator to control single swinging door or pair of swinging doors. See Drawings and Door Schedule for details.

1. Traffic Pattern: Match Existing.
2. Operator Mounting: Match Existing.

D. Operation: Power opening and spring closing. Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.10.

E. Operating System: See Door Hardware Schedule for Basis of Design.

F. Microprocessor Control Unit: Solid-state controller.

G. Features:

1. Adjustable opening and closing speed.
2. Adjustable opening and closing force.
3. Adjustable backcheck.
4. Adjustable hold-open time from zero to 30 seconds.
5. Adjustable time delay.
6. Adjustable acceleration.
7. Adjustable limit switch.
8. Obstruction recycle.
9. Power door re-open if stopped while closing.
10. On-off/hold-open switch to control electric power to operator; key operated.

H. Controls: Activation and safety devices as indicated on Drawings and in accordance with BHMA standards.

1. Activation Device, Switch: Match Existing; Typically: Push-plate switch on each side of door to activate door operator.
2. Safety Device, Presence Sensor: Mounted on door header or horizontal door muntin to detect pedestrians in presence zone and to prevent door from closing.

I. Exposed Finish: Finish matching door hardware.

1. Color: Match Existing.

2.4 LOW-ENERGY DOOR OPERATORS FOR SWINGING DOORS

A. Standard: BHMA A156.19.

B. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment-Prevention Force: Not more than 15 lbf required to prevent stopped door from closing or opening.

C. Configuration, Single: Operator to control single swinging door.

1. Traffic Pattern: Match Existing.
2. Operator Mounting: Match Existing.

D. Configuration, Pair: Operator to control pair of swinging doors.

1. Traffic Pattern: Match Existing.
2. Operator Mounting: Match Existing.

E. Operation: Power opening and spring closing. Provide time delay for door to remain open before initiating closing cycle as required by BHMA A156.19. When not in automatic mode, door operator shall function as manual door closer, with or without electrical power.

F. Operating System: See Door Hardware Schedule.

G. Microprocessor Control Unit: Solid-state controller.

H. Features:

1. Adjustable opening and closing speed.
2. Adjustable opening and closing force.
3. Adjustable backcheck.
4. Adjustable hold-open time from zero to 30 seconds.
5. Adjustable time delay.
6. Adjustable acceleration.
7. Adjustable limit switch.
8. Obstruction recycle.
9. On-off/hold-open switch to control electric power to operator; key operated.

I. Activation Device: Match Existing, Typically: Push-plate switch on each side of door to activate door operator.

J. Exposed Finish: Finish matching door hardware.

1. Color: Match Existing.

2.5 MATERIALS

A. Aluminum: Alloy and temper recommended by manufacturer for type of use and finish indicated.

1. Extrusions: ASTM B221 (ASTM B221M).
2. Sheet: ASTM B209 (ASTM B209M).

B. Stainless Steel Sheet: ASTM A240/A240M or ASTM A666, Type 304 stretcher-leveled standard of flatness, in manufacturer's standard thickness.

C. Brass Sheet: ASTM B36/B36M, Alloy UNS No. C26000 (cartridge brass, 70 percent copper), in manufacturer's standard thickness.

D. Bronze Sheet: ASTM B36/B36M, Alloy UNS No. C28000 (muntz metal, 60 percent copper) or Alloy UNS No. C23000 (red brass, 85 percent copper), in manufacturer's standard thickness.

E. Polycarbonate Sheet: ASTM C1349, Appendix X1, Type II, coated, mar-resistant, UV-stabilized polycarbonate with coating on both surfaces.

F. Fasteners and Accessories: Corrosion-resistant, nonstaining, nonbleeding fasteners and accessories compatible with adjacent materials.

2.6 CONTROLS

A. General: Provide controls, including activation and safety devices, in accordance with BHMA standards; for condition of exposure; and for long-term, maintenance-free operation under normal traffic load for occupancy type indicated. Coordinate activation and safety devices with door operation and door operator mechanisms.

B. Motion Sensors: Self-contained, K-band-frequency, microwave-scanner units; fully enclosed in plastic housing; adjustable to provide detection field sizes and functions required by BHMA A156.10.

1. Provide capability for switching between bidirectional and unidirectional detection.
2. For one-way traffic, sensor on egress side shall not be active when doors are fully closed.

C. Presence Sensors: Self-contained, active-infrared scanner units; adjustable to provide detection field sizes and functions required by BHMA A156.10. Sensors shall remain active at all times.

D. Photoelectric Beams: Pulsed infrared, sender-receiver assembly for recessed mounting. Beams shall not be active when doors are fully closed.

E. Push-Plate Switch: Momentary-contact door control switch with flat push-plate actuator with contrasting-colored, engraved message.

1. Configuration:

a. Match Existing, typically Square push plate with 4-by-4-inch junction box.

1) Mounting: Match Existing.

2. Push-Plate Material: Stainless steel as selected by Architect from manufacturer's full range.
3. Message: International symbol of accessibility and "Push to Open."

F. Wireless or Remote Radio-Control Switch: Radio-control system consisting of header-mounted receiver and wall-mounted transmitter switch. This option only as required to Match Existing conditions.

1. Wall-Mounted Transmitter Switch: One red-button, momentary-contact actuator enclosed in 4-by-4-inch junction box. Provide Stainless Steel cover engraved with "Press Button to Open" in white text and with international symbol of accessibility.

G. Electrical Interlocks: Unless units are equipped with self-protecting devices or circuits, provide electrical interlocks to prevent activation of operator when door is locked, latched, or bolted.

2.7 ACCESSORIES

A. Signage: As required by cited BHMA standard for type of door and its operation.

1. Application Process: Operator manufacturer's standard process

2. Provide sign materials with instructions for field application when operators are installed.

2.8 FABRICATION

A. Factory fabricate power door operators to comply with indicated standards.

B. Form aluminum shapes before finishing.

C. Fabricate exterior components to drain condensation and water-passing joints within operator enclosure to the exterior.

D. Use concealed fasteners to greatest extent possible. Where exposed fasteners are required, use countersunk Phillips flat-head machine screws, finished to match operator.

2.9 GENERAL FINISH REQUIREMENTS

A. Protect mechanical finishes on exposed surfaces from damage by applying strippable, temporary, protective covering before shipping.

B. Apply organic and anodic finishes to formed metal after fabrication unless otherwise indicated.

C. Appearance of Finished Work: Noticeable variations in same piece are unacceptable. Variations in appearance of adjoining components are acceptable if they are within range of approved Samples and are assembled or installed to minimize contrast.

2.10 ALUMINUM FINISHES

A. Clear Anodic Finish: AAMA 611, AA-M12C22A41, Class I, 0.018 mm or thicker.

B. Color Anodic Finish: AAMA 611, AA-M12C22A42/A44, Class I, 0.018 mm or thicker.

C. Baked-Enamel or Powder-Coat Finish: AAMA 2603 except with a minimum dry film thickness of 1.5 mils. Comply with coating manufacturer's written instructions for cleaning, conversion coating, and applying and baking finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances, door and frame preparation and reinforcements, and other conditions affecting performance of power door operators.

B. Examine roughing-in for electrical systems to verify actual locations of power connections before power door operator installation.

C. Verify that full-height finger guards are installed at each door with pivot hinges, where door has a clearance at hinge side greater than 1/4 inch and less than 3/4 inch with door in any position.

D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

A. Install power door operators in accordance with manufacturer's written instructions and cited BHMA standard for type of door operation and direction of pedestrian travel, including signage, controls, wiring, remote power units if any, and connection to building's power supply.

1. Do not install damaged components. Fit joints to produce hairline joints free of burrs and distortion.
2. Install operators true in alignment with established lines and door geometry without warp or rack. Anchor securely in place.

B. Controls: Install activation and safety devices in accordance with manufacturer's written instructions and cited BHMA standard for operator type and direction of pedestrian travel. Connect control wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. Access-Control System: Connect operators to access-control system as specified in Section 28 "Access Control Hardware Devices."

D. Signage: Apply on both sides of each door as required by cited BHMA standard for type of door operator and direction of pedestrian travel.

3.3 FIELD QUALITY CONTROL

A. Perform the following tests and inspections:

1. Test and inspect each power door operator installation, using AAADM inspection forms, to determine compliance of installed systems with applicable BHMA standards.

B. Power door operators will be considered defective if they do not pass tests and inspections.

C. Prepare test and inspection reports.

3.4 ADJUSTING

A. Adjust power door operators to function smoothly and lubricate as recommended by manufacturer; comply with requirements of applicable BHMA standards.

1. Adjust operators on exterior doors for tight closure.

B. After completing installation of power door operators, inspect exposed finishes on doors and operators. Repair damaged finish to match original finish.

C. Readjust power door operators and controls after repeated operation of completed installation equivalent to three days' use by normal traffic (100 to 300 cycles).

D. Occupancy Adjustment: When requested within 12 months of date of Substantial Completion, provide on-site assistance in adjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

3.5 DEMONSTRATION

A. Engage a factory-authorized service representative to train Owner's maintenance personnel to adjust, operate, and maintain power door operators.

END OF SECTION

SECTION 090320 - HISTORIC TREATMENT OF PLASTER

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Repair and replacement of historic interior and exterior lime plaster.
2. Repair and replacement of interior gypsum plaster.
3. Replication of cast lime and gypsum plasterwork.

1.3 ALLOWANCES

A. Allowances for historic treatment of plaster:

1. Perform historic treatment of plaster under quantity allowances and only as authorized. Authorized work includes work required by Drawings and Specifications and work as directed in writing by Architect.
2. Notify Architect weekly of extent of work performed that is attributable to quantity allowances.
3. Perform work that exceeds quantity allowances only as authorized by Change Orders.

B. Historic plaster repair and replacement is part of historic plaster repair allowance unless otherwise indicated.

1.4 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

1. Review minutes of Preliminary Historic Treatment Conference that pertain to historic treatment of plaster.
2. Review methods and procedures related to historic treatment of plaster including, but not limited to, the following:

a. Verify historic treatment specialist's personnel, equipment, and facilities needed to make progress and avoid delays.
b. Materials, material application, colors, patterns, and sequencing.
c. Fire-protection plan.
d. Plasterwork historic treatment program.
e. Coordination with building occupants.

1.5 SEQUENCING AND SCHEDULING

A. Perform historic treatment of plaster in the following sequence, which includes work specified in this and other Sections:

1. Dismantle existing surface-mounted objects and hardware that overlie plaster surfaces except items indicated to remain in place. Tag items with location identification and protect.
2. Verify that temporary protections have been installed.
3. Examine condition of plaster surfaces.
4. Clean plaster surface and remove paint and other finishes to the extent required.
5. Repair and replace existing plaster and supports to the degree required for a uniform, tightly adhered surface on which to paint or apply other finishes.
6. Cure repaired surfaces and allow them to dry for proper finishing.
7. Paint and apply other finishes.
8. Reinstall dismantled surface-mounted objects and hardware unless otherwise indicated.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

1. Include recommendations for product application and use.

B. Shop Drawings: For each configuration of new or replicated plaster molding and ornament required for the work.

1. Include plans, elevations, and sections that show locations and extent of work.
2. Show full-size details of configurations, joint locations, and attachments to other work.

C. Samples for Initial Selection: For each exposed product that will be exposed and not be painted or otherwise finished and for each color and texture specified.

D. Samples for Verification: For the following products:

1. Cast Plaster: Each type and form of cast-plaster fabrication.

    a. Patterns for Casting: Before manufacturing cast-plaster fabrications, submit the actual patterns from which molds will be made for casting new units. Package and ship to prevent loss or damage or make patterns available for inspection by Architect at fabrication plant.
    b. Cast-Plaster Fabrications: Provide one unit of each shape and surface design, suitable and ready for installation. Submit unit samples after acceptance of patterns for casting.

2. Linear Moldings: 24-inch long section of each configuration wet-applied molding with finished joint. Show complete pattern and applied nonlinear cast-plaster shapes, if any.
3. Nonlinear Shapes: Full-size unit of each configuration.
4. Wood Lath: 18-inch long section.
5. Metal Lath: 18 inches square.

6. Accessories: Each type in manufacturer's standard size.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified cast-plaster manufacturer, if applicable to the Work.

B. Plasterwork Historic Treatment Program: Submit before work begins.

1.8 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications: A qualified historic plastering specialist with expertise in matching and performing the types of historic plasterwork repairs required. Experience only in installing and repairing new plasterwork, veneer plaster, or gypsum board is insufficient experience for historic treatment work.

B. Cast-Plaster Manufacturer Qualifications: A firm regularly engaged in manufacturing custom-cast plasterwork for building restoration purposes, of same types and of similar size, complexity, and tolerances as those required for the Work.

C. Plasterwork Historic Treatment Program: Prepare a written, detailed description of materials, methods, equipment, and sequence of operations to be used for historic treatment work and protection of surrounding materials and Project site.

1. Include methods and procedures to protect plastered surfaces from damage caused by construction operations, including, but not limited to, exposure to moisture, vibration, mechanical damage, and soiling.
2. If materials and methods other than those indicated are proposed for any phase of historic treatment work, add a written description of such materials and methods, including evidence of successful use on comparable projects, and demonstrations to show their effectiveness for this Project.

1.9 DELIVERY, STORAGE, AND HANDLING

A. Deliver packaged materials to Project site in manufacturer's original and unopened containers, labeled with manufacturer's name and type of products.

B. Store materials on elevated platforms, under cover, and in a dry location with ambient temperatures continuously maintained at not less than 45 deg F.

C. Store hydrated lime and factory-prepared lime putty in manufacturer's original and unopened containers. Discard lime if containers have been damaged or have been opened for more than two days.

D. Store materials not in use in tightly covered containers.

E. Store lime putty covered with water in sealed containers.

F. Store sand where grading and other required characteristics can be maintained and contamination avoided.

G. Handle cast-plaster fabrications to prevent overstressing, chipping, defacement, and other damage.

1.10 FIELD CONDITIONS

A. Comply with plaster-material manufacturers' written instructions. For gypsum plaster, also comply with ASTM C842 requirements.

B. Temperatures: Maintain temperatures in work areas at not less than 55 deg F or greater than 80 deg F for at least seven days before application of plaster, continuously during application, and for seven days after plaster has set or until plaster has dried.

C. Conditioning: Acclimatize cast-plaster fabrications to ambient temperature and humidity of spaces in which they are installed. Remove packaging and move units into installation spaces not less than 48 hours before installing them.

D. Field Measurements: Where cast-plaster fabrications are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication and indicate measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

E. Avoid conditions that result in plaster drying out too quickly.

1. Distribute heat evenly; prevent concentrated or uneven heat on plaster.
2. Maintain relative humidity levels for prevailing ambient temperature that produce normal drying conditions.
3. Ventilate work areas in a manner that prevents drafts of air from contacting surfaces during plaster application and until plaster is dry.

1.11 REUSABLE PLASTER MOLDS AND PATTERNS

A. On completion of the manufacturing of cast units, deliver one unused mold and pattern of each shape and size of unit delivered to Project site. Deliver to a location and at a time determined by Owner, to become Owner's property.

B. Identify each piece whether it was sized for casting lime- or gypsum-plaster fabrications and where the fabrications were used.

C. Have molds delivered carefully packed; protected from dirt, moisture, and breakage; so as to arrive in usable, undamaged condition and enable long-term storage and possible future use.

PART 2 - PRODUCTS

2.1 LIME-PLASTER MATERIALS

A. Hydrated Lime: ASTM C206, Type S.

B. Lime Putty: factory-prepared lime putty according to ASTM C1489.

C. Sand Aggregates: ASTM C897.

1. Finish-Coat Sand: Match size, texture, and gradation of existing sand as closely as possible. Blend several sands if necessary to achieve suitable match.

D. Pigments for Colored Plaster: ASTM C979/C979M and having a record of satisfactory performance in lime plaster.

E. Fiber: 1/2 to 1 inch in length; composed of cattle, goat, or hog hair or body hair from horses, natural linen, cotton, hemp, or jute fiber or alkali-resistant glass or polypropylene fiber; free of grease, waxes, and oils; and beaten well to separate fibers before blending into unfibered plaster material.

1. Proportion of Fiber to Unfibered Plaster Material: 3.5 oz./cu. ft. of unfibered plaster material adjusted as required to produce a well-fibered, cohesive, spreadable, stiff mix with fibers uniformly distributed.

F. Fabric Reinforcing: Coarse, open-weave, sackcloth made of natural linen, cotton, hemp, or jute; free of grease and oils orCoarse, open-weave, alkali-resistant fiberglass or polypropylene fabric; free of grease, waxes, and oils.

2.2 GYPSUM PLASTER MATERIALS

A. Gypsum Materials:

1. Lightweight Gypsum Ready-Mixed Plaster: ASTM C28/C28M, with mill-mixed perlite aggregate.
2. Gypsum Neat Plaster: ASTM C28/C28M for use with job-mixed aggregates.
3. Gypsum Wood-Fibered Plaster: ASTM C28/C28M.
4. High-Strength Gypsum Neat Plaster: ASTM C28/C28M; with a minimum, average, dry compressive strength of 2800 psi per ASTM C472 for a mix of 100 lb of plaster and 2 cu. ft. of sand.
5. Gypsum Gaging Plaster. ASTM C28/C28M.
6. High-Strength Gypsum Gaging Plaster: ASTM C28/C28M; with a minimum, average, dry compressive strength of 5000 psi per ASTM C472 for a neat mix.
7. Gypsum Ready-Mixed Finish Plaster: ASTM C28/C28M; manufacturer's standard, mill-mixed, gaged, interior finish.
8. Gypsum Keene's Cement: ASTM C61/C61M.

B. Hydrated Lime: ASTM C206, Type S.

C. Aggregates:

1. Aggregate for Base-Coat Plasters: ASTM C35, sand.
2. Aggregate for Float Finishes: ASTM C35, sand; graded per ASTM C842.

D. Fiber: 1/2 to 1 inch in length; composed of cattle, goat, or hog hair or body hair from horses, natural linen, cotton, hemp, or jute fiber or glass or polypropylene fiber; free of grease, waxes, and oils; and beaten well to separate fibers before blending into unfibered plaster material.

1. Proportion of Fiber to Unfibered Plaster Material: 3.5 oz./cu. ft. of unfibered plaster material, adjusted as required to produce a well-fibered, cohesive, spreadable, stiff mix with fibers uniformly distributed.

A. Fabric Reinforcing: Coarse, open-weave, sackcloth made of natural linen, cotton, hemp, or jute; free of grease and oils orCoarse, open-weave, alkali-resistant fiberglass or polypropylene fabric; free of grease, waxes, and oils.

B. Bonding Compound: ASTM C631.

2.3 LATH

A. Wood Lath: 1/4 inch by 1-1/4 inch sound, straight-grained, wood strips

B. Metal Lath:

1. Expanded-Metal Lath: ASTM C847, cold-rolled carbon-steel sheet, ASTM A653/A653M, G60, hot-dip galvanized zinc coated.

a. Paper Backing: Kraft paper factory bonded to back of lath.
b. Diamond-Mesh Lath: Self-furring, 2.5 lb/sq. yd.

2.4 TRIM ACCESSORIES

A. General: According to **ASTM C1063 for lime plaster and ASTM C841 for gypsum plaster**; coordinate depth of trim and accessories with thicknesses and number of plaster coats required.

B. Metal Accessories:

1. Cornerite: Fabricated from expanded-metal lath with ASTM A653/A653M, G60, hot-dip galvanized zinc coating.
2. Striplath: Fabricated from expanded-metal lath with ASTM A653/A653M, G60, hot-dip galvanized zinc coating.
3. Cornerbeads: Fabricated from zinc or zinc-coated (galvanized) steel.

a. Small nose cornerbead with expanded flanges; use unless otherwise indicated.
b. Small nose cornerbead with perforated flanges; use on curved corners.
c. Small nose cornerbead with expanded flanges reinforced by perforated stiffening rib; use on columns and for finishing unit masonry corners.

d. Bull nose cornerbead, radius of 3/4 inch minimum, with expanded flanges; use at locations indicated on Drawings.

4. Casing Beads: Fabricated from zinc or zinc-coated (galvanized) steel; square-edged style; with expanded flanges.
5. Control Joints: Fabricated from zinc or zinc-coated (galvanized) steel; one-piece-type, folded pair of unperforated screeds in M-shaped configuration; with perforated flanges and removable protective tape on plaster face of control joint.
6. Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; folded pair of unperforated screeds in M-shaped configuration; with expanded flanges.
7. Two-Piece Expansion Joints: Fabricated from zinc or zinc-coated (galvanized) steel; formed to produce slip-joint and square-edged reveal that is adjustable from 1/4 to 5/8 inch wide; with perforated flanges.

2.5 MISCELLANEOUS MATERIALS

A. Water for Mixing and Finishing Plaster: Potable and free of substances capable of affecting plaster set or of damaging plaster, lath, or accessories.

B. Fasteners for Attaching Lath to Substrates:

1. For Lime Plaster: ASTM C1063.
2. For Gypsum Plaster: ASTM C841.
3. For Wood Lath: ASTM C841 requirements for wood-floor-runner or wood-furring fasteners unless otherwise indicated on Drawings.

C. Wire Ties: ASTM A641/A641M, Class 1 zinc coating, soft temper, not less than 0.0475-inch diameter, unless otherwise indicated.

D. Plaster-Stabilization Materials: Acrylic emulsion(s) and related installation products shall have proven effectiveness in reattaching delaminated plaster and shall have been used previously by historic treatment specialist with successful results.

1. Acrylic Emulsion(s), General: Aqueous emulsion(s) of acrylic polymer, adhesive to plaster and plaster substrates, nontoxic, and non-reemulsifiable after curing.
2. Prewet Solution: Low-viscosity acrylic emulsion.
3. Adhesive: Thickened acrylic emulsion; thickener as recommended in writing by resin manufacturer and historic treatment specialist.

E. Other Products: Select materials and methods of use based on the following, subject to approval of a mockup:

1. Previous effectiveness in performing the work involved.
2. Little possibility of damaging exposed surfaces.
3. Consistency of each application.
4. Uniformity of the resulting overall appearance.
5. Do not use products or tools that could do the following:

a. Remove, alter, or in any way harm the present condition or future preservation of existing surfaces, including surrounding surfaces not in contract.
b. Leave an unintended residue on surfaces.

2.6 CAST-PLASTER FABRICATIONS

A. General: Fabricate cast-plaster units with uniformly finished surfaces and sharply defined details; repair hollows, voids, scratches, and other surface imperfections.

1. Fabricate units of sizes and shapes to match similar existing plasterwork unless otherwise indicated.
2. Fabricate units in lengths and sizes that minimize number of joints between abutting units unless otherwise indicated.
3. Configure joints between units so that they may be finished flush or otherwise concealed inconspicuously.
4. Maximum deviation from true line, size, or shape shall be 1/16 inch noncumulative.

B. Composition: Fabricate units from lime- and gypsum-plaster materials. Reinforce units with fiber or fabric reinforcing as appropriate.

1. Plaster Face: Molding plaster with or without aggregate as is standard with manufacturer for required surface finish.
2. Plaster Backup: Molding plaster with or without aggregate, but with high-proportion of plaster-saturated fiber or fabric reinforcing as is standard with manufacturer.

C. Thickness: Not less than 3/16-inch thickness of plaster material at any point, except for surface-applied, fine plaster tracery as indicated on Drawings.

D. Finish: Smooth for paint finish or as appropriate to Match Existing Conditions.

E. Embedments: Incorporate manufacturer's standard embedments for attaching units to supporting elements unless otherwise indicated. Place embedments to develop the full strength of cast-plaster fabrications. Cover embedments with not less than 3/16-inch thickness of reinforced plaster material.

F. Joint-Treatment Materials: As recommended in writing by manufacturer.

PART 3 - EXECUTION

3.1 HISTORIC TREATMENT OF PLASTER, GENERAL

A. Historic Treatment Appearance Standard: Completed work is to have a uniform appearance as viewed by Architect from building interior at 5 feet away from surface and from building exterior at 20 feet away from surface.

B. General: In treating historic plaster, disturb it as minimally as possible and as follows unless otherwise indicated:

1. Dismantle loose, damaged, or deteriorated plaster, lath, and support systems that cannot be repaired.
2. Verify extent of plaster deterioration against that indicated on Drawings. Consult Architect on types and extent of required work.
3. Verify that substrate surface conditions are suitable for repairs.
4. Provide lath, furring, and support systems for plaster included in the work of this Section.
5. Replace lost details in new, wet-applied and cast plaster that replicate existing or indicated plaster configurations.
6. Leave repaired plasterwork in proper condition for painting or applying other finishes as indicated.
7. Install temporary protective measures to protect historic surfaces that shall be treated later.

C. Illumination: Perform plastering work with adequate, uniform illumination that does not distort the flatness or curvature of surfaces.

3.2 EXAMINATION

A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for substrate and environmental conditions, installation tolerances, and other conditions affecting performance of the Work.

1. If existing substrates cannot be prepared to an acceptable condition for plastering work, notify Architect in writing.
2. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.

B. Masonry Substrates: Verify that mortar joints are struck flush. Notify Architect of undocumented masonry substrate without flush joints. Proceed with plastering as directed by Architect.

C. Begin historic plastering work only after unsatisfactory conditions have been corrected.

3.3 PREPARATION FOR PLASTERING

A. Substrates: Prepare according to plaster manufacturer's written instructions and as follows:

1. Clean surfaces to remove dust, loose particles, grease, oil, incompatible curing compounds, form-release agents, and other foreign matter and deposits that could impair bond with plaster.
2. Remove ridges and protrusions greater than 1/8 inch and fill depressions greater than 1/4 inch with patching material. Allow to set and dry.

3.4 PLASTER REMOVAL AND REPLACEMENT, GENERAL

A. Dismantle plaster that is damaged or deteriorated to the limits indicated. Carefully dismantle areas along straight edges that lie over supports, without damaging surrounding plasterwork.

B. Maintain lath and supporting members in an undamaged condition so far as practicable. Dismantle damaged lath and supports that cannot be repaired or resecured and replace with new work of same type.

C. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.

D. Do not deviate more than plus or minus 1/8 inch in 10 feet from a true plane in finished plaster surfaces, as measured by a 10-foot straightedge placed on surface.

E. Clean substrate surfaces to remove grease, waxes, oils, waterborne staining, debris, and other foreign matter and deposits that could impair bond with repair material.

F. Wet wood lath, masonry and concrete bases before plaster application. Keep substrate damp to the touch but without visible water droplets.

G. Wet remaining plaster abutting the replacement plaster before installing new plasterwork.

H. Finish plaster flush with metal frames and other built-in metal items or accessories that act as a plaster ground unless otherwise indicated. Where casing bead does not terminate plaster at metal frame, cut base coat free from metal frame before plaster sets and groove finish coat at junctures with metal.

I. Provide plaster surfaces that are ready to receive field-applied finishes indicated.

3.5 FLAT LIME-PLASTER REMOVAL AND REPLACEMENT

A. General: Dismantle deteriorated plaster to existing sound plaster at locations indicated on Drawings.

1. Inspect for lath deterioration. If any, replace lath.
2. Sand bonding surfaces of repair area, and clean the surface with a nonmetallic bristle brush.
3. Wet substrate to damp condition, but without visible water droplets, then install new plaster to original profiles.

3.6 FLAT GYPSUM-PLASTER REMOVAL AND REPLACEMENT

A. General: Dismantle deteriorated plaster to existing sound plaster at locations indicated on Drawings. Use replacement plaster mixes of gypsum, lime, and aggregate; and application according to ASTM C842 unless otherwise indicated.

1. Inspect for lath deterioration. If any, replace lath.
2. Sand bonding surfaces of repair area and clean the surface with a nonmetallic bristle brush.
3. Wet substrate to damp condition, but without visible water droplets, then install new plaster to original profiles.

3.7 CAST-PLASTER REMOVAL AND REPLACEMENT

A. Is damaged or deteriorated at locations indicated on Drawings. Carefully dismantle whole cast units from joint to joint, without damaging surrounding plasterwork.

1. Coordinate removal and installation of cast plaster with other plaster repair and installation work.
2. Inspect for deterioration of supporting plaster and lath, and repair or replace deteriorated material as required for a sound substrate.
3. Maintain lath and supporting members in an undamaged condition so far as practicable. Dismantle damaged lath and supports that cannot be repaired or resecured and replace with new work of same type.
4. Sand repair bonding surfaces and clean the surface with a nonmetallic bristle brush.
5. Wetting Substrate: Wet to damp condition, but without visible water droplets.

B. Replacement Material: Replace cast lime-plaster fabrications in kind or with cast gypsum-plaster fabrications. Replace cast gypsum-plaster fabrications with cast gypsum-plaster fabrications.

C. Adhering Cast Plaster: Wet the substrate in replacement area and affix cast plaster using finish-coat plaster for smooth-troweled finish as adhesive. Support units until adhesive can fully support weight of plaster. Remove excess adhesive.

D. Install cast-plaster fabrications level, plumb, true, and aligned with adjacent materials and ready to receive required finishes. Use concealed shims secured with wet plaster where required for alignment.

1. Install replacement, cast-plaster units into bonding and coursing pattern of existing units. Maintain articulated joint widths, if any, between units to match existing joints.
2. Finish nonarticulated joints with joint-treatment materials so that they are flush or otherwise concealed inconspicuously.
3. Where cast-plaster units are joined to form composite fabrications, join units inconspicuously and as recommended in writing by manufacturer.
4. Repair hollows, voids, scratches, and other surface imperfections on units.

E. Hairline cracking within the plaster or plaster separation at edge of a replacement is unacceptable. Completely dismantle such work and reinstall or repair as a crack repair as directed by Architect.

3.8 REMOVING AND INSTALLING LATH AND ACCESSORIES

A. General: Dismantle existing plaster as necessary to expose deteriorated or rusted lath, wire ties, and support system, back to firm substrates and supports. Repair with new materials, well secured to existing lath in good condition and to building structure.

1. Cutting: Cut lath so it can be taken out completely from one support to the next. Cut to avoid cracking surrounding plaster.

2. Cut out existing base-coat plaster beyond the edges of the new lath to permit new plaster to extend onto the old lath. Then step subsequent plaster coats to permit new plaster to extend over the old material.
3. Fasten new lath to support system and to good existing lath. Wire tie at least every 6 inches.
4. Install new lath according to ASTM C1063 for lime plaster and ASTM C841 for gypsum plaster.

B. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.

C. Wood Lath: Install wood lath in same orientation and spacing as remaining wood lath and with lath ends supported by furring or framing. Stagger ends of adjacent laths over different supports, not aligned, and secure with fasteners at each end and spaced a maximum of 24 inches o.c. into supports.

D. Metal Lath: Install according to ASTM C1063 for lime plaster and ASTM C841 for gypsum plaster.

1. Partition Framing and Vertical Furring: Install lath type as appropriate for existing condition.
2. Flat-Ceiling and Horizontal Framing: Install lath type as appropriate for existing condition.
3. Curved-Ceiling Framing: Install flat diamond-mesh lath.
4. On Solid Surfaces, Not Otherwise Furred: Install self-furring, diamond-mesh lath.

3.9 PATCH-TYPE REPAIR

A. General: Patch voids, fractured surfaces, and crushed areas in otherwise sound plaster that are larger than cracks at locations indicated on Drawings and where new work necessitates.

1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
2. Inspect for deterioration of supporting plaster and lath, and repair or replace deteriorated material as required for a sound substrate.
3. Rake perimeter of hole to sound plaster, and slightly undercut existing plaster to enable replacement plaster to tuck behind existing plaster.
4. Replace missing lath in kind. Bridge gaps in wood lath with expanded-metal lath, overlapping wood by 6 inches and fastening them together.
5. Clean hole to remove loose materials and other foreign matter and deposits that could impair bond with repair material. Where grease, waxes, oils, waterborne staining, or other foreign matter and deposits that could impair bond with repair material have penetrated into the plaster, enlarge the hole to remove these deposits.
6. Wet substrate to damp condition, but without visible water droplets, then install patch material to original profiles.
7. Maintain adjacent plasterwork in an undamaged condition so far as practicable.

B. Finishing: Finish flat surfaces flush and with same texture as adjacent existing plaster. For molded plaster shapes, tool surface to restore the sharp edges and the shape of the molded shape to original contours.

C. Hairline cracking within the plaster or plaster separation at edge of a patch is unacceptable. Completely dismantle such work and reinstall or repair.

3.10 HAIRLINE CRACK REPAIR

A. General: Repair cracks 1/32 inch in width or narrower in otherwise sound plaster at locations indicated on Drawings or where new work necessitates.

1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
2. Maintain adjacent plasterwork in an undamaged condition so far as practicable.

B. Existing Topcoat: Open crack in existing topcoat to at least 1/8 inch in width and check for broken fiber reinforcement in base coats.

C. Existing Base Coats: Do not open crack wider in existing base coats unless inspection or other indication shows that the fiber reinforcement has broken. Where inspections indicate failure of fiber reinforcement, proceed as for a large crack repair, but only for length of crack with broken fiber reinforcement.

D. Clean out crack to remove loose materials and other foreign matter and deposits that could impair bond with repair material. Where grease, waxes, oils, waterborne staining, or other foreign matter and deposits that could impair bond with repair material have penetrated into the topcoat plaster, widen the crack and sand surface of the exposed basecoat to remove these deposits.

E. Wet substrate to damp condition, but without visible water droplets.

F. Force finish-coat plaster without aggregate into crack, filling crack to original plaster profile.

G. Finishing: Finish flat surfaces flush and with same texture as adjacent existing plaster. For molded plaster shapes, tool surface to restore the sharp edges and the shape of the molded shape to original contours.

3.11 LARGE CRACK REPAIR

A. General: Repair cracks over 1/32 inch in width in otherwise sound plaster at locations indicated on Drawings and where new work necessitates.

1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
2. Maintain adjacent plasterwork in an undamaged condition so far as practicable.

B. Open crack to at least 1/8 inch in width and full depth with V-groove tool, and check for bond separation or lath deterioration.

C. Abrade side surfaces of crack and remove inner crack debris by gouging (keying) the inside area of the crack.

D. Clean out crack to remove loose materials and other foreign matter and deposits that could impair bond with repair material. Where grease, waxes, oils, waterborne staining, or other foreign matter and deposits that could impair bond with repair material have penetrated into the plaster, widen the crack to remove these deposits.

E. Wet substrate to damp condition, but without visible water droplets.

F. Install finish-coat plaster to fill crack to original plaster profile.

G. Finishing: Finish flat surfaces flush and with same texture as adjacent existing plaster. For molded plaster shapes, tool surface to restore the sharp edges and the shape of the molded shape to original contours.

H. Offset Cracks: If the crack is offset in surface plane by more than 1/8 inch, dismantle the plaster on each side of the crack, a minimum width of 6 inches and down to the lath or other substrate. Then, repair as specified for flat-plaster removal and replacement.

3.12 REATTACHMENT OF DELAMINATED PLASTER

A. General: Reattach plaster that has detached from its wooden lath at locations indicated on Drawings and where new work necessitates.

1. Notify Architect of undocumented detrimental conditions including cracks, bulges, loose backup, rotted wood, rusted metal, and other deteriorated items.
2. Maintain adjacent plasterwork in an undamaged condition so far as practicable.

B. Verify extent of detachment of plaster that has not yet fallen by tapping on plaster surface and evaluating the hollow or solid resonance.

C. Protect floors from spillage and debris in the vicinity of work. Use materials resistant to the passage of fluids used in work.

D. Drill 1/4-inch injection ports (holes) through the plaster spaced 3 to 6 inches apart over surface of detached plaster. Dislodge loose plaster particles, and vacuum debris from holes.

E. Prewet injection ports, gaps at edges of lost plaster, back of plaster, and wooden lath with prewet solution.

F. Inject adhesive into ports, enough to fill gaps between detached plaster and lath, and inject into gaps at edges of lost plaster.

G. Clean off excess and smeared adhesive while wet.

H. Apply temporary battens over surface of treated plaster to prevent further separation during repair work. Secure battens in place against plaster with screws through the battens and plaster and into the wood lath or braces supported from floor below.

I. Maintain temporary battens in place for a week or more, allowing adhesive to coalesce and dry.

J. Remove battens, patch holes and missing plaster, and repair cracks.

3.13 INSTALLATION TOLERANCES

A. Completed plaster installation shall not deviate from a true plane by more than **1/8 inch** as measured by a 5-foot straightedge placed at any location on a surface, except where existing plaster is retained as a substrate for new plasterwork.

3.14 CLEANING AND PROTECTION

A. Protect work of other trades against damage. Promptly remove plaster from surfaces not indicated to be repaired or plastered. Do not scratch or damage finished surfaces.

B. Repair floors, walls, and other surfaces stained, marred, or otherwise damaged during plastering.

C. Correct damage to other historic surfaces and to new work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

D. Remove temporary protection and enclosure of other work.

END OF SECTION

SECTION 090391 - HISTORIC TREATMENT OF PLAIN PAINTING

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes historic treatment of plain painting as follows:

1. Removing existing paint.
2. Repairing substrates.
3. Plain painting of historic surfaces**,** including staining and varnishing of historic wood.

1.2 UNIT PRICES

A. Work of this Section is affected by unit prices specified in Section 012200 "Unit Prices."

1.3 DEFINITIONS

A. Gloss Level 1: Not more than 5 units at 60 degrees and 10 units at 85 degrees, according to ASTM D523.

B. Gloss Level 2: Not more than 10 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

C. Gloss Level 3: 10 to 25 units at 60 degrees and 10 to 35 units at 85 degrees, according to ASTM D523.

D. Gloss Level 4: 20 to 35 units at 60 degrees and not less than 35 units at 85 degrees, according to ASTM D523.

E. Gloss Level 5: 35 to 70 units at 60 degrees, according to ASTM D523.

F. Gloss Level 6: 70 to 85 units at 60 degrees, according to ASTM D523.

G. Gloss Level 7: More than 85 units at 60 degrees, according to ASTM D523.

H. Modern Paint Materials: Paint materials not designed to match historic paint formulations but that may be required to match historic paint colors.

I. Plain Painting: For historic treatment, this means painting that requires attention to historic treatment requirements, but no special, decorative or artistic painting skill.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Sustainable Design Submittals:

1. Paint is required to meet standards for USGBC LEED. Provide EPD and Product Data indicating conformance.

C. Samples: For each type of paint system and each color and gloss.

1. For each painted color being matched to field condition.
2. Label each Sample for location and application.

D. Product List: Printout of current MPI's "MPI Approved Products List" for each MPI-product category specified in paint systems that will be used in the job, with the proposed product highlighted. Include a schedule indicating the location(s) where each type of primer, paint or other coating will be applied.

1.5 INFORMATIONAL SUBMITTALS

A. Color Matching Certificate: For computer color matching of historic colors.

1.6 QUALITY ASSURANCE

A. Historic Treatment Specialist Qualifications: A qualified historic painting specialist with expertise in matching and touching up existing painting. Experience only in new painting work is insufficient experience for historic treatment work.

B. Color Matching: Custom computer-match paint colors to colors indicated based on field samples at all applicable locations.

PART 2 - PRODUCTS

2.1 PREPARATORY CLEANING MATERIALS

A. Water: Potable.

B. Hot Water: Water heated to a temperature of 140 to 160 deg F (60 to 71 deg C).

C. Detergent Solution: Solution prepared by mixing 2 cups of tetrasodium pyrophosphate (TSPP), 1/2 cup of laundry detergent that contains no ammonia, 5 quarts of 5 percent sodium hypochlorite bleach, and 15 quarts of warm water for every 5 gal. of solution required.

D. Mildewcide: Commercial proprietary mildewcide or a job-mixed solution prepared by mixing 1/3 cup of household detergent that contains no ammonia, 1 quart of 5 percent sodium hypochlorite bleach, and 3 quarts of warm water.

E. Abrasives for Ferrous Metal Cleaning: Aluminum oxide paper, emery paper, fine steel wool, steel scrapers, and steel-wire brushes of various sizes.

F. Rust Remover: Manufacturer's standard phosphoric acid-based gel formulation, also called "naval jelly," for removing corrosion from iron and steel.

2.2 PAINT REMOVERS

A. Low-Odor, Solvent-Type Paste Paint Remover: Manufacturer's standard low-odor, water-rinsable, solvent-type paste, gel, or foamed emulsion formulation for removing paint from masonry, stone, wood, plaster, or metal as required to suit Project; and containing no methanol or methylene chloride.

2.3 PAINT, GENERAL

A. Material Compatibility:

1. Provide materials for use within each paint system that are compatible with one another and substrates indicated, under conditions of service and application as demonstrated by manufacturer, based on testing and field experience.
2. For each coat in a paint system, provide products recommended in writing by manufacturers of topcoat for use in paint system and on substrate indicated.

B. Colors: Match adjacent finish, will vary potentially at each door.

2.4 MODERN PAINT MATERIALS, GENERAL

A. MPI Standards: Provide products that comply with MPI standards indicated and that are listed in its "MPI Approved Products List."

B. Transition Coat: Paint manufacturer's recommended coating for use where a residual existing coating is incompatible with the paint system.

C. Low-VOC: Meet LEED requirements (generally MPI E3 VOC Ranges).

2.5 MODERN PAINT MATERIAL MANUFACTURERS

A. Sherwin Williams or equal.

2.6 MODERN PAINT MATERIALS

A. Primers and Sealers:

1. Primer Sealer, Latex, Interior: MPI #50.
2. Primer, Latex, for Interior Wood: MPI #39.
3. Primer Sealer, Alkyd, Interior: MPI #45.
4. Undercoat, Enamel, Interior: MPI #46.
5. Primer, Stain Blocking, Water Based: MPI #137.
6. Alkyd, Sanding Sealer, Clear: MPI #102.

7. Shellac: MPI #88.
8. Stain, Semi-Transparent, for Interior Wood: MPI #90.

B. Metal Primers:

1. Primer, Metal, Surface Tolerant: MPI #23.
2. Primer, Alkyd, Anti-Corrosive for Metal: MPI #79.
3. Primer, Rust-Inhibitive, Water Based: MPI #107.

C. Wood Primers:

1. Primer, Latex for Exterior Wood: MPI #6.
2. Primer, Alkyd for Exterior Wood: MPI #5.

D. Water-Based Paints:

1. Latex, Exterior Flat (Gloss Level 1): MPI #10.
2. Latex, Exterior Low Sheen (Gloss Levels 3-4):[MPI #15.
3. Latex, Exterior Semigloss (Gloss Level 5): MPI #11
4. Latex, Exterior, Gloss (Gloss Level 6): MPI #119.
5. Latex, Interior, Flat, (Gloss Level 1): MPI #53.
6. Latex, Interior, (Gloss Level 2): MPI #44.
7. Latex, Interior, (Gloss Level 3): MPI #52.
8. Latex, Interior, (Gloss Level 4): MPI #43.
9. Latex, Interior, Semigloss, (Gloss Level 5): MPI #54.
10. Latex, Interior, Gloss, (Gloss Level 6, except Minimum Gloss of 65 Units at 60 Degrees): MPI #114.
11. Latex, Interior, Institutional Low Odor/VOC, Flat (Gloss Level 1): MPI #143.
12. Latex, Interior, Institutional Low Odor/VOC (Gloss Level 2): MPI #144.
13. Latex, Interior, Institutional Low Odor/VOC (Gloss Level 3): MPI #145.
14. Latex, Interior, Institutional Low Odor/VOC (Gloss Level 4): MPI #146.
15. Latex, Interior, Institutional Low Odor/VOC, Semigloss (Gloss Level 5): MPI #147.
16. Latex, Interior, Institutional Low Odor/VOC, Gloss (Gloss Level 6): MPI #148.

E. Solvent-Based Paints:

1. Alkyd, Exterior Flat (Gloss Level 1): MPI #8.
2. Alkyd, Exterior, Semigloss (Gloss Level 5): MPI #94.
3. Alkyd, Exterior Gloss (Gloss Level 6): MPI #9.
4. Alkyd, Interior, Flat (Gloss Level 1): MPI #49.
5. Alkyd, Interior, (Gloss Level 3): MPI #51.
6. Alkyd, Interior, Semigloss (Gloss Level 5): MPI #47.
7. Alkyd, Interior, Gloss (Gloss Level 6): MPI #48.

F. Solvent-Based Varnishes:

1. Varnish, with UV Inhibitor, Exterior, Semigloss (Gloss Level 5): MPI #30.
2. Varnish, with UV Inhibitor, Exterior, Gloss (Gloss Level 6): MPI #29.
3. Varnish, Marine Spar, Exterior, Gloss (Gloss Level 7): MPI #28.
4. Varnish, Interior, Flat (Gloss Level 1): MPI #73.

5. Varnish, Interior, Semigloss (Gloss Level 5): MPI #74.
6. Varnish, Interior, Gloss (Gloss Level 6): MPI #75.

2.7 PATCHING MATERIALS

A. Wood-Patching Compound: Two-part, epoxy-resin, wood-patching compound; knife-grade formulation as recommended in writing by manufacturer for type of wood repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be designed for filling voids in damaged wood materials that have deteriorated due to weathering and decay. Compound shall be capable of filling deep holes and spreading to feather edge.

B. Metal Patching Compound: Two-part, polyester-resin, metal patching compound; knife-grade formulation as recommended in writing by manufacturer for type of metal repair indicated, tooling time required for the detail of work, and site conditions. Compound shall be produced for filling metal that has deteriorated due to corrosion. Filler shall be capable of filling deep holes and spreading to feather edge.

C. Cementitious Patching Compounds: Cementitious patching compounds and repair materials specifically manufactured for filling cementitious substrates and for sanding or tooling prior to repainting; formulation as recommended in writing by manufacturer for type of cementitious substrate indicated, exposure to weather and traffic, the detail of work, and site conditions.

D. Gypsum-Plaster Patching Compound: Finish coat plaster and bonding compound according to ASTM C842 and manufacturer's written instructions.

PART 3 - EXECUTION

3.1 HISTORIC TREATMENT OF PAINTING, GENERAL

A. Execution of the Work: In treating historic items, disturb them as minimally as possible and as follows:

1. Remove failed coatings and corrosion and repaint.
2. Verify that substrate surface conditions are suitable for painting.
3. Allow other trades to repair items in place and retain as much original material as possible before repainting.
4. Install temporary protective measures to protect historic painted surfaces that shall be treated later.

B. Mechanical Abrasion: Where mechanical abrasion is needed for the work, use only the gentlest mechanical methods, such as scraping and lightly hand sanding, that will not abrade softer substrates, reducing clarity of detail. Do not use abrasive methods such as rotary sanding, rotary wire brushing, or power tools except as indicated as part of the historic treatment program and as approved by Architect.

C. Heat Processes: Do not use torches, heat guns, or heat plates.

3.2 EXAMINATION

A. Examine substrates and conditions, with historic treatment specialist present, for compliance with requirements for maximum moisture content and other conditions affecting performance of painting work. Comply with paint manufacturer's written instructions for inspection.

B. Maximum Moisture Content of Substrates: Do not begin application of coatings unless moisture content of exposed surface is below the maximum value recommended in writing by paint manufacturer and not greater than the following maximum values when measured with an electronic moisture meter appropriate to the substrate material:

1. Concrete: 12 percent.
2. Gypsum Board: 12 percent.
3. Gypsum Plaster: 12 percent.
4. Masonry (Clay and CMU): 12 percent.
5. Portland Cement Plaster: 12 percent.
6. Wood: 15 percent.

C. Alkalinity: Do not begin application of coatings unless surface alkalinity is within range recommended in writing by paint manufacturer. Conduct alkali testing with litmus paper on exposed plaster, cementitious, and masonry surfaces.

3.3 PREPARATORY CLEANING

A. General: Use only the gentlest, appropriate method necessary to clean surfaces in preparation for painting. Clean all surfaces, corners, contours, and interstices.

B. Detergent Cleaning: Wash surfaces by hand using clean rags, sponges, and bristle brushes. Scrub surface with detergent solution and bristle brush until soil is thoroughly dislodged and can be removed by rinsing. Use small brushes to remove soil from joints and crevices. Dip brush in solution often to ensure that adequate fresh detergent is used and that surface remains wet. Rinse with water applied by clean rags or sponges.

C. Solvent Cleaning: Use solvent cleaning to remove oil, grease, smoke, tar, and asphalt from painted or unpainted surfaces before other preparation work. Wipe surfaces with solvent using clean rags and sponges. If necessary, spot-solvent cleaning may be employed just prior to commencement of paint application, provided enough time is allowed for complete evaporation. Use clean solvent and clean rags for the final wash to ensure that all foreign materials have been removed. Do not use solvents, including primer thinner and turpentine, that leave residue.

D. Mildew: Clean off existing mildew, algae, moss, plant material, loose paint, grease, dirt, and other debris by scrubbing with bristle brush or sponge and detergent solution. Scrub mildewed areas with mildewcide. Rinse with water applied by clean rags or sponges.

E. Chemical Rust Removal:

1. Remove loose rust scale with approved abrasives for ferrous-metal cleaning.
2. Apply rust remover with brushes or as recommended in writing by manufacturer.

3. Allow rust remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing. Do not allow extended dwell time.
4. Wipe off residue with mineral spirits and either steel wool or soft rags, or clean with method recommended in writing by manufacturer to remove residue.
5. Dry immediately with clean, soft cloths. Follow direction of grain in metal.
6. Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

F. Mechanical Rust Removal:

1. Remove rust with approved abrasives for ferrous-metal cleaning. Clean to bright metal.
2. Wipe off residue with mineral spirits and either steel wool or soft rags.
3. Dry immediately with clean, soft cloths. Follow direction of grain in metal.
4. Prime immediately to prevent rust. Do not touch cleaned metal surface until primed.

3.4 PAINT REMOVAL

A. General: Remove paint where indicated. Where cleaning methods have been attempted and further removal of the paint is required because of incompatible or unsatisfactory surfaces for repainting, remove paint to extent required by conditions.

1. Brushes: Use brushes that are resistant to chemicals being used.

a. Metal Substrates: If using wire brushes on metal, use brushes of same metal composition as metal being treated.
b. Wood Substrates: Do not use wire brushes.

2. Spray Equipment: Use spray equipment that provides controlled application at volume and pressure indicated, measured at nozzle. Adjust pressure and volume to ensure that spray methods do not damage surfaces.

a. Equip units with pressure gages.
b. Unless otherwise indicated, hold spray nozzle at least 6 inches from surface and apply material in horizontal, back-and-forth sweeping motion, overlapping previous strokes to produce uniform coverage.
c. For chemical spray application, use low-pressure tank or chemical pump suitable for chemical indicated, equipped with nozzle having a cone-shaped spray.
d. For water-spray application, use fan-shaped spray tip that disperses water at an angle of 25 to 50 degrees.
e. For heated water-spray application, use equipment capable of maintaining temperature between 140 and 160 deg F at flow rates indicated.

B. Paint Removal with Hand Tools: Remove paint manually using hand-held scrapers, wire brushes, sandpaper, and metallic wool as appropriate for the substrate material. Do not use other methods except as indicated as part of the historic treatment program and as approved by Architect.

C. Paint Removal with Low-Odor, Solvent-Type Paste Paint Remover:

1. Remove loose and peeling paint using water, scrapers, stiff brushes, or a combination of these. Let surface dry thoroughly.
2. Apply thick coating of paint remover to dry, painted surface with natural-fiber cleaning brush, deep-nap roller, or large paintbrush. Apply in one or two coats according to manufacturer's written instructions.
3. Allow paint remover to remain on surface for period recommended in writing by manufacturer or as determined by preconstruction testing.
4. Rinse with hot water applied by low-pressure spray to remove chemicals and paint residue.
5. Use mechanical methods recommended in writing by manufacturer to remove chemicals and paint residue.
6. Repeat process if necessary to remove all paint.

3.5 SUBSTRATE REPAIR

A. General: Repair substrate surface defects that are inconsistent with the surface appearance of adjacent materials and finishes.

B. Wood Substrate:

1. Repair wood defects including dents and gouges more than 1/8 inch in size and all holes and cracks by filling with wood-patching compound and sanding smooth. Reset or remove protruding fasteners.
2. Where existing paint is allowed to remain, sand irregular buildup of paint, runs, and sags to achieve a uniformly smooth surface.

C. Cementitious Material Substrate:

1. General: Repair defects including dents and chips more than 1/4 inch in size and all holes and cracks by filling with cementitious patching compound and sanding smooth. Remove protruding fasteners.
2. New and Bare Plaster: Neutralize surface of plaster with mild acid solution as recommended in writing by paint manufacturer. In lieu of acid neutralization, follow manufacturer's written instruction for primer or transition coat over alkaline plaster surfaces.
3. Concrete, Cement Plaster, and Other Cementitious Products: Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. If surfaces are too alkaline to paint, correct this condition before painting.

D. Gypsum-Plaster and Gypsum-Board Substrates:

1. Repair defects including dents and chips more than 1/8 inch in size and all holes and cracks by filling with gypsum-plaster patching compound and sanding smooth. Remove protruding fasteners.
2. Rout out surface cracks to remove loose, unsound material; fill with patching compound and sand smooth.

E. Metal Substrate:

1. Preparation: Treat repair locations by wire-brushing and solvent cleaning. Use chemical or mechanical rust removal method to clean off rust.
2. Defects in Metal Surfaces: Repair non-load-bearing defects in existing metal surfaces, including dents and gouges more than 1/8 inch deep or 1/2 inch across and all holes and cracks by filling with metal patching compound and sanding smooth. Remove burrs and protruding fasteners.
3. Priming: Prime iron and steel surfaces immediately after repair to prevent flash rusting. Stripe paint corners, crevices, bolts, welds, and sharp edges. Apply two coats to surfaces that are inaccessible after completion of the Work.

3.6 PAINT APPLICATION, GENERAL

A. Prepare surfaces to be painted according to the Surface-Preparation Schedule and with manufacturer's written instructions for each substrate condition.

B. Use appropriate paint type and application as applies to each unique condition. Submit a product data submittal that includes a schedule indicating the location(s) where each type of primer, paint or other coating will be applied.

C. Apply a transition coat over incompatible existing coatings.

D. Metal Substrate: Stripe paint corners, crevices, bolts, welds, and sharp edges before applying full coat. Apply two coats to surfaces that are inaccessible after completion of the Work. Tint stripe coat different than the main coating and apply with brush.

E. Blending Plain Painted Surfaces: When painting new substrates patched into existing surfaces or touching up missing or damaged finishes, apply coating system specified for the specific substrate. Apply final finish coat over entire surface from edge to edge and corner to corner.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: If unclear on best methods. engage paint-remover manufacturer's factory-authorized service representative for consultation and Project-site inspection and provide on-site assistance when requested by Architect.

3.8 CLEANING AND PROTECTION

A. At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

B. Protect work of other trades against damage from paint application. Correct damage to work of other trades by cleaning, repairing, replacing, and refinishing, as approved by Architect, and leave in an undamaged condition.

C. At completion of construction activities of other trades, touch up and restore damaged or defaced painted surfaces.

3.9 SURFACE-PREPARATION SCHEDULE

A. General: Before painting, prepare surfaces for painting according to applicable requirements specified in this schedule.

1. Examine surfaces to evaluate each surface condition according to paragraphs below.
2. Where existing degree of soiling prevents examination, preclean surface and allow it to dry before making an evaluation.
3. Repair substrate defects according to "Substrate Repair" Article.

B. Surface Preparation for MPI DSD 0 Degree of Surface Degradation:

1. Surface Condition: Existing paint film in good condition and tightly adhered.
2. Paint Removal: Not required.
3. Preparation for Painting: Wash surface by detergent cleaning; use solvent cleaning where needed. Roughen or degloss cleaned surfaces to ensure paint adhesion according to paint manufacturer's written instructions.

C. Surface Preparation for MPI DSD 1 Degree of Surface Degradation:

1. Surface Condition: Paint film cracked or broken but adhered.
2. Paint Removal: Scrape by hand-tool cleaning methods to remove loose paint until only tightly adhered paint remains.
3. Preparation for Painting: Wash surface by detergent cleaning; use other cleaning methods for small areas of bare substrate if required. Roughen, degloss, and sand the cleaned surfaces to ensure paint adhesion and a smooth finish according to paint manufacturer's written instructions.

D. Surface Preparation for MPI DSD 2 Degree of Surface Degradation:

1. Surface Condition: Paint film loose, flaking, or peeling.
2. Paint Removal: Remove loose, flaking, or peeling paint film by hand-tool or chemical paint-removal methods.
3. Preparation for Painting: Wash surface by detergent cleaning; use solvent cleaning where needed. Use other cleaning methods for small areas of bare substrate if required. Sand surfaces to smooth remaining paint film edges. Prepare bare cleaned surface to be painted according to paint manufacturer's written instructions for substrate construction materials.

E. Surface Preparation for MPI DSD 3 Degree of Surface Degradation:

1. Surface Condition: Paint film severely deteriorated, obscuring fine architectural detail work because of paint-layer buildup and/or surface indicated to have paint completely removed.
2. Paint Removal: Completely remove paint film by hand-tool or chemical paint-removal methods. Remove rust.
3. Preparation for Painting: Prepare bare cleaned surface according to paint manufacturer's written instructions for substrate construction materials.

F. Surface Preparation for MPI DSD 4 Degree of Surface Degradation:

1. Surface Condition: Missing material, small holes and openings, and deteriorated or corroded substrate.
2. Substrate Preparation: Repair, replace, and treat substrate according to "Substrate Repair" Article.
3. Preparation for Painting: Sand substrate surfaces to smooth remaining paint film edges and prepare according to paint manufacturer's written instructions for substrate construction materials. Remove rust.
4. Painting: Paint as required for MPI DSD 2 degree of surface degradation.

END OF SECTION

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Copper building wire.
2. Connectors and splices.

1.2 ACTION SUBMITTALS

A. Product Data:

1. Copper building wire.
2. Connectors and splices.

B. Product Schedule: Indicate type, use, location, and termination locations.

1.3 INFORMATIONAL SUBMITTALS

A. Field quality-control reports.

PART 2 - PRODUCTS

2.1 COPPER BUILDING WIRE

A. Description: Flexible, insulated and uninsulated, drawn copper current-carrying conductor with an overall insulation layer or jacket, or both, rated 600 V or less.

B. Standards:

1. Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.
2. Conductor and Cable Marking: Comply with wire and cable marking according to UL's "Wire and Cable Marking and Application Guide."

C. Conductors: Copper, complying with ASTM B3 for bare annealed copper and with ASTM B8 or ASTM B496 for stranded conductors.

D. Conductor Insulation:

1. Type THHN and Type THWN-2. Comply with UL 83.

2. Type THW and Type THW-2. Comply with NEMA WC-70/ICEA S-95-658 and UL 83.

2.2 CONNECTORS AND SPLICES

A. Description: Factory-fabricated connectors, splices, and lugs of size, ampacity rating, material, type, and class for application and service indicated; listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and use.

B. Jacketed Cable Connectors: For steel and aluminum jacketed cables, zinc die-cast with set screws, designed to connect conductors specified in this Section.

C. Lugs: One piece, seamless, designed to terminate conductors specified in this Section.

1. Material: Copper.
2. Type: One hole with standard barrels.
3. Termination: Compression.

PART 3 - EXECUTION

3.1 CONDUCTOR MATERIAL APPLICATIONS

A. Branch Circuits:

1. Copper:

a. Solid for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.

3.2 CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS

A. Exposed Branch Circuits, Including in Crawlspaces: Type THHN/THWN-2, single conductors in raceway.

B. Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN/THWN-2, single conductors in raceway.

3.3 INSTALLATION, GENERAL

A. Conceal cables in finished walls, ceilings, and floors unless otherwise indicated.

B. Complete raceway installation between conductor and cable termination points in accordance with Section 260533.13 "Conduits for Electrical Systems" prior to pulling conductors and cables.

C. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

D. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

E. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

F. Support cables according to Section 260529 "Hangers and Supports for Electrical Systems."

G. Complete cable tray systems installation according to Section 260536 "Cable Trays for Electrical Systems" prior to installing conductors and cables.

3.4 CONNECTIONS

A. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A-486B.

B. Make splices, terminations, and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

1. Use oxide inhibitor in each splice, termination, and tap for aluminum conductors.

C. Wiring at Outlets: Install conductor at each outlet, with at least 6 inch (150 mm) of slack.

3.5 IDENTIFICATION

A. Identify and color-code conductors and cables according to Section 260553 "Identification for Electrical Systems."

B. Identify each spare conductor at each end with identity number and location of other end of conductor, and identify as spare conductor.

3.6 SLEEVE AND SLEEVE-SEAL INSTALLATION FOR ELECTRICAL PENETRATIONS

A. Install sleeves and sleeve seals at penetrations of exterior floor and wall assemblies. Comply with requirements in Section 260544 "Sleeves and Sleeve Seals for Electrical Raceways and Cabling."

3.7 FIRESTOPPING

A. Apply firestopping to electrical penetrations of fire-rated floor and wall assemblies to restore original fire-resistance rating of assembly according to Section 078413 "Penetration Firestopping."

END OF SECTION

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Grounding and bonding conductors.
2. Grounding and bonding bushings.

PART 2 - PRODUCTS

2.1 GROUNDING AND BONDING CONDUCTORS

A. Equipment Grounding Conductor:

1. General Characteristics: 600 V, THHN/THWN-2 or THWN-2, copper wire or cable, green color, in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

B. Isolated Equipment Grounding Conductor:

1. General Characteristics: 600 V, THHN/THWN-2 or THWN-2, copper wire or cable, green color with one or more yellow stripes, in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

C. ASTM - Bare Copper Grounding and Bonding Conductor:

1. Referenced Standards: Complying with one or more of the following:

a. Soft or Annealed Copper Wire: ASTM B3.
b. Concentric-Lay Stranded Copper Conductor: ASTM B8.
c. Tin-Coated Soft or Annealed Copper Wire: ASTM B33.

2.2 GROUNDING AND BONDING BUSHINGS

A. Description: Bonding bushings connect conduit fittings, tubing fittings, threaded metal conduit, and unthreaded metal conduit to metal boxes and equipment enclosures, and have one or more bonding screws intended to provide electrical continuity between bushing and enclosure. Grounding bushings have provision for connection of bonding or grounding conductor and may or may not also have bonding screws.

B. Source Limitations: Obtain products from single manufacturer.

C. Performance Criteria:

1. Regulatory Requirements:

    a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

2. Listing Criteria:

    a. Grounding and Bonding Equipment: UL CCN KDER; including UL 467.

D. UL KDER - Bonding Bushing:

1. General Characteristics: Threaded bushing with insulated throat.

E. UL KDER - Grounding Bushing:

1. General Characteristics: Threaded bushing with insulated throat and mechanical-type wire terminal.

PART 3 - EXECUTION

3.1 SELECTION OF GROUNDING AND BONDING PRODUCTS

A. Grounding and Bonding Conductors:

1. Provide solid conductor for 8 AWG and smaller, and stranded conductors for 6 AWG and larger unless otherwise indicated.
2. Custom-Length Insulated Equipment Bonding Jumpers: 6 AWG, 19-strand, Type THHN.
3. Bonding Cable: 28 kcmil, 14 strands of 17 AWG conductor, 1/4 inch in diameter.
4. Bonding Conductor: 4 AWG or 6 AWG, stranded conductor.
5. Bonding Jumper: Copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch wide and 1/16 inch thick.
6. Tinned Bonding Jumper: Tinned-copper tape, braided conductors terminated with copper ferrules; 1-5/8 inch wide and 1/16 inch thick.
7. Underground Grounding Conductors: Install bare copper conductor, 2/0 AWG minimum.

3.2 SELECTION OF GROUNDING AND BONDING PRODUCTS FOR COMMUNICATIONS

A. Comply with Section 271100 "Communications Equipment Room Fittings."

3.3 INSTALLATION OF GROUNDING AND BONDING

A. Comply with manufacturer's published instructions.

B. Special Techniques:

1. Equipment Grounding and Bonding:

a. Install insulated equipment grounding conductors with feeders and branch circuits.
b. Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70:

    1) Feeders and branch circuits.
    2) Receptacle circuits.
    3) Flexible raceway runs.
    4) Armored and metal-clad cable runs.

c. Isolated Grounding Receptacle Circuits: Install insulated equipment grounding conductor connected to receptacle grounding terminal. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of applicable derived system or service unless otherwise indicated.
d. Isolated Equipment Enclosure Circuits: For designated equipment supplied by branch circuit or feeder, isolate equipment enclosure from supply circuit raceway with nonmetallic raceway fitting listed for the purpose. Install fitting where raceway enters enclosure, and install separate insulated equipment grounding conductor. Isolate conductor from raceway and from panelboard grounding terminals. Terminate at equipment grounding conductor terminal of applicable derived system or service unless otherwise indicated.

3.4 PROTECTION

A. After installation, protect grounding and bonding cables and equipment from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

SECTION 260533.13 - CONDUITS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Type EMT-S duct raceways and elbows.
2. Type RTRC-BG duct raceways and fittings.
3. Fittings for conduit, tubing, and cable.
4. Electrically conductive corrosion-resistant compounds for threaded conduit.
5. Solvent cements.

B. Products Installed, but Not Furnished, under This Section:

1. See Section 260553 "Identification for Electrical Systems" for electrical equipment labels.

C. Related Requirements:

1. Section 260519 "Low-Voltage for Electrical Power Conductors and Cables" for nonmetallic underground conduit with conductors (Type NUCC).

1.2 DEFINITIONS

A. Conduit: A structure containing one or more duct raceways.

1.3 ACTION SUBMITTALS

A. Product Data:

1. Type EMT-S duct raceways and elbows.
2. Fittings for conduit, tubing, and cable.
3. Electrically conductive corrosion-resistant compounds for threaded conduit.
4. Solvent cements.

1.4 INFORMATIONAL SUBMITTALS

A. Manufacturers' Published Instructions:

1. Type EMT-S duct raceways and elbows.
2. Fittings for conduit, tubing, and cable.
3. Electrically conductive corrosion-resistant compounds for threaded conduit.
4. Solvent cements.

PART 2 - PRODUCTS

2.1 TYPE EMT-A AND TYPE EMT-SS DUCT RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN FJMX; including UL 797A.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL FJMX - Aluminum Electrical Metal Tubing (EMT-A) and Elbows:

1. Material: Aluminum.
2. Options:

a. Minimum Trade Size: Metric designator 16 (trade size 1/2).

2.2 TYPE EMT-S DUCT RACEWAYS AND ELBOWS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN FJMX; including UL 797.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL FJMX - Steel Electrical Metal Tubing (EMT-S) and Elbows:

1. Material: Steel.
2. Options:

a. Exterior Coating: Zinc.
b. Interior Coating: Zinc with organic top coating.
c. Minimum Trade Size: Metric designator 16 (trade size 1/2).

d. Colors: As indicated on Drawings.

2.3 ELECTRICALLY CONDUCTIVE CORROSION-RESISTANT COMPOUNDS FOR THREADED CONDUIT

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN FOIZ; including UL Subject 2419.

B. Source Quality Control:

1. Product Data: Prepare and submit catalog cuts, brochures, and performance data illustrating size, physical appearance, and other characteristics of product.
2. Manufacturer's Published Instructions: Prepare and submit installation, testing, and operating instructions for product.

C. UL FOIZ - Electrically Conductive Corrosion-Resistant Compound for Threaded Conduit:

PART 3 - EXECUTION

3.1 SELECTION OF CONDUITS FOR ELECTRICAL SYSTEMS

A. Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with NFPA 70 for selection of duct raceways. Consult Architect for resolution of conflicting requirements.

B. Indoors:

1. Exposed and Subject to Physical Damage: EMT. Locations include the following:

a. Locations less than 8 ft above finished floor.
b. Stub-ups to above suspended ceilings.

2. Exposed and Not Subject to Physical Damage: EMT.
3. Concealed in Ceilings and Interior Walls and Partitions: EMT.

C. Duct Fittings: Select fittings in accordance with NEMA FB 2.10 guidelines.

1. ERMC and IMC: Provide threaded-type fittings unless otherwise indicated.

3.2 INSTALLATION OF CONDUITS FOR ELECTRICAL SYSTEMS

A. Comply with manufacturer's published instructions.

B. Reference Standards for Installation: Unless more stringent installation requirements are specified in Contract Documents or manufacturers' published instructions, comply with the following:

1. Type EMT-A: Article 358 of NFPA 70 and NECA NEIS 102.
2. Type EMT-SS: Article 358 of NFPA 70 and NECA NEIS 101.
3. Type EMT-S: Article 358 of NFPA 70 and NECA NEIS 101.
4. Expansion Fittings: NEMA FB 2.40.
5. Consult Architect for resolution of conflicting requirements.

C. Special Installation Techniques:

1. General Requirements for Installation of Duct Raceways:

a. Complete duct raceway installation before starting conductor installation.
b. Provide stub-ups through floors with coupling threaded inside for plugs, set flush with finished floor. Plug coupling until conduit is extended above floor to final destination or a minimum of 2 ft above finished floor.
c. Make bends in duct raceway using large-radius preformed ells except for parallel bends. Field bending must be in accordance with NFPA 70 minimum radii requirements. Provide only equipment specifically designed for material and size involved.
d. Conceal conduit within finished walls, ceilings, and floors unless otherwise indicated. Install conduits parallel or perpendicular to building lines.
e. Support conduit within 12 inch of enclosures to which attached.
f. Install devices to seal duct raceway interiors at accessible locations. Locate seals so no fittings or boxes are between the seal and the following changes of environments. Seal interior of duct raceways at the following points:

1) Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
2) Where an underground service duct raceway enters a building or structure.
3) Conduit extending from interior to exterior of building.
4) Conduit extending into pressurized duct raceway and equipment.
5) Conduit extending into pressurized zones that are automatically controlled to maintain different pressure set points.
6) Where otherwise required by NFPA 70.

g. or electrical items on "explosion-relief" walls or rotating equipment.
h. Do not install conduits within 2 inch of the bottom side of a metal deck roof.
i. Keep duct raceways at least 6 inch away from parallel runs of flues and steam or hot-water pipes. Install horizontal duct raceway runs above water and steam piping.
j. Cut conduit perpendicular to the length. For conduits metric designator 53 (trade size 2) and larger, use roll cutter or a guide to make cut straight and perpendicular to the length. Ream inside of conduit to remove burrs.
k. Install pull wires in empty duct raceways. Provide polypropylene or monofilament plastic line with not less than 200 lb tensile strength. Leave at least 12 inch of slack at both ends of pull wire. Cap underground duct raceways designated as spare above grade alongside duct raceways in use.

l. Install duct raceways square to the enclosure and terminate at enclosures without hubs with locknuts on both sides of enclosure wall. Install locknuts hand tight, plus one-quarter turn more.

1) Termination fittings with shoulders do not require two locknuts.

m. Terminate threaded conduits into threaded hubs or with locknuts on inside and outside of boxes or cabinets. Install bushings on conduits up to metric designator 35 (trade size 1-1/4) and insulated throat metal bushings on metric designator 41 (trade size 1-1/2) and larger conduits terminated with locknuts. Install insulated throat metal grounding bushings on service conduits.

2. Stub-ups to Above Recessed Ceilings:

a. Provide EMT, IMC, or ERMC for duct raceways.
b. Provide a conduit bushing or insulated fitting to terminate stub-ups not terminated in hubs or in an enclosure.

3. Expansion-Joint Fittings:

a. Install in runs of aboveground PVC that are located where environmental temperature change may exceed 30 deg F and that have straight-run length that exceeds 25 ft. Install in runs of aboveground ERMC and EMT conduit that are located where environmental temperature change may exceed 100 deg F and that have straight-run length that exceeds 100 ft.
b. Install type and quantity of fittings that accommodate temperature change listed for the following locations:

1) Indoor Spaces Connected with Outdoors without Physical Separation: 125 deg F temperature change.

c. Install fitting(s) that provide expansion and contraction for at least 0.00041 inch per foot of length of straight run per deg F of temperature change for PVC conduits. Install fitting(s) that provide expansion and contraction for at least 0.000078 inch per foot of length of straight run per deg F of temperature change for metal conduits.
d. Install expansion fittings at locations where conduits cross building or structure expansion joints.
e. Install expansion-joint fitting with position, mounting, and piston setting selected in accordance with manufacturer's published instructions for conditions at specific location at time of installation. Install conduit supports to allow for expansion movement.

4. Duct Raceways Penetrating Rooms or Walls with Acoustical Requirements: Seal duct raceway openings on both sides of rooms or walls with acoustically rated putty or firestopping.
5. Identification: Provide labels for conduit assemblies, duct raceways, and associated electrical equipment.

a. Provide warning signs.

D. Interfaces with Other Work:

1. Coordinate with Section 078413 "Penetration Firestopping" for installation of firestopping at penetrations of fire-rated floor and wall assemblies.
2. Coordinate with Section 260529 "Hangers and Supports for Electrical Systems" for installation of conduit hangers and supports.

3.3 PROTECTION

A. Protect coatings, finishes, and cabinets from damage and deterioration.

1. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
2. Repair damage to PVC coatings or paint finishes with matching touchup coating recommended by manufacturer.

END OF SECTION

SECTION 260544 - SLEEVES AND SLEEVE SEALS FOR ELECTRICAL RACEWAYS AND CABLING

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Round sleeves.
2. Grout.
3. Pourable sealants.
4. Foam sealants.

B. Related Requirements:

1. Section 078413 "Penetration Firestopping" for penetration firestopping installed in fire-resistance-rated walls, horizontal assemblies, and smoke barriers, with and without penetrating items.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 ROUND SLEEVES

A. Steel Wall Sleeves:

1. General Characteristics: ASTM A53/A53M, Type E, Grade B, Schedule 40, zinc coated, plain ends and integral waterstop.

B. Cast-Iron Wall Sleeves:

1. General Characteristics: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.

C. Round, Galvanized-Steel, Sheet Metal Sleeves:

1. General Characteristics: Galvanized-steel sheet; thickness not less than 0.0239 inch; round tube closed with welded longitudinal joint, with tabs for screw-fastening the sleeve to the board.

2.2 GROUT

A. General Characteristics: Nonshrink; recommended for interior and exterior sealing openings in non-fire-rated walls or floors.

1. Standard: ASTM C1107/C1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
2. Design Mix: 5000 psi, 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

2.3 POURABLE SEALANTS

A. Performance Criteria:

1. General Characteristics: Single-component, neutral-curing elastomeric sealants of grade indicated below.

a. Grade: Pourable (self-leveling) formulation for openings in floors and other horizontal surfaces that are not fire rated.

2.4 FOAM SEALANTS

A. Performance Criteria:

1. General Characteristics: Multicomponent, liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam. Foam expansion must not damage cables or crack penetrated structure.
2. Sustainability Characteristics:

PART 3 - EXECUTION

3.1 INSTALLATION OF SLEEVES FOR NON-FIRE-RATED ELECTRICAL PENETRATIONS

A. Sleeves for Conduits Penetrating Above-Grade, Non-Fire-Rated, Concrete and Masonry-Unit Floors and Walls:

1. Interior Penetrations of Non-Fire-Rated Walls and Floors:

a. Seal space outside of sleeves with mortar or grout. Pack sealing material solidly between sleeve and wall or floor so no voids remain. Tool exposed surfaces smooth; protect material while curing.
b. Seal annular space between sleeve and raceway or cable, using joint sealant appropriate for size, depth, and location of joint. Comply with requirements in Section 079200 "Joint Sealants."

2. Use pipe sleeves unless penetration arrangement requires rectangular sleeved opening.

3. Install sleeves for wall penetrations unless core-drilled holes or formed openings are used. Install sleeves during erection of walls. Cut sleeves to length for mounting flush with both surfaces of walls. Deburr after cutting.
4. Install sleeves for floor penetrations. Extend sleeves installed in floors 2 inch above finished floor level. Install sleeves during erection of floors.

B. Sleeves for Conduits Penetrating Non-Fire-Rated Wall Assemblies:

1. Use circular metal sleeves unless penetration arrangement requires rectangular sleeved opening.
2. Seal space outside of sleeves with approved joint compound for wall assemblies.

C. Roof-Penetration Sleeves: Seal penetration of individual raceways and cables with flexible boot-type flashing units applied in coordination with roofing work.

D. Aboveground, Exterior-Wall Penetrations: Seal penetrations using steel pipe sleeves and mechanical sleeve-seal systems. Size sleeves to allow for 1 inch annular clear space between pipe and sleeve for installing mechanical sleeve seals.

E. Underground, Exterior-Wall and Floor Penetrations:

1. Install steel pipe sleeves. Size sleeves to allow for 1 inch annular clear space between raceway or cable and sleeve for installing sleeve-seal system. Grout sleeve into wall or floor opening.

END OF SECTION

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Labels.
2. Extruded insulating tubing.
3. Bands.
4. Tapes and stencils.
5. Tags.
6. Signs.
7. Cable ties.

1.2 ACTION SUBMITTALS

A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 LABELS

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN PGDQ2 for components; including UL 969.

B. UL PGDQ2 - Vinyl Wraparound Labels: Preprinted, flexible labels laminated with clear, weather- and chemical-resistant coating and matching wraparound clear adhesive tape for securing label ends.

C. UL PGDQ2 - Self-Adhesive Wraparound Labels: Preprinted, 3 mil thick, polyester flexible label with acrylic pressure-sensitive adhesive.

1. Self-Lamination: Clear; UV-, weather-, and chemical-resistant; self-laminating, with protective shield over legend. Size labels such that clear shield overlaps entire printed legend.
2. Marker for Labels:

a. Machine-printed, permanent, waterproof, black ink recommended by printer manufacturer.

D. UL PGDQ2 - Self-Adhesive Labels: Polyester, thermal, transfer-printed, 3 mil thick, multicolor, weather- and UV-resistant, pressure-sensitive adhesive labels, configured for intended use and location.

1. Minimum Nominal Size:

a. 1-1/2 by 6 inch for raceway and conductors.
b. 3-1/2 by 5 inch for equipment.
c. As required by authorities having jurisdiction.

2.2 EXTRUDED INSULATING TUBING

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN YDPU2 for components; including UL 224.

B. UL YDPU2 - Heat-Shrink Preprinted Tubes: Flame-retardant polyolefin tubes with machine-printed identification labels, sized to suit diameter and shrunk to fit firmly. Full shrink recovery occurs at maximum of 200 deg F.

2.3 BANDS

A. Snap-Around Labels: Slit, pretensioned, flexible, preprinted, color-coded acrylic sleeves, with diameters sized to suit diameters and that stay in place by gripping action.

B. Snap-Around, Color-Coding Bands: Slit, pretensioned, flexible, solid-colored acrylic sleeves, 2 inch long, with diameters sized to suit diameters and that stay in place by gripping action.

2.4 TAPES AND STENCILS

A. Marker Tapes: Vinyl or vinyl-cloth, self-adhesive wraparound type, with circuit identification legend machine printed by thermal transfer or equivalent process.

B. Self-Adhesive Vinyl Tape: Colored, heavy duty, waterproof, fade resistant; not less than 3 mil thick by 1 to 2 inch wide; compounded for outdoor use.

C. Tape and Stencil: 4 inch wide black stripes on 10 inch centers placed diagonally over orange background and are 12 inch wide. Stop stripes at legends.

2.5 TAGS

A. Metal Tags: Brass or aluminum, 2 by 2 by 0.05 inch, with stamped legend, punched for use with self-locking cable tie fastener.

B. Nonmetallic Preprinted Tags: Polyethylene tags, 0.023 inch thick, color-coded for phase and voltage level, with factory printed permanent designations; punched for use with self-locking cable tie fastener.

C. Write-on Tags:

1. Polyester Tags: 0.015 inch thick, with corrosion-resistant grommet and cable tie for attachment.
2. Marker for Tags:

a. Machine-printed, permanent, waterproof, black ink marker recommended by printer manufacturer.

2.6 CABLE TIES

A. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria: UL CCN ZODZ; including UL 1565 or UL 62275.

B. UL ZODZ - General-Purpose Cable Ties: Fungus inert, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F in accordance with ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black, except where used for color-coding.

C. UL ZODZ - UV-Stabilized Cable Ties: Fungus inert, designed for continuous exposure to exterior sunlight, self-extinguishing, one piece, self-locking, and Type 6/6 nylon.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F in accordance with ASTM D638: 12,000 psi.
3. Temperature Range: Minus 40 to plus 185 deg F.
4. Color: Black.

D. UL ZODZ - Plenum-Rated Cable Ties: Self-extinguishing, UV stabilized, one piece, and self-locking.

1. Minimum Width: 3/16 inch.
2. Tensile Strength at 73 deg F in accordance with ASTM D638: 7000 psi.
3. UL 94 Flame Rating: 94V-0.
4. Temperature Range: Minus 50 to plus 284 deg F.
5. Color: Black.

PART 3 - EXECUTION

3.1 PREPARATION

A. Self-Adhesive Identification Products: Before applying electrical identification products, clean substrates of substances that could impair bond, using materials and methods recommended by manufacturer of identification product.

3.2 SELECTION OF COLORS AND IDENTIFICATION MARKINGS

A. Color-Coding for Phase- and Voltage-Level Identification, 1000 V or Less: Use colors listed below for ungrounded branch-circuit conductors.

1. Color must be factory applied or field applied for sizes larger than 6 AWG when permitted by authorities having jurisdiction.
2. Colors for 208Y/120 V Circuits:

    a. Phase A: Black.
    b. Phase B: Red.
    c. Phase C: Blue.

3. Color for Neutral (Grounded Conductor): White.
4. Color for Equipment Ground: Bare copper, Green, Green with yellow stripe.
5. Color for Isolated Ground: Green with two or more yellow stripes.

B. Color-Coding Raceways, Cable Trays, Junction Boxes, and Conductors for Intrinsically-Safe Circuits: Light blue. When used to identify intrinsically-safe circuits, Article 504 of NFPA 70 requires that the color light blue not be used for any other purpose.

C. Color-Coding Instructional Signs: Self-adhesive labels, including color code for grounded and ungrounded conductors.

D. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

E. Cover Plates: Label individual cover plates with self-adhesive labels. Place label at top of cover plate. Label cover plate with the following information, in the order listed:

1. Panelboard designation.
2. Colon or dash.
3. Branch circuit number.

F. Equipment Identification Labels:

1. Black letters on white field.
2. Indoor Equipment: Self-adhesive label.
3. Equipment to Be Labeled:

a. Racks, Frames, and Enclosures: Identify front and rear of each with self-adhesive labels containing equipment designation.
b. Enclosures and electrical cabinets.
c. Access doors and panels for concealed electrical items.

G. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.3 SELECTION OF SIGNS AND HAZARD MARKINGS

A. Comply with 29 CFR 1910.145 for danger, caution, warning, and safety instruction signs.

B. Signs, labels, and tags required for personnel safety must comply with the following standards:

1. Safety Colors: NEMA Z535.1.
2. Facility Safety Signs: NEMA Z535.2.
3. Safety Symbols: NEMA Z535.3.
4. Product Safety Signs and Labels: NEMA Z535.4.
5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.

C. Warning Labels for Indoor Cabinets, Boxes, and Enclosures for Power and Lighting: Self-adhesive labels.

1. Apply to exterior of door, cover, or other access.
2. For equipment with multiple power or control sources, apply to door or cover of equipment, including, but not limited to, the following:

a. Controls with external control power connections.

3.4 SELECTION OF IDENTIFICATION PRODUCTS FOR COMMUNICATIONS, CONTROL, AUXILIARY, AND LIFE SAFETY SYSTEMS

A. Comply with Section 271100 "Communications Equipment Room Fittings."

3.5 INSTALLATION

A. Install identification materials and devices at locations for most convenient viewing without interference with operation and maintenance of equipment. Install access doors or panels to provide view of identifying devices.

B. Paint: Comply with requirements in painting Sections for paint materials and application requirements. Retain paint system applicable for surface material and location (exterior or interior).

C. Fasteners for Labels and Signs: Self-tapping, stainless steel screws or stainless steel machine screws with nuts and flat and lock washers.

D. Verify and coordinate identification names, abbreviations, colors, and other features with requirements in other Sections requiring identification applications, Drawings, Shop Drawings, manufacturer's wiring diagrams, and operation and maintenance manual. Use consistent designations throughout Project.

E. Install identifying devices before installing acoustical ceilings and similar concealment.

F. Verify identity of item before installing identification products.

G. Coordinate identification with Project Drawings, manufacturer's wiring diagrams, and operation and maintenance manual.

H. Apply identification devices to surfaces that require finish after completing finish work.

I. Install signs with approved legend to facilitate proper identification, operation, and maintenance of electrical systems and connected items.

J. Elevated Components: Increase sizes of labels, signs, and letters to those appropriate for viewing from floor.

K. Vinyl Wraparound Labels:

1. Secure tight to surface of raceway or cable at location with high visibility and accessibility.
2. Attach labels that are not self-adhesive type with clear vinyl tape, with adhesive appropriate to location and substrate.

L. Snap-Around Labels: Secure tight to surface at location with high visibility and accessibility.

M. Self-Adhesive Wraparound Labels: Secure tight to surface at location with high visibility and accessibility.

N. Snap-Around Color-Coding Bands: Secure tight to surface at location with high visibility and accessibility.

O. Heat-Shrink, Preprinted Tubes: Secure tight to surface at location with high visibility and accessibility.

P. Marker Tapes: Secure tight to surface at location with high visibility and accessibility.

Q. Tape and Stencil: Comply with requirements in painting Sections for surface preparation and paint application.

R. Metal Tags:

1. Place in location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

S. Nonmetallic Preprinted Tags:

1. Place in location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

T. Write-on Tags:

1. Place in location with high visibility and accessibility.
2. Secure using general-purpose cable ties.

END OF SECTION

SECTION 262726 - WIRING DEVICES

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. General-grade duplex straight-blade receptacles.

1.2 ACTION SUBMITTALS

A. Product Data:

1. General-grade duplex straight-blade receptacles.

PART 2 - PRODUCTS

2.1 GENERAL-GRADE DUPLEX STRAIGHT-BLADE RECEPTACLES

A. Duplex Straight-Blade Receptacle:

1. Regulatory Requirements:

a. Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.

2. General Characteristics:

a. Reference Standards: UL CCN RTRT and UL 498.

3. Options:

a. Device Color: As indicated on architectural Drawings.
b. Configuration:

1) Heavy-duty, smooth face, NEMA 5-15R.

4. Accessories:

a. Cover Plate: 0.060 inch thick, high-impact thermoplastic (nylon) with smooth finish and color matching wiring device; from same manufacturer as wiring device.
b. Securing Screws for Cover Plate: Metal with head color matching wall plate finish.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Receptacles:

1. Verify that receptacles to be procured and installed for Owner-furnished equipment are compatible with mating attachment plugs on equipment.

3.2 INSTALLATION OF STRAIGHT-BLADE RECEPTACLES

A. Comply with manufacturer's instructions.

B. Reference Standards:

1. Unless more stringent requirements are specified in Contract Documents or manufacturers' instructions, comply with installation instructions in NECA NEIS 130.
2. Mounting Heights: Unless otherwise indicated in Contract Documents, comply with mounting heights recommended in NECA NEIS 1.
3. Receptacle Orientation: Unless otherwise indicated in Contract Documents, orient receptacle to match configuration diagram in NEMA WD 6.

4. Consult Architect for resolution of conflicting requirements.

C. Identification:

1. Identify cover or cover plate for device with panelboard identification and circuit number in accordance with Section 260553 "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL OF STRAIGHT-BLADE RECEPTACLES

A. Tests and Inspections:

1. Insert and remove test plug to verify that device is securely mounted.
2. Verify polarity of hot and neutral pins.
3. Measure line voltage.
4. Measure percent voltage drop.
5. Measure grounding circuit continuity: impedance must be not greater than 2 ohms.
6. Perform additional installation and maintenance inspections and diagnostic tests in accordance with NECA NEIS 130 and manufacturers' instructions.

B. Nonconforming Work:

1. Device will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

3.4 PROTECTION

A. Devices:

1. Schedule and sequence installation to minimize risk of contamination of wires and cables, devices, device boxes, outlet boxes, covers, and cover plates by plaster, drywall joint compound, mortar, cement, concrete, dust, paint, and other materials.
2. After installation, protect wires and cables, devices, device boxes, outlet boxes, covers, and cover plates from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

SECTION 271100 - COMMUNICATIONS EQUIPMENT ROOM FITTINGS

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Communications-circuit accessories.

B. Products Installed, but Not Furnished, under This Section:

1. Section 260526 "Grounding and Bonding for Electrical Systems" furnishes the following installed by this Section:

a. Grounding and bonding conductors.
b. Grounding and bonding bushings.

2. Section 260553 "Identification for Electrical Systems" furnishes labels and warning signs for communications pathways installed by this Section.

1.2 DEFINITIONS

A. Abbreviations for Communications Spaces:

1. EF: Entrance facility; generally, serves campus or building. EF may include an ER.
2. ER: Equipment room; generally, serves campus or building.
3. TE: Telecommunications enclosure; generally, serves a single tenant or floor.
4. TR: Telecommunications room; generally, serves a single tenant or floor.

B. Abbreviations for Communications Facilities:

1. HC: Horizontal cross-connect; also called "floor distributor" (FD).
2. IC: Intermediate cross-connect; also called "building distributor" (BD).
3. MC: Main cross-connect; also called "campus distributor" (CD).

C. Abbreviations for Grounding and Bonding:

1. BBC: Backbone bonding conductor, for connecting multiple TBBs serving the same floor.
2. PBB: Primary bonding busbar; located in main distribution frame room, ideally near electrical service entrance.
3. RBB: Rack bonding busbar; located in equipment cabinets and racks.
4. SBB: Secondary bonding busbar; located in intermediate distribution frame rooms.
5. TBB: Telecommunications bonding backbone, for connecting SBBs to PBB.
6. TBC: Telecommunications bonding conductor, for connecting PBB to intersystem bonding termination device or busbar at electrical service entrance.

7. TEBC: Telecommunications equipment bonding conductor, for connecting RBBs to SBBs or PBB.
8. UBC: Unit bonding conductor, for connecting individual communications equipment to RBBs or SBBs.

1.3 PREINSTALLATION MEETINGS

A. Preinstallation Conference: Conduct conference at Project site.

B. Preinstallation Coordination Meeting(s): For communications equipment room planning. Conduct meeting(s) at Project site before access control equipment installation.

1. Attendees: Representative of Owner's information and communications technology staff that will be installing electronic equipment and cables, installers, fabricators, representatives of manufacturers, and administrants for field tests and inspections. Notify Architect, Construction Manager, and Owner's Commissioning Authority of scheduled meeting dates.

1.4 ACTION SUBMITTALS

A. Shop Drawings:

1. Communications equipment room drawings, diagrams, and supporting documents.

PART 2 - PRODUCTS

2.1 COMMUNICATIONS-CIRCUIT ACCESSORIES

A. Description: This category covers devices intended for connecting communications circuits in accordance with Article 800 of NFPA 70.

B. Performance Criteria:

1. Regulatory Requirements: Listed and labeled in accordance with NFPA 70, by qualified electrical testing laboratory recognized by authorities having jurisdiction and marked for intended location and application.
2. Listing Criteria:

a. For Communications Circuits: UL CCN DUXR; including UL 1863 and UL 467.
b. For Audio/Video, Data, and Signaling Circuits: UL CCN DUXR; including UL 1977 and UL 467.

PART 3 - EXECUTION

3.1 PREPARATION

A. Shop Drawings: Prepare and submit the following:

1. Communications Equipment Room Drawings, Diagrams, and Supporting Documents:

a. Include plans, elevations, sections, details, and attachments to other work.
b. Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
c. Equipment Racks and Cabinets: Indicate workspace requirements and access for cable connections.
d. Grounding and Bonding: Indicate location of busbars and their mounting details showing standoff insulators and wall mounting brackets.
e. Cable Trays, Large Raceways, Ducts, and Piping: Indicate elevation and route of vertical and horizontal cable trays, raceways, or ducts larger than 2 inch wide, and fire-suppression piping located inside communications equipment room.
f. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

3.2 SELECTION OF GROUNDING AND BONDING PRODUCTS FOR COMMUNICATIONS

A. Grounding and Bonding Conductors:

1. Communications Busbar Connections:

a. TBC: Not smaller than 1/0 AWG Insert wire size and no smaller than largest TBB.
b. TBB: Not smaller than 2 kcmil per linear ft of conductor length, but not larger than 750 kcmil, unless otherwise indicated on Drawings.
c. BBC: Not smaller than largest TBB to which it is connected unless otherwise indicated on Drawings.
d. TEBC: Not smaller than 2 AWG unless otherwise indicated on Drawings. Provide bolted connectors.
e. UBC: Not smaller than 6 AWG unless otherwise indicated on Drawings. Provide bolted connectors.
f. Bonding Conductors to Structural Steel: Not smaller than 6 AWG unless otherwise indicated on Drawings. Provide bolted clamp connectors.

3.3 SELECTION OF COLORS AND IDENTIFICATION MARKINGS

A. Comply with 29 CFR 1910.144 for color identification of hazards, and the following:

1. Ceiling-mounted hangers, supports, cable trays, and raceways must be finished, painted, or suitably marked safety yellow where less than 7.7 ft above finished floor.

B. Color Coding Scheme for Communications Cable and Terminations: Comply with BICSI N1 and TIA-598.

C. Accessible Fittings for Raceways: Identify cover of junction and pull box of the following systems with wiring system legend and system voltage. System legends must be as follows:

1. "COMMUNICATIONS."
2. "FIRE ALARM."
3. "SECURITY."

D. Identify conductors, cables, and terminals in enclosures and at junctions, terminals, pull points, and locations of high visibility. Identify by system and circuit designation.

E. Control-Circuit Conductor Identification: For conductors and cables in pull and junction boxes, manholes, and handholes, use self-adhesive labels with conductor or cable designation, origin, and destination.

F. Control-Circuit Conductor Termination Identification: For identification at terminations, provide heat-shrink preprinted tubes with conductor designation.

G. Auxiliary Electrical Systems Conductor Identification: Self-adhesive vinyl tape that is uniform and consistent with system used by manufacturer for factory-installed connections.

H. Equipment and Cabling Identification for Administrative Records and Labeling: Comply with TIA-606 requirements for Class 4 network administration.

I. Equipment Identification Labels:

1. Black letters on white field.
2. Indoor Equipment: Laminated acrylic or melamine plastic sign.
3. Equipment to Be Labeled:

a. Enclosures: Identify front and rear of each enclosure with self-adhesive labels containing equipment designation.
b. Communications cabinets.
c. Monitoring and control equipment.
d. Security equipment.

J. Horizontal Cables: Label each cable with a vinyl-wraparound label.

K. Cover Plates: Label individual cover plates with self-adhesive labels. Place label at top of cover plate. Identify cover plate in accordance with TIA-606.

L. Cable Ties: General purpose, for attaching tags, except as listed below:

1. Outdoors: UV-stabilized nylon.
2. In Spaces Handling Environmental Air: Plenum rated.

3.4 SELECTION OF SIGNS AND HAZARD MARKINGS

A. Comply with 29 CFR 1910.145 for danger, caution, warning, and safety instruction signs.

B. Signs, labels, and tags required for personnel safety must comply with the following standards:

1. Safety Colors: NEMA Z535.1.
2. Facility Safety Signs: NEMA Z535.2.
3. Safety Symbols: NEMA Z535.3.
4. Product Safety Signs and Labels: NEMA Z535.4.
5. Safety Tags and Barricade Tapes for Temporary Hazards: NEMA Z535.5.

C. Electrical Hazard Warnings:

1. Multiple Power Sources Warning Legend: "DANGER - ELECTRICAL SHOCK HAZARD - EQUIPMENT/RACK HAS MULTIPLE POWER SOURCES."

D. Operating Instruction Signs: Self-adhesive labels.

E. Label TBC, TBBs, and BBCs at attachment points with legend: "WARNING! COMMUNICATIONS BONDING CONDUCTOR. DO NOT REMOVE OR DISCONNECT!"

3.5 INSTALLATION OF BONDING FOR COMMUNICATIONS

A. Grounding of Communications: Bond PBB and SBBs to grounding electrode conductors at electrical power service entrance, and at electrical power derived systems serving communications equipment, using intersystem bonding termination device.

1. Structural Steel: Where structural steel of steel frame building is readily accessible within room or space, bond each SBB and PBB to vertical steel of building frame.

B. Comply with manufacturer's published instructions.

C. Reference Standards:

1. Bonding of Communications: Unless more stringent requirements are specified in Contract Documents or manufacturers' published instructions, comply with BICSI N3.
2. Consult Architect for resolution of conflicting requirements.

D. Special Techniques:

1. Bonding of Busbars:

a. Indicate locations of grounding busbars on Drawings. Install busbars horizontally, on insulated spacers 12 inch above finished floor unless otherwise indicated.
b. Where busbars are indicated on both sides of doorways, route bonding conductor up to top of door frame, across top of doorway, and down; connect to continuation of horizontal busbar.

2. Bonding Conductors:

    a. Stacking of conductors under a single bolt is not permitted when connecting to busbars.
    b. Assemble wire connector to conductor, complying with manufacturer's published instructions and as follows:

        1) Use crimping tool and die specific to connector.
        2) Pretwist conductor.
        3) Apply antioxidant compound to bolted and compression connections.

    c. Install in straightest and shortest route between origination and termination point, and no longer than required. Bend radius must not be smaller than 10 times diameter of conductor. No single bend may exceed 90 degrees.
    d. Install without splices.
    e. Support conductors at not more than 36-inch intervals.

3. Communications Enclosures: Bond metallic enclosures of telecommunications equipment with UBCs to nearest SBB or PBB.
4. Shielded Cable: Bond shield of shielded cable to SBB in communications rooms and spaces. Comply with TIA-568.1 and TIA-568.2 when grounding shielded balanced twisted-pair cables.
5. Primary Protector: Bond to PBB with insulated bonding conductor.

3.6 PROTECTION

A. After installation, protect communications equipment room fittings from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

END OF SECTION

SECTION 272200 - CONTROLLED ACCESS SYSTEM WIRING

PART 1 – GENERAL

1.1 WORK INCLUDES

A. Security Card Access System

1.2 RELATED WORK SPECIFIED ELSEWHERE (Add necessary related other spec sections here)

A. Technology General Provisions (example)

B. Cabling Systems Administration (example)

C. Technology Pathway Hardware (example)

D. Structured Cabling System (example)

1.3 SCOPE OF WORK

A. The term “Contractor” within this Specification Section shall explicitly refer to the Security Contractor (SC).

B. The Security Contractor shall install all cabling and related materials complete in strict accordance with Specifications and applicable Drawings as required for a Controlled Access (CA) system. The SC shall provide power and fire alarm connections as needed.

C. The Security Contractor shall furnish and install all conduit and backboxes. The SC shall provide all rough-in materials, with the exception of rough-in containment that is either integral to, or supplied with, the actual CA equipment.

D. The Security Contractor shall provide all final terminations required to provide a completely operational CA system. The SC shall coordinate all efforts with the Engineer prior to commencement of work.

1.4 PERMITS, CODES, AND INSPECTIONS

A. General: Contractor shall obtain and pay for all permits and inspections required by laws, ordinances, rules, and regulations having jurisdiction or work included under this Contract and shall submit approval certificates to the Architect or Engineer.

B. Codes: The installation shall comply fully with all local, county, and state laws, ordinances and regulations applicable to local area network and related communication installations.

C. The installation shall be in compliance with the requirements of the latest revisions of:

1. Building Communication International (BISCI)
2. Telecommunications Industry Association/Electronic Industries Association (TIA/EIA)
3. Occupational Safety and Health Act (OSHA)
4. Institution of Electrical Electronic Engineers (IEEE)
5. National Electric Code (NEC)
6. Underwriter's Laboratories, Inc. (UL)
7. National Electrical Manufacturer's association (NEMA)
8. National Electrical Contractors Association (NECA)
9. National Safety Code
10. Legislative Act 235 (1965) – Handicapped
11. Legislative Act 287 (1974) – Excavation
12. International Building Code (IBC) 2003
13. Americans with Disabilities Act (ADA)
14. All approved published instruction set forth by equipment manufactures.

PART 2 – PRODUCTS

2.1 EQUIPMENT SOURCE

A. The SC shall provide for all receiving, unpacking and delivery of equipment as required by the Owner's vendor. The SC shall provide all labeling of cables that support the CA system. Refer to the Drawings for additional information. Coordinate exact cabling requirements with the Manufactures (Lenel) recommendations.

B. The SC shall provide all cabling as required for the secured doors.

1. All doors shall have a composite cable that contains all required cabling as needed per door to be pulled in a single assembly to a junction box above each door - the composite cable shall have the following components / requirements:

a. Lock wiring

1) (1)#18/4 copper conductor for the lock

b. Reader wiring - depending on reader technology utilized.

1) Weigand - (1)#22/3pr copper cable with overall myler shield
2) OSDP - (1)#22/1pr low cap tinner copper rs-485 + (1)#18.2 for OSDP readers

c. REX/Spare

1) (1)#22/4

d. Door Position Switch

1) (1)#22/4 or #22/4 preferred.

e. Where in/out readers are required, a separate reader wire shall be provided if there are insufficient conductors in the composite cable assembly.
f. All cabling shall be rated for the environment for which it is installed. Cabling transitions shall be provided where required.
g. The Manufacturer shall be Windy City Wire, Belden, or West Penn Wire or equal.

C. The Contractor shall provide all other cabling from the junction box to each door element as indicated above.

PART 3 – EXECUTION

3.1 INSTALLATION

A. Cabling shall be installed in metallic conduits or run open cable where applicable, which shall be continuous from outlet to outlet without splices. Underground may be installed in PVC conduit. Direct burial cable is not acceptable.

B. Install cabling without sharp bends and leave 10' coiled and un-terminated at locations and in equipment room. Termination of cables shall be by SC.

C. The manufacturer's installation procedures shall be considered part of these Specifications, though not explicitly indicated here, and shall be adhered to during the entirety of the project.

D. The SC shall be responsible for mounting all exterior mounting brackets and devices, either pedestal mounted or mounted to the building, including all outside components, such as power supply (vendor supplied), surge suppressers and receiver drivers.

E. Special care in cable installation shall be exercised to avoid grounds due to careless termination or damage to the jacket over the shield. Take special care to ensure that random contact of shield of adjacent cables does not occur in consoles and at junction boxes. Provide a minimum of one layer Scotch #33 electrical tape or equivalent.

F. Exterior units shall be mounted for optimum coverage and shall be protected from accidental contact and vandalism. SC vendor to provide all required mounting hardware.

G. All low voltage cable shall be isolated from all line voltage equipment.

H. All installations shall be installed in a workmanlike manner.

I. Data collection panels and other related hardware shall be mounted as indicated on the Drawings. The SC vendor shall verify that all equipment is mounted within manufacturer's recommended distances to prevent unwanted voltage drops, or other abhorrent behavior.

J. All cables (coax, data, fiber, and power circuits) shall be identified with proper tagging and labels as indicated elsewhere in these Specifications.
K. SC vendor shall coordinate for installation of all non-controlled access connections to the weatherproof equipment enclosures, switchers, monitors, and other equipment specified for use in this section. These connectors include grounding, coordination, and installation of 120 VAC power.

L. Refer to the Drawings for equipment quantities, locations, and installation details.

M. The Contractor shall provide Record Drawings of complete system installation to Owner.

N. The Contractor shall determine the exact nature of the environment for the installation of all environmentally sensitive pieces of equipment, and substitute materials and devices consistent to the environment to which they are to be installed.

O. Where devices being substituted are not already defined within these Specifications, the Contractor shall submit the necessary cut sheets and product data for the Engineer to provide the necessary approvals prior to installation and rough-in. Any substitution required due to environmental, or field conditions shall be made at no additional cost to the Owner.

3.2 MOUNTING HEIGHTS AND LOCATIONS

A. The equipment height shall be as noted on the Drawings. Care must be taken to ensure that mounting heights set forth by the Americans with Disability Act (A.D.A.) for said items is met.

B. All cabinets and equipment installed in low voltage or technology rooms shall be installed at locations indicated on the Drawings. Failure to comply with the equipment location shall cause the Contractor to remove and reinstall the devices and equipment in the proper location. Should a conflict arise due to unforeseen conditions, the Contractor shall contact the Engineer immediately for a resolution.

C. All door contacts shall be hidden within the door frames. Should this installation method be unavailable, the door contact shall be surface mounted on the secure side of the door.

3.3 GUARANTEE AND WARRANTY

A. Contractor shall provide a one-year warranty on installation of all cabling, transmission devices supplied under the scope of their Contract and all connections. Any defective material due to poor installation practices shall be replaced at no expense to the Owner (including labor).

B. The Contractor's guarantee shall cover all costs associated with the troubleshooting, repair, and replacement of defective work, including costs of labor, transportation, lodging, materials, and equipment.

3.4 RECORD DRAWINGS

A. Drawings shall indicate exact equipment locations on floor plans (1/16" scale, minimum). These drawings shall be dedicated solely to the Controlled Access System.

END OF SECTION

SECTION 281000 - ACCESS CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Access control system.

B. Related Requirements:

1. Section 087100 "Door Hardware" specifies the following:

   a. Electric strike(s).
   b. Electromagnetic lock(s).
   c. Delayed-egress electromagnetic lock(s).
   d. Electromechanical lock(s).
   e. Self-contained electronic lock(s).
   f. Exit lock(s) and alarm(s).
   g. Auxiliary electrified door hardware.

2. Section 087113 "Power Door Operators" specifies the following:

   a. Door operator controls.
   b. Panic exit device(s).
   c. Electric strike(s).
   d. Auxiliary electrified door hardware.

1.2 REFERENCES

A. Abbreviations

1. ACS: Access Control System
2. ADRC: Advanced Dual Reader Controller
3. AES: Advanced Electronic Encryption
4. API: Application Programming Interface
5. AUC: Advanced Unified Client
6. DAS: Direct Attached Storage
7. DHCP: Dynamic Host Configuration Protocol
8. DPS: Door Position Sensor
9. DRI: Dual Reader Interface
10. FASC: Federal Agency Smart Credential
11. FASC-N: Federal Agency Smart Credential Number
12. FICAM: Federal Identity, Credential, Access Management
13. FIPS: Federal Information Processing Standard
14. ICM: Input Control Module
15. IP: Internet Protocol

16. ISC: Intelligent System Controller
17. IDRC: Intelligent Dual Reader Controller
18. ISDC: Intelligent Single Door Controller
19. LAN: Local Area Network
20. LDAP: Lightweight Directory Access Protocol
21. NAS: Network Attached Storage
22. NFC: Near Field Communications
23. NVR: Network Video Recorder
24. OCM: Output Control Module
25. ODBC: Open Database Connectivity
26. OPC: OLE for Process Control
27. OSDP: Open Supervised Device Protocol
28. PACS: Physical Access Control System
29. PIV: Personal Identity Verification
30. POE: Power-Over-Ethernet
31. RAM: Random Access Memory
32. REST: Representational State Transfer
33. REX: Request to Exit
34. RFID: Radio Frequency Identification
35. RIM: Reader Interface Module
36. SAN: Storage Area Network
37. SIA: Security Industry Association
38. SMS: Security Management System
39. SQL: Structured Query Language
40. SRI: Single Reader Interface
41. SSL: Secure Sockets Layer
42. TCP: Transport Control Protocol
43. TDE: Transparent Data Encryption
44. TWIC: Transportation Worker Identity Card
45. UPS: Uninterruptible Power Supply
46. VMS: Video Management System

B. Definitions

1. Alarm aggregation: A mechanism of combining several alarms into a single item (group) based on certain criteria.
2. Credential: Data assigned to an entity and used to identify that entity.
3. Designated One Person Control: Requires that a designated cardholder is present before anyone else is allowed to access a certain area.
4. Designated Two Person Control: Requires the presence of two cardholders, designated as special “Team Members”, to restrict individuals from being alone in restricted or highly secure areas as well as restricting the type of personnel allowed in those areas.
5. Devices Global Hard Anti-passback: Once access has been granted via a valid badge presentation, (1) a cardholder cannot present their badge to another entry card reader within the same area without first presenting it to the area's exit card reader, and (2) any attempt to use any card reader in the same area other than exit card reader shall result in access denied and an alarm report.
6. First Card Unlock: Function where a pre-determined time zone activated unlock command is suppressed until a valid credential has been presented and granted access to the portal.

7. Global Soft Anti-passback: As defined in Devices Global Hard Anti-passback with the exception that the cardholder shall be allowed access to a new area for which he is authorized.
8. (Guard) Tour: One or more checkpoints (card readers or alarm inputs) checked during a guard's predetermined path.
9. Interlock group readers: Configuration for local, but not global, anti-passback whereby only one door may be opened at a time within the area and an alarm is generated for any denied access.
10. Pass-Through: The ability assigned to a person's credential that allows them to access a door even if in lockdown state.
11. Occupancy Limit: Restricts the number of cardholders that shall be present in an area at any given time.
12. Region: A separate instance of the distributed database.
13. Representational State Transfer (REST): A software architecture style consisting of guidelines and best practices for creating scalable web services.
14. RESTful API's (Application Programming Interfaces): Term given to Web services using the REST architecture.
15. Runaway detection: A situation when there are more than a specified number of alarms coming from a given device within a specified time interval.
16. Tailgate Control: Triggered when a person receives an access granted, an output will be fired momentarily for a single person or twice for two people, for a maximum duration of one second.
17. Timed Anti-passback: Configurable wait time between an initial badge swipe and the time at which the same badge will be accepted again at the same card reader.
18. Timezones: Time-based periods, encompassing time of day, day of the week and holidays, which are stored on the ISC and control hardware behavior, cardholder access, online mode of the readers, activation of outputs, masking of inputs, and logging events to the database.
19. Two Person Control: Restricts access to certain areas unless two (2) cardholders are present, where the second badge must be presented within a designated time interval of the first to provide access.

C. Reference Standards

1. Underwriters Laboratories

    a. UL 294 - Standard for Access Control System Units
    b. UL 2610 - Standard for Commercial Premises Security Alarm Units and Systems

2. ISO/IEC 14443-3:2011 – Identification Cards
3. ADA – Americans with Disabilities Act
4. National Fire Protection Association

    a. NFPA 70 National Electric Code
    b. NFPA 101 – Life Safety Code
    c. NFPA 731 - Standard for the Installation of Electronic Premises Security Systems

5. Institute of Electrical and Electronic Engineers

    a. IEEE 802.3 Ethernet Standards

6. National Institute of Standards and Technology (NIST)

    a. Federal Information Processing Standard Publication 140-2 – Security Requirements for Cryptographic Modules
    b. Federal Information Processing Standard Publication 197 – Advanced Encryption Standard
    c. Federal Information Processing Standard Publication 201 – Personal Identity Verification
    d. SP 800-116 A Recommendation for the Use of PIV Credentials

7. Security Industry Association

    a. Open Supervised Device Protocol (OSDP)

8. Video

    a. ISO / IEC 10918 – JPEG
    b. ISO / IEC 14496 –10, MPEG-4 Part 10 (ITU H.264)

D. Submittals

1. Informational Submittals

    a. Product Data
    b. Manufacturer product data sheets
    c. Manufacturer product instructions, and installation and operating manuals
    d. Shop Drawings

        1) Complete set of proposed drawings, identifying equipment locations, types of cabling, numbers of conductors, raceway locations, and termination points of each conductor.
        2) Complete listing of proposed devices, indicating interconnection equipment locations and specifying terminal/connecter termination locations.
        3) Operational narrative of each component/system.

2. Record Documentation:

    a. As-builts
    b. Shop drawings
    c. Panel diagrams

3. Maintenance Material Submissions:

    a. Listing of spare parts required to maintain the system.

4. Closeout Submittals

    a. Final listing of doors, locations, and normal status in MS Excel format.

b. Complete set of supplier's operating instructions, installation instructions, and troubleshooting guide, to include but not be limited to instructions for:
c. Schematic drawings depicting type and location of interface equipment/components, 1. number of cables and conductors, raceway locations, types of connectors, circuit requirements and type and dimensions of enclosures.
d. Warranty Documentation:

1) Manufacturer warranty statements for all system components and applicable equipment.

1.3 QUALITY ASSURANCE

A. Contractor qualifications:

1. Company with a minimum of 10 (ten) years system design, engineering supervision, and installation experience in the access control industry.
2. Contractor must be a current, authorized reseller for the SMS product and manufacturer, and provide evidence thereof. Must be within 25 miles of project site and have capability of servicing equipment and software.

B. Manufacturer Qualifications

1. The SMS Hardware and software manufacturer(s) shall have delivered security management products for at least 10 (ten) years and shall have a sufficiently large and diverse installed base to ensure competence in delivering, deploying, and supporting systems of this type and scale throughout their expected service life.

1.4 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Acceptance: Upon delivery to the site, Contractor shall inspect all products and materials for any damage.

1.5 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results.

1.6 MANUFACTURER CAPABILITIES

A. Advanced Services - The SMS Manufacturer shall have an in-house Advanced Services group available to contract for:

1. Professional engineering services to include on-site or remote advanced support, enterprise planning and advanced deployments, system design, supporting software tools, database migrations and conversions, emergency service, system assessments.
2. Remote Management and Embedded Services to include project management and coordination, contract management, VAR coordination, and Manufacturer resource coordination.

3. Custom applications and reports.

B. 3rd Party Product Certification Program

1. The SMS Manufacturer shall have a Partner Program that allows other products to develop interfaces to the Security Platform based on a RESTful Web Services API.

   a. Third-party integrations shall have been certified by SMS Manufacturer personnel.
   b. Each new revision or version of the third-party system shall be subject to recertification.

2. Interfaces developed shall be tested and certified by the SMS Manufacturer for each new version of product released. The Certification Program shall have integrations which include, as a minimum, Command and Control, Key Management, Fire Detection, Intrusion, Elevator and Critical Communication products, and the capability to integrate with other security and non-security products, as desired by the customer.

C. Global Support Capability

1. The SMS Manufacturer shall have dedicated global support mechanisms in place to provide local support to any installation covered by this specification, regardless of location throughout the world.
2. The SMS Manufacturer shall have multiple independent Value-Added Reseller (VAR) options to support customers in each market.
3. The SMS Manufacturer shall have a proven and demonstrable history of deploying Enterprise-scale solutions to Global customers.

1.7 WARRANTY AND SUPPORT

A. Manufacturer shall warrant that the physical media on which the Software is distributed, if applicable, is free from defects in materials and workmanship and that the Software will function in substantial accordance with the Documentation that accompanies the Software for a period of one (1) year from the date of shipment of the Software to the reseller. This limited warranty is void if failure of the Software results from accident, abuse, modification, misapplication, misuse, abnormal use, or a virus.

B. Hardware warranties shall be provided by the original manufacturer of the specific hardware device or component.

C. Manufacturer shall offer a supplemental software support program to include software updates and upgrades.

D. An optional 3-year warranty and preventive maintenance proposal shall be offered with base bid.

1.8 LICENSE

A. The SMS shall only require a single license key to be present on the database server for the SMS to operate.

1. A license key on the database server shall determine the number of client workstations that shall be able to connect to the SMS and access its functionality.

    a. The license key shall either be a physical device or a software license key.
    b. License keys shall not be required at the client workstations.

2. The SMS shall allow the SMS user the ability to activate, return, or repair the software license key.
3. The software license shall only be used on a physical computer or in a VMware virtual environment.

PART 2 - PRODUCTS

2.1 MANUFACTURER

A. Manufactures: Subject to compliance with requirements, Campus System shall be a Lenel Compliant System, all new controllers and associated software must be Lenel Onguard 8.2 based to maintain capability of new System.

1. Local approved LenelS2 vendor option:
   Fedora Intertech
   1501 Preble Ave
   Pittsburgh, PA 15233
   Phone: 412-246-1200

2.2 GENERAL DESCRIPTION

A. The Security Management System (“SMS”) shall be the key central component for managing physical security access control, video, alarm monitoring, visitor management and selected other functions provided through third party integrations as specified herein.

B. Scalability

1. The SMS shall be capable of processing an unlimited number of credential readers, scalable from single site to multiple sites.

C. Database

1. The SMS shall be based upon one or more independent secure SQL database instances, one of which has been designated as the system master.

D. The SMS shall provide a variety of integrated core functions to include:

1. regulation of access and egress
2. provision of identification credentials
3. video management
4. monitoring and managing alarms related to both access control and intrusion

5. visitor management

E. Integrations – The SMS shall employ a RESTful, Web Services API to enable the integration of select third party products and functions with the core functions of the SMS.

F. User Interface

1. The SMS shall provide access to licensed and installed applications through a common browser-based launcher application that can invoke various components and modules of the SMS from a single location, with users able to customize, rearrange, and retain configurations.

a. This launcher shall offer Single Sign On and enable launch of both Windows and browser clients.

G. Communication Security

1. All communication paths within the SMS shall support encryption to provide end-end communication security.

H. User Login and Authentication

1. The SMS shall offer both a native capability to manage system users, as well as the option to authenticate system users through an external Active Directory, LDAP, or OpenID Connect® (OIDC) system. Solutions that do not support OpenID Connection authentication of system users shall not be acceptable. System shall also allow for denial of login after a specified number of failed retries.
2. System shall also log the user out of any browser clients after a specified period of inactivity.
3. Customizable login message and ability to link to external websites or documents.

I. The SMS should provide the ability for control of expiration and complexity for the User Account Passwords internal to the system such that system could comply with existing NIST and NERC guidance.

1. Complexity options to include: Upper/Lower Case, Numeric, Special Characters, Minimum Length, Prohibited List, and Password history
2. Expiration options to include: Number of days as well as administrator enforced update of password.

J. Operational Efficiencies

1. The SMS shall offer a self-service portal for employees to request access and for area owners to approve, hold or deny requested access. This web portal shall also offer administrator-configurable self-service functions for cardholders such as PIN change, setting up a visitor and visit record, and resending a mobile credential to their mobile device.
2. Transactions shall be reportable within the SMS.
3. The SMS shall offer an expedient means to identify access rights provided in violation of corporate policies and to automatically revoke access rights for these violations.

4. The SMS shall offer a browser-based analysis tool that collects system data for comprehensive system health monitoring and displays it on a customizable, intuitive dashboard.

2.3 ARCHITECTURE

A. Open Architecture - The SMS shall support an 'open architecture' allowing for additional support of products outside of the vendor proprietary options.

1. SMS shall support hardware that is non-proprietary such that other vendors could readily offer support for these devices. Access Control Panels that are only supported by a single SMS provider shall not be acceptable.
2. SMS shall support a RESTful Web Services Application Programming Interface (API) that supports the opportunity for 3rd party integration. Access to this API should be managed through a program to ensure that certified integrations utilize this API appropriately.
3. The SMS shall, when possible, leverage open or industry standards for device and system design.

B. System Topology

1. The SMS shall include a central or distributed server component for managing security and any associated integrations.

    a. The SMS server shall function as an application server for connectivity of workstation based or browser-based clients for support of configuration and management.

2. An input or output linkage feature shall allow linking of input points to output control points.
3. Tasks shall be accessible from compatible client workstations on the network utilizing any of the following:

    a. Traditional client-server architecture, using either Windows clients or browser clients for common day-to-day tasks.
    b. Support for federated system architecture (multi-server, multi-database) where the SMS supports the expansion of the system architecture and allows for user deployment based upon their system architectural needs.
    c. Centralized distribution (publishing) of applications using Windows Terminal Server and Citrix® on Windows, UNIX, Linux or Apple Macintosh based systems through any compatible internet browsers and/or by means of a mobile computing platform or mobile device.

4. Redundancy - The SMS shall support the following means of fault tolerance and SMS redundancy:

    a. Hot Standby Servers - A Primary Server shall be the main server that is in use when the SMS is operating under normal conditions, and the SMS shall mirror its database information to a Backup/Secondary Server.

1) Field hardware shall be configured for both the Primary Server and the Backup Server, which shall each recognize the same TCP/IP ISC address on the network.
2) Upon sensing Primary Server failure, the Backup Server shall automatically initiate itself as the Primary Server and shall begin communication with the Field Hardware.

a) Frequency of check for Primary Server failure: 5 seconds
b) Resynchronization time upon Primary Service restoration: 5 minutes maximum

b. Cluster/Warm Standby - A Primary Server shall be the main server that is in use when the SMS is operating under normal conditions.

1) Field hardware shall be configured for both the Primary Server and the Backup Server, which shall each recognize the same TCP/IP ISC address on the network.
2) Upon sensing Primary Server failure, the Backup Server shall bring the necessary services online and shall begin communication with the Field hardware.
3) Shared media devices, either single or dual, shall be employed to house the hard disk used by both servers.

a) Resynchronization time upon Primary Service restoration: 5 minutes maximum

c. Disk Mirroring - This configuration shall allow data to be stored on dual hard disks running simultaneously.
d. RAID Level 10 - The SMS shall offer a Fault Tolerant Redundant Array of Independent Disks Level 10 (RAID Level 10) with a hot standby disk.

1) Redundant components: disk storage, controller channels, high efficiency power supplies

e. Distributed Intelligence - In the event SMS communications is lost or the database server fails, Intelligent System Controllers shall provide complete control, operation and supervision of the system's monitoring and control points.

1) Should the downtime exceed the capacity of the Field Hardware buffer and events are overwritten, an alarm shall appear in the Alarm Monitoring Window notifying the System Operator that events were overwritten.

C. Inter-site Communications

1. The SMS shall support a distributed system (application and database) installation to support geographical or logical separation and management of installations while maintaining a centralized system for reporting.

a. Each distributed system shall support operation of the local clients and hardware, and provide configuration, event, and transactional events to the central system.
b. The SMS shall use a message architecture to transfer necessary incremental credential data from one site to another. This architecture shall provide data queuing, guaranteed delivery, and secure transmission of this data.

D. External Interaction of Data

1. The SMS shall be able to connect to and interface bi-directionally with external data sources utilizing the following methods:

a. ASCII with support for XML formatted text exchange
b. Real-time exchange of data via Active Directory or LDAP
c. Software Application Programming Interface (API)

E. Database - The SMS shall utilize a single supported relational database.

1. Acceptable databases: Microsoft SQL, Microsoft Azure SQL, Oracle
2. Acceptable operating systems: Microsoft Windows Servers or Clients
3. Protection of 'Data at Rest' within the database shall be provided via SQL Transparent data encryption (TDE) and shall be supported to perform real-time I/O encryption and decryption of the database and database log files.
4. The SMS database server shall support an unlimited number of cardholders and visitors limited by the available memory, storage, and processing of the devices. The SMS database server shall support an unlimited number of system events and System Operator transactions in the history file limited only by available hard disk space. The SMS database server shall support an unlimited number of system events and System Operator transactions in the history file limited only by available hard disk space.
5. The SMS shall support bi-directional data interface to external databases in real-time or in a batch mode basis.

a. The SMS shall support a one-step download and distribution process of cardholder and security information from the external database to the SMS database and through the system to Intelligent System Controller (ISC) databases.
b. If a required communication path is broken, the data shall be stored in a temporary queue and shall be automatically downloaded once the communication path is restored.

F. Security

1. Each page in the cardholder record shall be permission protected.
2. Each field in the database shall be permission protected.
3. Communication throughout the SMS shall be AES encrypted, using TLS where practical.
4. All cardholder PIN codes within the system shall be encrypted.

G. A Network Account Management Module shall integrate SMS cardholders with external user network accounts, allowing System Administrators to perform a set of administrative tasks in Windows domains from the System Administration Module, and to create a link between physical access control and logical domains.

H. The SMS shall allow, through standard API toolkits, System Administrators to expose specific SMS data and events that are relevant to IT information or other third-party systems or to allow, System Administrators to accept and process information exposed from the IT information or other third-party systems.

2.4 CORE FUNCTIONALITY

A. Access Control - access granted or denied decisions, define access levels, and set time zones and holidays. The SMS shall support features such as area control (two-man control, hard, soft, and timed anti-passback), database segmentation, and time zone or holiday overrides.

1. Configuration

a. Credentials

1) SMS credential management functionality shall allow:

a) enrollment of cardholders via traditional thick client and/or by a browser-based credential application for the storage of cardholder records in the database
b) formatting of cardholder records
c) capturing of images, biometric data, and signatures
d) user-defined fields in the cardholder record
e) issuance / reissuance of traditional plastic badges and/or mobile credentials using information in the cardholder record. It shall be possible to print to a designated, configured badge printer from both browser-based and Windows clients. This mechanism shall be based on a print server architecture supported by the SMS. Solutions requiring a printer directly connected to the device on which the browser client is used shall not be acceptable.
f) import or export of cardholder data from internal or third-party systems.

i. data delimiter: definable
ii. import-export filters: selectable

g) assignment and modification of access rights and levels
h) definition of cardholder escort requirements
i) cardholder use limits
j) user definition of extended individual strike and door held open times
k) deactivation of credential following a period of non-use
l) furnishing and management of digital certificates for smart cards
m) searching for records and images based on any fields in the database

2) Field types: text, date, numeric, drop-down lists

b. Access Levels shall consist of a combination of readers and timezones.

1) Minimum number of supported access levels per controller: 32,000

2) Minimum number of supported access levels per badge: 255
3) Card readers shall be assignable to any or all access levels.
4) Each access levels shall have the option for “First Card Unlock”.
5) Temporary access levels - Within the constraint of number of access levels, the SMS shall have provision for access levels with definable start and end dates.
6) Precision access levels - Beyond the constraint of number of access levels, the SMS shall be able to assign access levels with unlimited card reader and timezone combinations.
7) Access Groups - The SMS shall provide for access groups, assignable to an alphanumeric name, containing up to 32 access levels.
8) Timezones - Pre-defined card reader settings shall have the flexibility to be overridden or modified for locking state and required authentication means.

c. Holidays shall be assignable via an embedded calendar with an alphanumeric name and to individual timezones.

1) Minimum number of holiday assignments: 255
2) Number of holiday group types: 8
3) Repeat frequency: annual
4) Daylight Savings Time: definable for automatic time conversion
5) Span: configurable for multiple days

d. Timezones

1) The SMS shall be capable of creating timezones, each with intervals assignable to any day of the week.

a) number of timezones: 255 minimum
b) Intervals: 6 minimum

2) Timezones shall be allowed to belong to any or all access levels so that the time zone only has to be defined once.

e. Scheduling - The SMS shall have a scheduling utility to allow System Administrators to schedule actions to occur on a one-time or a recurring basis and to maintain a log of actions executed.
f. Field Hardware

1) The SMS shall allow for a Windows-based configuration of the following types of field devices which participate in the access control function:

a) Intelligent System Controllers (ISC’s)
b) Input Control Modules (ICM’s)
c) Output Control Modules (OCM’s)
d) Access card readers
e) Integrated lock-readers

2) The SMS shall provide a device discovery utility to aid in configuration.

a) Scope: local subnet or multiple subnets
b) Display categories: brand, discovery service, device status, device type
c) Available functions: ping, reboot, default password check, version discovery, launch device web server, save credentials, update IP address.

3) When a field hardware device is configured, the device shall appear in a graphical system overview tree and be available in drop down lists which support operator access.
4) The SMS shall have the ability for bulk add, modify, and delete privileges for ISCs and card readers to allow for the ease of addition and maintenance of themes.
5) The System Administrator shall have the ability to group field devices into monitor zones.
6) System status update frequency shall be configurable.

g. Alarm Masking Groups - System Administrators shall be able to create groups of alarm inputs that enable them to mask or unmask multiple Input Control Module inputs and card reader inputs simultaneously.

1) Alarm Masking Groups shall be able to be masked or modified as a group or as individual points.
2) Alarm masking shall support two-man control.
3) Number of Alarm Masking Groups: maximum 64 per ISC
4) Alarm inputs: maximum 128 per Alarm Masking Group

h. Event Linkage - The SMS shall support a global linkage feature whereby any input or output or event shall be linked to any other input or output or event., with the following additional characteristics:

1) support global I/O function lists, consisting of sequences of up to six actions
2) association with panel areas

i. Graphical Maps - The SMS shall support graphical maps that display device or group status, function lists and video cameras dynamically in real-time, and support the following:

1) graphical maps are available via traditional thick client and/or through a browser-based monitoring application.
2) configuration to appear on command or when specified alarms are acknowledged.
3) graphical map creation software that allows the import of map backgrounds from supported file formats
4) user-defined text and icons
5) configuration of map icon shape and color to represent the state of the associated device.
6) pan and zoom capability is supported for Maps when viewing through the browser-based client.

2. Badging - SMS badging functionality shall allow for the creation of different badge types based on a database field, the linking of that field to a badge type to automate the process of credential production, and the use of security colors, chromakey, and ghosting, to allow quick identification of personnel access authority.

    a. The SMS shall have the ability to create and maintain badge designs, with tools and support for image import and export, ghosting, signature capture, bar code, and smart card chips.

        1) Image formats: all standard industry image formats
        2) Support image processing and effects with a pre-defined effects gallery.
        3) A badge layout and creation module shall support custom badge designs by the User.

    b. Additional badging related functionality shall include the following:

        1) assignment of access levels and access groups, including bulk assignment, modification or deletion of access levels
        2) custom badge layout
        3) mobile and remote badging
        4) printing: print limits, batch printing
        5) magnetic stripe encoding using any of three tracks
        6) support for all industry standard bar code formats

    c. Credential images shall be digitized using industry standard JPEG image compression and printed using a high quality and direct card printing process.
    d. The System Operator shall have the following functions available when enrolling cardholders: choose a badge type, select access levels, enter personal identification numbers (PIN), and/or any other user-defined fields.
    e. A badge form shall keep a complete history of every badge that was assigned to the cardholder’s record to include cardholder badge ID, issue code, badge type, badge status, activation and deactivation dates and times, PIN numbers, embossed numbers, and anti-passback information.

3. Ingress and Egress

    a. Individual Use

        1) Access Cards

            a) Physical characteristics

                i. 30 mil thickness, ISO compliant

            b) Card types supported:

                i. Proximity – 125 kHz
                - HID Prox
                - AWID

- Legacy GE Security ProxLite

ii. Magnetic stripe – ABA Track 1, 2, and 3.

iii. Smart Cards - contact and contactless, 13.56 MHz
- MIFARE - 1 kB (8 kb) and 4 kB (32 kb)
- MIFARE DESFire
- It must be possible to make the keys for DESFire credentials unique for each card based on the NXP AN10922 diversification algorithm and shall allow customer-specified diversification inputs to be used.
- HID iCLASS
- U.S. Government FIPS 201 and HSPD-12 compliant, including TWIC

iv. PIV standard formats

v. Mobile Bluetooth Credentials to be installed and used from a smart phone
- LenelS2 BlueDiamond Credentials
- Origo HID

vi. Mobile NFC Credentials to be installed and used from a smart phone

c) Data formats supported:

i. Magnetic stripe - with card number, facility code, and issue code combinations up to nine-digit card number and two-digit issue code
ii. Wiegand - all industry standard variations
iii. HID Corporate 1000 - 32 bit and 48 bit
iv. 200 bit BCD FASC-N output of FASC-N readers
v. 75-bit Wiegand Binary output of GSA approved FASC-N readers
vi. Custom

d) The SMS shall support desktop smart encoding and inline smart encoding for relevant affected reader technologies.

e) The SMS shall support a card reader cipher mode, emulating the presentation of a card credential by manually entering their badge ID.

f) The SMS shall support a configurable denied access attempts counter for each card reader.

g) Extended Held-Open Time - Authorized cardholders shall have the ability on demand to extend the time for which a door is help open after access is granted for up to 30 minutes.

h) An alarm shall be generated upon an attempt to use any badge that is not marked active in the SMS.

2) The SMS shall support the provisioning and usage of Mobile Credentials.

a) Mobile Credentialing shall be configurable from the SMS to include:

i. Name for the credential service
ii. URL for issuing credentials
iii. Requirements for certificate-based authentication and/or username password to access web portal

b) Supported mobile credentials:

i. LenelS2 - BlueDiamond
ii. HID Mobile Access on Origo

3) Biometrics shall provide multi-factor (or alternate) identification through the measurement and comparison of human characteristics including fingerprints, hand geometry, iris imaging, and facial features. The SMS shall have the capability to verify the identity of enrolled individuals using products from approved manufacturer partners.

a) Capture of biometric data (template) shall be accomplished via the biometric device or associated reader.
b) Cardholder biometric data (template) storage means: smart card; in access controller; in the biometric partner database.

4) Request to Exit (REX) - The SMS shall be able to provide an event when a REX is initiated.
5) The SMS provides the ability to alert the System Operator when a cardholder does not present their credential at a required location in a designated period of time.
6) Pre-Alarm - The SMS shall support a card reader pre-alarm feature which sounds a tone prior to a door held open alarm for a configurable period.

a) The SMS shall allow operator response instructions to be specified for each type of alarm and delivered via text and/or audio.

7) For doors with keypad reader, allow door forced open alarms, door held open alarms to be configured for local keypad acknowledgement prior to allowing System Operator to acknowledge and complete alarm processing

b. Area Control - The SMS shall implement area control implementing functionality affecting more than one person, and have the following elements:

1) Global and Local Hard Anti-passback
2) Global and local Soft Anti-passback
3) Timed Anti-passback
4) Two Person Control
5) Designated One Person Control
6) Designated Two Person Control
7) Tailgate Control

8) Occupancy Limit
9) Interlock group readers

c. Keypad Alarm Response

1) The SMS Shall support an acknowledgment process that requires a response to access violations at both the Alarm Monitoring Client level and at the local reader location where alarms can be cleared only after the following the required procedure.

d. Badge Override

1) The SMS shall provide an override to allow badge access through a reader, even when set to Locked mode, for designated users (such as for a first responder badge).

e. Mustering - The SMS shall provide a mustering function to automatically register cardholders that are on site during an incident.

1) Muster Mode shall mean that an incident has occurred, and an evacuation is required of one or more a Hazardous Locations.

a) Triggers

i. automatic: occurrence of a designated hardware event
ii. manual: by System Operator

b) Reset: manual by System Operator or Automatic based on Global I/O

2) Hazardous Location (s) shall be defined using entry and exit readers associated with the location.

a) One or more safe locations shall be designated for each a Hazardous Location.
b) Entry and exit card readers shall be provisioned at each portal with the requirement that a badge always be used to enter or exit Hazardous and Safe Locations.

3) Muster Alarm and Reporting

a) When a Hazardous Location is in Muster Mode, all associated Alarm Monitoring Workstations shall be notified with a breakthrough notification and Muster Reporting shall be active.
b) Live Muster Report

i. display the last location of each cardholder based on card swipe.
ii. activation:

- immediately upon entering into Muster Mode

- after a specified time period from Muster Mode activation
- after the number of personnel in the Hazardous Location reaches a given count.

iii. configurable for automatic refresh time and automatic end

c) Muster Status Reporting: individual cardholders in Hazardous Location
d) Live Hazardous Location and Safe Location Reports: cardholder listing and record selection
e) Operator Display

i. Hazardous Locations and Safe Locations shall be placed on graphical maps' System Hardware Status Tree as Area Icons with associated head counts.

4. Guard Tour

a. A tour shall consist of a series of checkpoints that shall include card readers and/or alarm inputs.
b. Each tour shall be assigned to one or more alarm monitoring Workstations indicating from where automatic tours are to be launched.
c. Tour checkpoints shall be assigned minimum and maximum times within which to be reached.
d. The SMS shall handle both scheduled and random tours.
e. Scheduled tours shall have an Alarm Monitoring Window pre-departure notification.
f. Tours will have the option of being linked to live video.
g. Guard tours shall capable of being monitored through a tracking window including tour details and status.
h. The SMS shall support aggregation of tours into tour groups.

5. Elevator Destination Dispatch

a. SMS shall support network/data level integration to elevator destination dispatch systems
b. Access control information shall be shared with the elevator destination dispatch system as needed to facilitate the access control decision.

6. Direct Wired Elevator Control - The SMS shall provide elevator control using standard access control field hardware that will permit the restriction of cardholder access to certain floors while also allowing general access to other floors, with the following additional functions:

a. Allow, at the elevator, the use of any card reader and card reader modes used on any other card reader in the SMS.
b. Track which floor was selected by an individual cardholder for auditing and reporting purposes.

c. Provide an option where the floors of a building are able to be configured into logically divided sections (floor groups) to prevent passenger requests between designated sections.

7. Field Devices

a. Interface

1) The SMS shall be equipped with the access control field hardware required to receive alarms and administer access granted or denied decisions.

Devices without Lenel Part Numbers

a) Intelligent System Controllers (ISC)
b) Intelligent Single Door Controller (ISDC)
c) Intelligent Dual Reader Controller (IDRC)
d) Advanced Dual Reader Controller (ADRC)
e) Input Control Module (ICM)
f) Output Control Module (OCM)
g) Single Reader Interface Module (SRI)
h) Dual Reader Interface Module (DRI)
i) Reader Interface Module (RIM)
j) Access Control Network Door Controllers or Network Controller/Readers
k) Power over Ethernet Plus (PoE+) Enabled Dual Door Interface
l) Network Adapters
m) Communication Star Multiplexer
n) RS-485 Interface Module
o) Network ready power supplies and enclosures

i. On-demand and scheduled testing of system standby battery sets
ii. Reports and alert notifications to the SMS and the database
iii. UL Listed prewired system enclosures with LenelS2 connectors
iv. Compatibility with enclosure wire duct systems for wire protection and integrity
v. Modularity of system power components for expansion and configuration
vi. A minimum MTBF of 80,000 hours for reliability

p) Dual Reader Interface (DRI)
q) Intelligent, wireless, and combination locks

Devices with Lenel Part Numbers

a) Intelligent System Controllers (ISC)

i. LNL-X3300

b) Intelligent Single Door Controller (ISDC)
i. LNL-X2210

c) Intelligent Dual Reader Controller (IDRC)
   i. LNL-X2220

d) Advanced Dual Reader Controller (ADRC)
   i. LNL-X4420

e) Input Control Module (ICM)
   i. LNL-1100-S3

f) Output Control Module (OCM)
   i. LNL-1200-S3

g) Single Reader Interface Module (SRI)
   i. LNL-1300-S3

h) Dual Reader Interface Module (DRI)
   i. LNL-1320-S3

i) Power over Ethernet Plus (PoE+) Enabled Dual Door Interface
   i. LNL-1324e

j) Communication Star Multiplexer
   i. LNL-8000

k) Network ready power supplies and enclosures shall provide: (reference Appendix E)
   i. On-demand and scheduled testing of system standby battery sets
   ii. Provide reporting of battery life “out of tolerance”
   iii. Reports and alert notifications to the SMS and the database
   iv. UL Listed prewired system enclosures with Lenel connectors
   v. Compatibility with enclosure wire duct systems for wire protection and integrity
   vi. UL Listed modularity of system power components for expansion and configuration
   vii. A minimum published MTBF of 80,000 hours for established reliability

l) Intelligent, wireless, and combination locks

2) The SMS must be able to retrieve device serial numbers from field hardware, excluding card readers, biometric readers, and keypads.

b. Data download

1) The SMS shall provide for the downloading of data to the ISCs. Downloads shall load SMS information (timezones, access levels, alarm configurations, etc.) into the ISC’s first, followed by cardholder information and card reader configurations.

2) Information on cardholder status, badge status, timezones or access levels shall download in real time as they are added, modified, or deleted from the SMS.

c. Permission control - The SMS shall allow System Administrators to set permission control for individual devices within a monitoring zone for command override.
d. Device grouping - The SMS shall support device grouping for uniform command and control of groups of devices within the system.
e. Card readers

1) Options to include:

a) User commands
b) Door strike, REX and DPS functionality
c) Duress actions
d) Alarm masking
e) Logging requirements
f) Selection as “In” or “Out” reader
g) Use limits

2) The SMS shall provide connectivity to, proximity/mobile ready, Smart Card and smart card/mobile ready readers which provide continuous supervision and monitoring of reader processor and wiring integrity by means of a non-proprietary communications protocol standard.

3) The SMS shall support encrypted reader to panel communications using the SIA OSDP Secure Channel protocol.

a) OSDP File Transfer capabilities shall be supported
b) Flexible support for OSDP manufacturer specific commands shall be provided. It shall be possible to send commands based on a schedule or manually.

f. Input Control Modules (ICM’s) options to include:

1) Alarm masking
2) Local linkage of inputs and outputs
3) Output activation rules
4) Input configuration for Guard Tour
5) Entry (latched, not latched) and Exit delay modes

g. Intelligent System Controller (ISC) capabilities shall include:

1) Administrator functions to group, add, modify or delete ISC’s in the system
2) Ability to update firmware or replace hardware while maintaining complete hardware and data configuration settings
3) A distributed intelligence redundancy mode, whereby the ISC, configured with a UPS battery to maintain the unit for 24 hours, participates with other ISC's to provide complete control, operation and supervision of the system’s monitoring and control points in the event of SMS server failure.

a) cardholder capacity: configurable up to 1,000,000
b) event capacity: configurable up to 50,000

h. A system Operator shall have the option to manually control the output points or input points connected to the SMS.
i. The SMS shall support a real-time graphical system status tree or list window that graphically depicts configured field hardware devices.

8. Distributed Access Level Management

a. The SMS shall provide a browser-based interface for the assignment of access rights to individuals or groups of cardholders, using a simple user-interface paradigm suitable to general employee use, and not requiring specialized training on the SMS
b. The SMS administrator shall have the ability to designate for which areas a manager has assignment rights. These rights shall then be reflected in the browser interface accessible by the area manager, such that only areas for which they have authority are available for assignment.
c. The browser-based tool for access rights assignment by area managers shall have the ability to search for cardholders and to view cardholder details, constrained by the permissions of the manager

B. Alarm Monitoring - The SMS will provide the ability to monitor system and device Alarms/Events, Field Hardware Command and Control and Status Monitoring and system support functions, for the use of the operators of the system.

1. The SMS shall provide monitoring options through workstations installed or browser-based clients.
2. An Alarm Monitoring window shall provide System Operators information about the time, location, and priority of an alarm and provide the ability to sort pending and new alarms based on event detail.

a. Detail shall include at a minimum: Date/Time, Description, Priority, Controller, Device, and person.

3. Alternate alarm view windows shall be available to support: Alarm or Badge Activity Monitoring, Event Tracing (Live/Historical), and Alarms Pending Response

a. Operators shall be able to acknowledge alarms from any alarm view window.

4. Monitor support shall include the ability to view live and recorded surveillance video and link video to alarm events.
5. Monitor support shall include options for comparison of the in-person cardholder to their stored image either in person or via live video. Cardholder Verification and Video Verification.
6. The SMS shall allow a System Operator to:

a. monitor alarms in their assigned monitor zone and to perform field device control actions on specified devices in that zone from either thick client, web client or mobile client platform
b. delete the alarm from the alarm monitoring window without acknowledging the alarm
c. enter and edit an Acknowledgement note detailing the cause of specified alarms and the actions taken, along with a prescribed selection of user-defined response fields
d. activate, deactivate, or pulse outputs configured and associated with a card reader
e. mask or unmask each individual card reader door forced open alarms, door held open alarms, and associated auxiliary alarm inputs
f. display a cardholder record with the stored cardholder's image
g. verify that a person using a credential matches their stored photo
h. open multiple cardholder verification windows to cover multiple readers at the same time
i. initiate several traces of cardholders, assets, and/or field hardware devices while monitoring alarms
j. initiate an historical trace for a device, specifying a date and time range
k. filter alarms from the trace window to include access granted, access denied, system, duress, and area control alarms and by alarm source
l. perform a trace on any ISC, ICM, Alarm Input, Credential, Intrusion Detection Device, Monitor Zone, or card reader
m. manually override card readers, alarm points, and relay outputs
n. combine, enable, or disable alarms for aggregation
o. acknowledge or delete a group of aggregated alarms
p. view runaway devices

7. System Administrators capabilities shall include:

a. set permission control for individual devices within a monitoring zone for command override
b. assign default monitor zones to monitoring workstations
c. option to define monitor zones to include sub devices of an ISC
d. configure how the SMS handles the annunciation of alarms on an individual alarm or event basis
e. set display parameters for unacknowledged alarms

8. Notifications - Upon alarm, the SMS shall allow for:

a. automated sending of texts or e-mail messages
b. forwarding alarms to another location

9. Annunciation - The System Administrator shall have the ability to configure how the SMS handles the annunciation of alarms on an individual basis.

a. These attributes and actions shall be assignable on a 'global' basis to all devices that share an alarm description.

10. System Administrators shall be able to route and re-route device alarms and events to defined monitoring client workstations on the network, regardless of where the alarm is generated in the field.
11. A real-time graphical system status tree on the screen shall indicate the status of devices to reflect secured, unsecured, in alarm, or offline and provide command and control functions for authorized users.
12. Output control operations shall be available to lock, unlock or pulse control points.
13. An automatic cardholder call-up feature shall allow the quick search and display of images in the database.
14. Logging

    a. All alarms and events in the SMS shall, by default, always be recorded in the database.

        1) System Administrators shall have the ability to select on a time zone basis, the times required for the SMS to log specific events to the database.
        2) System Administrators shall have the option for Alarm or Events to be set to log or not to log particular alarms or events by individual reader or input.

    b. A System Operator journal shall be available to log important daily events.

15. A trace function shall be available for System Operators to locate and track activity on specific cardholders, assets, video cameras, or card readers. An image comparison feature must be provided for use in conjunction with a CCTV interface.
16. The SMS shall support a Test Mode for Alarm Inputs, Door Forced Open, and Access Grants to verify that all inputs within the group are operational.

C. Intrusion Detection

1. The intrusion detection function shall employ keypad supplied from the Manufacturer – Bosch (or equal).
2. The Alarm Monitoring interface shall be able to control the intrusion detection function.
3. Intrusion zone point types:

    a. 24-hour point
    b. Interior point
    c. Perimeter point

4. Arming options:

    a. Exit delay
    b. Entry delay
    c. Forced

5. Actions under User command:

    a. Disarmed
    b. Disarmed Fault
    c. Armed Away
    d. Armed Stay

e. Armed Instant
f. Forced Armed Away
g. Force Armed Stay
h. Force Armed Instant
i. Entry Delay
j. Exit Delay
k. Alarm
l. After Alarm
m. Chime
n. Silence

6. System Administrators shall have the ability to define Alarm Mask Groups for sets of points to be treated as an intrusion area.

   a. Indication of events from these points shall be masked (disarmed) or unmasked (armed).

7. The SMS shall support Intrusion Mask Groups to contain individually configured intrusion points and to have the capability reporting of arming mode and state for the group.

   a. Within the configuration of the Intrusion Mask Group, the initial power up state of the Intrusion Mask Group shall be definable as one of the following states:

      1) Disarmed
      2) Armed Away
      3) Armed Stay
      4) Armed Stay Instant

8. Alarms shall be reported for the intrusion mask group by the SMS based on the current arming mode and state of the intrusion mask group.

D. Third Party Application Programming Interface (API)

1. Software Integrations

   a. Software integrations shall be based upon a RESTful Web Services API.
   b. Access control integrations shall provide for the following functionality:

      1) Full Alarm Management – Send, Receive and Acknowledge alarms via mobile application with biometric protection.
      2) Full identity/card management (add/modify/delete) identities, cards, visitors, access permissions, etc.
      3) Main command and control operations including - Set Reader modes
      4) Add/modify/delete of operator/user permissions of the system
      5) Access to device and other security system configuration (e.g. panels, readers, segments, badge types, etc.)
      6) API support for the same functions as used by manufacturer's browser clients, such that it is possible to implement the same features and functions as the manufacturer, but in custom applications or integrations.

2. Hardware Integrations

a. Hardware integration shall be based upon native API plug-ins that allow for 3rd parties to map their hardware into the access system to extend the supported device set including but not limited to, Fire, Intrusion, Intercom, Video, Cameras, Readers, etc.
b. Integration shall provide full support for alarms, hardware status, and command and control for integrating third-party devices into the alarm monitoring software
c. Video integration shall allow for both third-party video to be integrated into the SMS as well as SMS video to be accessed by a third-party

2.5 EXTENDED CAPABILITIES - The SMS shall allow for the inclusion of additional capabilities.

A. Advanced Unified Client

The SMS shall support an advanced unified client (AUC) application for the purpose of monitoring access control events and activity, digital video, and data from third party sources.

1. The AUC shall allow for customizable layouts of up to 400 cells.

a. Each cell can be populated with content, including the following content types:

1) Video streams
2) Automatic display and management of video related to alarms, including multiple video sources per alarm. Video replay controls shall be available.
3) Access control activity
4) Cardholder activity with images
5) Static images .jpg and .png
6) Video clips MP4 and MOV
7) Date and time
8) Weather
9) Traffic
10) Information from private and public RSS feeds
11) Twitter® feeds
12) Internet TV
13) Web content
14) Text
15) Maps
16) Content with door and camera objects overlayed, allowing status and door control

2. The AUC shall support the Windows® and macOS® operating systems.
3. The AUC shall support multiple monitors.
4. The AUC shall allow management of SMS events, including:

a. Display of linked cardholders and video recordings
b. Operator instructions

c. Acknowledgements
d. Marking in progress
e. Adding notes
f. Clearing completed events from the display

5. The AUC shall allow for display of recent activity of a cardholder linked to an access control transaction.
6. The AUC shall provide the ability to search for cardholder records in the SMS system, and to view, edit, and add cardholder records, based on the user's permissions on these systems.
7. The AUC shall support the ability to play backward, forward, pause, or capture a snapshot directly from the live video stream in an AUC cell.
8. The AUC shall allow for display of recorded video linked to access control transactions.
9. The AUC shall support forensic video searching and video exporting, video search by date and time, or by access control event (alarm).
10. The AUC shall support exporting video from one or more cameras. The video export shall support MOV and MPEG-4 file formats.
11. The AUC shall allow for display of access control and video information from the following sources:

    a. Supported SMS's

        1) LenelS2 OnGuard® version 7.5 or later

    b. Supported VMS's with event linking

        1) LenelS2 Network Video Recorder (LNVR) version 7.5 or later
        2) Milestone® XProtect® Systems Professional+ (2020-R2), Expert (2020-R2), and Corporate (2020-R2)

    c. Supported VMS's without SMS event linking

        1) LenelS2 NetVR™ version 1.7 or later
        2) Lenels2 VRx™ version 5.0 or later
        3) Avigilon® ACC5 and ACC6
        4) exacqVision® version 7.0 or later
        5) VideoInsight 7.9.0.503

B. Conversions and Migrations - Manufacturer shall offer the capability to migrate systems from the following manufacturers (equipment)

1. Mercury®
2. Honeywell®
3. GE Security® / Infographics® ACU
4. GE Security® / CASI® - M Series
5. Johnson Controls® - Tyco® (Software House®)

C. Visitor Management System

1. The SMS shall support an integral Visitor Management traditional client or browser-based client to provide the following functionality

D. Policy Compliance and Enforcement tool

1. The SMS shall have a browser-based analysis tool to ensure that the SMS is correctly configured to enforce corporate security policies.
2. A SMS policy manager shall be an application with the following capabilities:

a. Incorporate a flexible policy editor that allows the administrator to define complex security policies without having experience programming the SMS.
b. Allows or disallows exemptions on a per-policy basis.
c. Facilitates automatic or manual correction of policy violations.
d. Incorporates auditing and reporting capabilities to meet compliance in regulated industries.
e. Processes multiple violations simultaneously with bulk operations.

E. Web Access and Trending for Comprehensive Health Monitoring (WATCH)

1. The SMS shall provide a self-monitoring tool for SMS system application, database, and communications servers.

a. The monitoring tool shall constantly measure key performance indicators (KPI's) of the system servers, and provide a browser-based portal for viewing, analyzing, and understanding system operations.
b. An overview screen of SMS server operation shall be available, as shall individual screens for each server.
c. Monitoring shall default to a current-time view, with an option to specify a time window to understand system performance and metrics during the specified time window.
d. The SMS shall allow thresholds to be set for key performance indicators and for other system measurements and monitors, and for email notifications to be automatically generated when thresholds exceed or fall below configurable limits.
e. The SMS shall push relevant system health data to a cloud-based remote health monitoring site, providing automated notifications.

F. Cardholder Self Service browser-based portal

1. The SMS shall allow cardholders to log into a browser-based interface to self-execute common tasks, including:

a. Enrolling visitors and scheduling visits in the SMS visitor management system
b. Requesting access either from a list of allowed access levels and readers, or from a log of doors where access was attempted but denied.
c. Changing their cardholder PIN number for the SMS
d. Requesting a re-send of the cardholder's mobile credential

2. The Cardholder Self-Service tool shall generate email to notify approvers when access has been requested, and cardholders shall be notified automatically of the disposition of an access request.

3. It shall be possible for the system administrator to enable or disable each of the self-service capabilities listed above.

G. Console for Launching Common Functions

1. The SMS shall include a launcher application that can be used from a web browser and launch various components and modules of the SMS from a common location.

    a. The launcher application shall operate on a variety of platforms, including but not limited to Windows, Mac, and IOS, and shall feature a responsive user interface that adapts to the resolution, screen size, and aspect ratio of the device from which it is launched.
    b. When invoked from a Windows-based computer, the launcher application shall support both Windows applications and browser-based applications.
    c. Common applications shall be prepopulated in the launcher, but it shall be possible to integrate other browser-based applications by URL, to allow additional security application to be easily accessed by the operator.
    d. It shall be possible to rearrange the applications in the launcher on a particular device, and have that arrangement remembered automatically for future sessions.
    e. The launcher shall manage the login of system users, such that logging in to the launcher authenticates the logged in user for other system functions during that session.
    f. The launcher shall display available OnGuard clients, browser clients, and user selected reports and dashboards

H. Smartphone-based Mobile Credential Support

1. The SMS user screens shall include the ability to issue, modify and revoke smartphone-based mobile credentials. Solutions requiring “dual-enrollment” of mobile credentials in a cloud or web app as well as the SMS are not acceptable.
2. The SMS shall use a cloud-based mobile credential issuance and management mechanism to allow for shared mobile credential accounts, use of various or mixed mobile credential ecosystems, and updates to mobile credential support without updating the installed SMS software.
3. The system shall have the ability to create a custom email template that will be sent to the cardholder.

    a. Email shall include link to download the mobile credential application, instructions to install and configure the mobile app, and a one-time password to authenticate the mobile application to the credential server.

4. A System Administrator with appropriate user permissions shall have the ability to create a friendly name for each mobile reader, to be displayed in the mobile app.

I. Third Party Integrations

1. The SMS shall support multiple certified integrated third-party interfaces with hardware and software vendors to include the following functional areas:

    a. Command and control

b. Communications
c. Elevator
d. Fire alarm
e. Identity and access management
f. Intercom
g. Intrusion detection and alarm
h. IP video cameras
i. Key management
j. License plate recognition
k. Monitoring and dispatching
l. RFID
m. Readers
n. Recording appliances
o. Sensor inputs
p. Time and attendance
q. Video analytics
r. Video management systems

2. Specifically, required integrations are as follows:

   a. List required vendor integrations available at: http://www.lenel.com/solutions/open-integration/oaap/partners-products-search

3. The SMS shall provide a set of standard RESTful Web Services Application Programming Interfaces (API's) and supporting documentation that allows hardware manufacturers and software application developers to interface their products into the SMS.
4. Third party interfaces shall be integrated to provide a single graphical user interface, single source code base, and a single database for configuration, alarm, and event storage.

   a. The SMS shall allow alarms and events from the third-party systems to report into the same main Alarm Monitoring window as access control alarms.
   b. Third-party hardware alarms and events shall be stored in the SMS database for audit trail and reporting purposes.

5. Data available through these interfaces shall be organized for optimum performance with one application accessing a single bank of data.
6. Any changes to system hardware shall be instantly available across the entire SMS.

J. The SMS shall support OPC, BACnet and SNMP protocols.

1. An industry standard OPC Server utility shall allow the export of SMS alarms and events to industry standard OPC Clients.

2.6 COMMUNICATIONS

A. The SMS shall communicate with the ISCs via TCP/IP through IPv4 or IPv6 protocols. The network connection shall be configurable to be initiated either by the system to the controller in the field, or from the controller in the field to system.

1. In the case where all field deployed devices are with private network boundaries, the preferred connection is from the system to controller.
2. In the case where field deployed controllers are outside the private network, and use the public internet for connection, then controllers should initiate connection to the system.
3. The system shall be capable of supporting both communications methods within the same overall system.

B. Download communication between the SMS and the ISC shall be fully multi-tasking and shall not interfere with operational functions.

C. Upon loss of communications between the SMS Server and an ISC, an alarm shall be created with a time stamp.

1. Upon re-established communication, the SMS and the ISC shall automatically re-synchronize from the point of communication loss without operator intervention.
2. The SMS shall support Dual Path communications between the SMS Server and the ISC's to allow for a fully functional redundant communication path.

a. During a fail over period, the ISC shall periodically check to see if the primary path has been re-established and will automatically switch back upon a successful connection.
b. Alarms shall be generated upon loss or restoration of communications.

D. Encryption - The SMS shall provide encrypted communication capabilities as follows:

1. Credentials to Reader: DESFire EV1 or EV2, or HID iCLASS or SEOS
2. Reader to Downstream Panels: OSDP Secure Channel Encryption
3. Downstream Panels to ISC: AES-128 bit or AES-256 bit
4. Data on ISC AES-256 bit Encryption of Data at Rest
5. ISC to SMS Server: AES-128 bit or TLS1.2 with AES-256 bit
6. SMS Server to Client: HTTPS
7. Client to Printers and Badge Encoders: Encrypted encoder communications

2.7 SYSTEM MANAGEMENT

A. System Configuration - The SMS shall provide system icons and/or menu selections for each function requiring configuration of SMS options or peripherals including client workstations, field hardware, network functions, communications, and reports.

1. A set-up assistant utility shall be available for the initial system configuration prior to first log in.
2. The SMS shall support configuration setup wizards to guide System Administrators through the configuration of the access control module of the system.

B. In addition to capabilities previously mentioned herein, System Administration capability shall include the following:

1. Customize cardholder, asset, and visitor forms.

2. Import customized map backgrounds and custom icons.
3. Bulk delete cardholder records.
4. Limit System Operator functions and actions, including searching the database.
5. Configure client workstation applications and settings.
6. Assign System Operator passwords, log on credentials and permissions and provide operator history.

C. The SMS shall provide support for single sign-on capability, whereby System Administrators or System Operators may authenticate into SMS applications using their Windows domain account.

D. System Administrative tasks including defining client workstation and Operator permissions, access groups, time zones, reports, and maps shall be available from any client workstation on the network.

E. Graphical Features

1. The SMS shall display a graphical representation of configured field hardware (including ISCs, fire panels, intrusion detection devices, personal safety devices, intercom systems, and Central Station alarm receivers), digital video hardware, access levels, time zones, access groups, holidays, and card formats.
2. System Administrators shall be able to modify a device that is depicted on the graphical system overview tree or see its properties by double-clicking on the related icon, causing the SMS to bring them to the appropriate form.

F. The SMS shall provide context-sensitive help files to guide System Administrators and System Operators in configuration and operation.

1. Logging - The SMS shall provide full System Operator activity tracking/logging of critical keyboard functions to include date/time, Operator, activity program, function, and database changes.

    a. System Operator functions to log shall include System Operator login and System Operator logout; Additions, Changes, and Deletions to Cardholder Management; New Badge, Print Badge, and Update Badge.
    b. Configuration changes to log shall include all functional modules within the SMS.

G. The SMS shall log activity of System Operators performing SMS alarm monitoring including alarms acknowledged, alarms cleared, output control activity, trace, and other functions.

H. Reporting - The SMS shall provide rich reporting of system data.

1. The SMS shall support an industry standard, off the shelf, custom report writer, allowing the creation of custom reports.
2. Capability shall be provided to view, export, schedule, email, print and modify reports through a web browser, including the ability to add user-defined fields to a report.
3. Reports are stored on the SMS and are able to be viewed from client workstations or web browsers with proper permissions and network access.
4. The SMS shall allow reports to be generated manually or based on system events or user-defined schedules.

I. Archiving - The SMS shall allow System Administrators to archive offline history files. Offline files shall include access events and System Operator transactions that have been purged from the reportable database.

2.8 HARDWARE REQUIREMENTS

A. The Manufacturer shall publish a summary of recommended server hardware to accommodate the performance requirements of the SMS server software.

B. The SMS server software shall be capable of running in a virtual or cloud environment.

PART 3 - EXECUTION

3.1 INSTALLERS

A. Contractor installation personnel shall be trained and certified by the SMS manufacturer and have a valid, current certification at the time of installation.

B. Contractor installation personnel shall comply with all applicable state and local licensing requirements.

3.2 PREPARATION

A. The network design and configuration shall be verified for compatibility and performance with the SMS.

B. The network configuration shall be tested and qualified by the Contractor prior to system installation.

C. Server performance

D. parameters shall be compared with Manufacturer requirements for the SMS.

3.3 INSTALLATION OF ACCESS CONTROL SYSTEM

A. Description: Access control system provides a means of regulating or controlling physical entry into an area, or access to or use of a device by electrical, electronic, and/or mechanical means. Typical access control system includes a card reader at a controlled door, which reads a user credential and sends the collected data to a centrally located DGP over the cabling infrastructure. DGP may hold a user database onboard or may communicate with a user database over the network. If user is authorized for access at a controlled door, DGP signals the electronic lock at the door to unlock. If user credential is not authorized according to user database, the door remains locked and access is denied. In addition to card readers and electronic locks, access control systems may include various other connected devices programmed for a desired function.

B. Performance Criteria:

1. Regulatory Requirements:

    a. Components listed and labeled in accordance with NFPA 70 and NFPA 72, by qualified electrical testing laboratory recognized by authorities having jurisdiction, and marked for intended location and application.
    b. Comply with NFPA 1, NFPA 730, NFPA 731, and ICC IBC.
    c. Certification: Provide certificate, authorized under UL Certification Service, that access control system installation complies with installation requirements of UL CCN ALOV.

2. Listing Criteria: UL CCN ALOV and UL CCN ALVY; including UL 294.
3. Consult Architect for resolution of conflicting requirements.

C. Selection of Access Control System Components:

1. Source Limitations: Obtain components for access control system from sources approved by manufacturer warranting performance of entire system.
2. Provide the following specified products with the access control system:

    a. Access Control Software and Database Management:

        1) Access control system unit operating system software.
        2) Access control system unit antivirus and security protection software.
        3) Visitor management database software.
        4) Mobile credential validation database software.
        5) Access control system supplementary computer equipment operating system software.
        6) Access control system supplementary computer equipment antivirus and security protection software.
        7) Credential card personalization software.
        8) Credential card printer and encoder software.

    b. Access Control System Hardware:

D. Special Techniques:

1. Comply with manufacturer's published instructions.
2. Mounting Heights: Mount field devices in accessible locations in accordance with United States Access Board ADA-ABA Accessibility Guidelines standards.
3. Wiring Methods:

    a. Backbone Cable Type: Single-mode fiber or multi-mode fiber or copper.
    b. Cable Type: Shielded.
    c. Analog Maximum Cable Length: 1000 ft.
    d. Digital Maximum Cable Length: 300 ft.

E. Interfaces with Other Work:

1. Coordinate installation of new access control system components with existing conditions.

2. Coordinate with applicable Division 08 Sections for interfacing access control system devices with door hardware.

F. Contractor shall follow manufacturer published installation and configuration instructions and guidelines.

G. System shall be configured in accordance with manufacturer-supplied hardening guide. SMS systems for which the manufacturer does not provide a hardened installation option shall not be acceptable.

H. Systems installed in a cloud environment shall be configured in accordance with manufacturer-supplied guidelines outlined in a cloud deployment guide. SMS systems for which the manufacturer does not provide a cloud deployment option shall not be acceptable.

3.4 FIELD QUALITY CONTROL OF ACCESS CONTROL SYSTEM COMPONENTS

A. Field tests and inspections must be witnessed by Architect, CCAC, and authorities having jurisdiction.

B. Tests and Inspections:

1. Perform manufacturer's recommended tests and inspections for access control system components.
2. Perform industry standard tests and inspections for power supplies, batteries, and other standby power provisions.
3. Engage factory-authorized service representative to test end-to-end system connection and functionality.
4. Verify monitoring of access control system status and diagnostics information.

C. Nonconforming Work:

1. Access control equipment will be considered defective if it does not pass tests and inspections.
2. Remove and replace defective units and retest.

D. Collect, assemble, and submit test and inspection reports.

E. Manufacturer Services:

1. Engage factory-authorized service representative to support field tests and inspections.

3.5 SYSTEM STARTUP

A. Engage a factory-authorized service representative to perform startup service.

1. Complete installation and startup checks in accordance with manufacturer's published instructions.

3.6 ADJUSTING

A. Control Sensor Adjustments: Adjust control devices to suit actual occupied conditions.

1. For proximity motion sensors, verify operation at outer limits of detector range. Set time delay to suit Owner's operations.

3.7 Storage

A. Server and system hardware devices and components shall be stored in an environment where temperature and humidity are in the range specified by the Manufacturer.

3.8 PROTECTION

A. After installation, protect access control system components from construction activities. Remove and replace items that are contaminated, defaced, damaged, or otherwise caused to be unfit for use prior to acceptance by Owner.

3.9 MAINTENANCE

A. Control Sensor Readjustments: When requested within 12 months from date of Substantial Completion, provide on-site assistance in readjusting system to suit actual occupied conditions. Provide up to two visits to Project during other-than-normal occupancy hours for this purpose.

END OF SECTION

CCAC
HOMEWOOD BRUSHTON CENTER

DOORS, HARDWARE & ACCESS CONTROLS
PHASE 1 - HOMEWOOD BRUSHTON CENTER

701 N. HOMEWOOD AVE.
PITTSBURGH, PA 15208

0 3/25/2025 - ISSUED FOR PERMIT

LLI ENGINEERING
1501 PREBLE AVENUE, SUITE 300 PITTSBURGH, PA 412-904-4310

[redacted]

ARCHITECTURAL

SHEET NUMBER	DRAWING TITLE
A-H-001	CCAC CAMPUS SITES
A-H-101	HOMEWOOD BRUSHTON CENTER - FIRST FLOOR PLAN
A-H-102	HOMEWOOD BRUSHTON CENTER - DETAILS

ELECTRICAL

SHEET NUMBER	DRAWING TITLE
E-H-001	ELECTRICAL GENERAL NOTES, SYMBOLS AND DETAILS
E-H-100	HOMEWOOD BRUSHTON CENTER - FIRST FLOOR PLAN

LLI ENGINEERING
1501 PREBLE AVENUE, SUITE 300 PITTSBURGH, PA 15233 412-904-4310

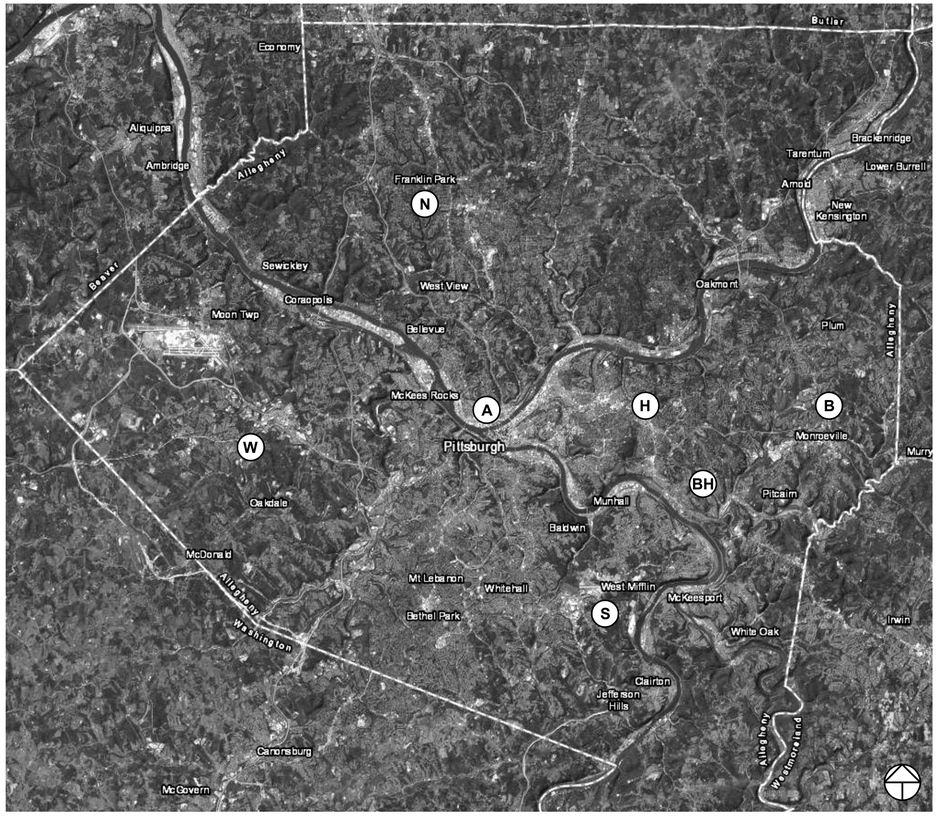
COMMUNITY COLLEGE OF ALLEGHENY COUNTY
DOORS, HARDWARE & ACCESS CONTROLS
PHASE 1- HOMEWOOD BRUSHTON CENTER
701 N HOMEWOOD AVE.
PITTSBURGH, PA 15208

NO.	REVISION	DATE
0	ISSUED FOR PERMIT	3/25/2025

PLOT DATE
SCALE
DRAWN BY RDB
CHECKED BY MPB
LLI PROJ # 20240018
ISSUE DATE 11/7/2024

DRAWING TITLE
COVER SHEET

DRAWING NUMBER
CS-H



1 CCAC SITES
N.T.S.

CAMPUS KEY

- (A) ALLEGHENY CAMPUS (SEE SHEET A-A001 FOR BUILDING KEY)
- (B) BOYCE CAMPUS
- (BH) BRADDOCK HILLS CENTER
- (H) HOMEWOOD BRUSHTON CENTER
- (N) NORTH CAMPUS
- (S) SOUTH CAMPUS (SEE SHEET A-S001 FOR BUILDING KEY)
- (W) WEST CAMPUS

ALLEGHENY CAMPUS
808 RIDGE AVENUE, PITTSBURGH, PA 15212

BOYCE CAMPUS
595 BEATTY ROAD, MONROEVILLE, PA 15146

BRADDOCK HILLS CENTER
250 YOST BOULEVARD, BRADDOCK HILLS, PA 15221

HOMEWOOD BRUSHTON CENTER
701 NORTH HOMEWOOD AVE, PITTSBURGH, PA 15208

NORTH CAMPUS
8701 PERRY HIGHWAY, PITTSBURGH, PA 15237

SOUTH CAMPUS
1750 CLAIRTON ROAD, WEST MIFFLIN, PA 15122

WEST CAMPUS
1000 MCKEE ROAD, OAKDALE, PA 15071

SHEET NUMBERING KEY

A - X - X 101

- SHEET NUMBER
- BUILDING DESIGNATION (SEE CAMPUS BUILDING KEY)
- CAMPUS DESIGNATION (SEE CAMPUS KEY)
- DISCIPLINE

DOOR NUMBERING KEY

AT CAMPUSES WITH MULTIPLE BUILDINGS
(ALLEGHENY AND SOUTH CAMPUSES)

X 1 - 101

- DOOR NUMBER
- BUILDING DESIGNATION (SEE CAMPUS BUILDING KEY)
- CAMPUS DESIGNATION (SEE CAMPUS KEY)

AT CAMPUSES WITH ONE BUILDING

X - 101

- DOOR NUMBER
- CAMPUS DESIGNATION (SEE CAMPUS KEY)

LLI ENGINEERING
1501 PREBLE AVENUE, SUITE 300 PITTSBURGH, PA 15233 412-904-4310

COMMUNITY COLLEGE OF ALLEGHENY COUNTY
DOORS, HARDWARE & ACCESS CONTROLS
PHASE 1- HOMEWOOD BRUSHTON CENTER
701 N HOMEWOOD AVE.
PITTSBURGH, PA 15208

NO.	DATE	REVISION
0	3/25/2025	ISSUED FOR PERMIT

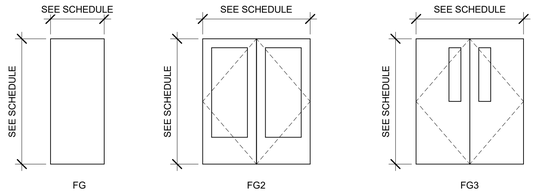
PLOT DATE
SCALE: As indicated
DRAWN BY: RDB
CHECKED BY: MPB
LLI PROJ.#: 20240018
ISSUE DATE: 11/7/2024

DRAWING TITLE
CCAC CAMPUS SITES

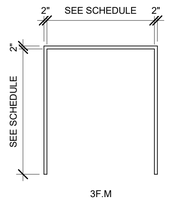
DRAWING NUMBER
A-H-001

DOOR SCHEDULE

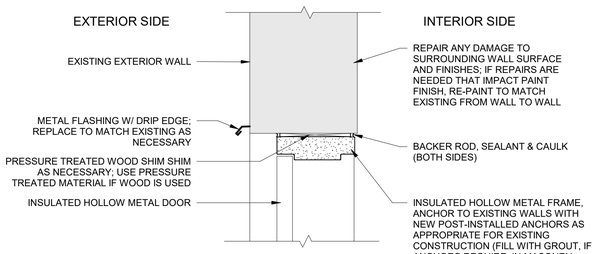
MARK	PANEL TYPE	PANEL MATERIAL	PANEL FINISH	FRAME TYPE	FRAME MATERIAL	FRAME FINISH	VISION LIGHT	SIZE	THICKNESS	HARDWARE SET	COMMENTS
H101	FG2	Hollow Metal	MATCH EXISTING	3F.M	Hollow Metal	MATCH EXISTING	YES	6' - 8" x 6' - 0"	0' - 1 3/4"	1.0	PRIMARY ENTRANCE DOOR
H102	F	Hollow Metal	MATCH EXISTING	3F.M	Hollow Metal	MATCH EXISTING	NO	6' - 8" x 3' - 4"	0' - 1 3/4"	3.0	EGRESS ONLY DOOR AT STAIR
H103	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	EXISTING	N/A	8' - 0" x 8' - 6"	0' - 3"	4.0	ROLL-UP DOOR. ALL EXISTING HARDWARE TO REMAIN. ONLY THE POSITION SWITCH IS TO BE ADDED OR REPLACED.
H104	FG3	Hollow Metal	MATCH EXISTING	3F.M	Hollow Metal	MATCH EXISTING	YES	7' - 0" x 5' - 0"	0' - 1 3/4"	2.0	EGRESS ONLY, DOUBLE DOOR



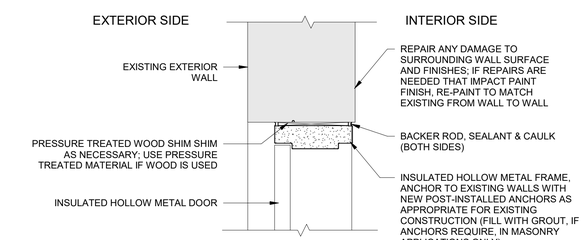
DOOR TYPES
1/4" = 1'-0"



FRAME TYPES
1/4" = 1'-0"



H.M. DOOR HEAD DETAIL @ EXTERIOR WALL
2 1 1/2" = 1'-0"



H.M. DOOR JAMB DETAIL @ EXTERIOR WALL
3 1 1/2" = 1'-0"

HARDWARE SCHEDULE

MANUFACTURER LIST

BE	BEST LOCKS & CLOSERS
MK	MCKINNEY
NO	NORTON
OT	OTHER
PE	PEMKO
RO	ROCKWOOD
SA	SARGENT
SU	SECURITRON

SET 1.0

QTY.	ITEM	DESCRIPTION	FINISH	MFR.
6	HINGE, FULL MORTISE, HVY WT	T4A3386 (NRP)	US32D	MK
2	ELECTRIC POWER TRANSFER	EL-CEPT	630	SU
1	MULLION	L980S	PC	SA
1	RIM EXIT DEVICE, STOREROOM	16 55 56 72 8804 862RIM EXIT 55	US32D	SA
1	RIM EXIT DEVICE, EXIT ONLY	8810 EO	US32D	SA
1	MULLION CYLINDER KIT	72 980C1	US26D	SA
3	KEYED CORE	BY OWNER	626	BE
1	SURFACE CLOSER	CPS7500	689	NO
1	AUTOMATIC OPENER	6300 Series	689	NO
2	KICK PLATE	K1050 10" H. x CSK BEV	US32D	RO
2	ASTRAGAL	297AS TKSP		PE
1	RAIN GUARD	346C TKSP		PE
1	MULLION GASKETING	5110BL		PE
1	GASKETING	S773BL x Head and Jambs		PE
2	SWEEP	3452CNB TKSP		PE
1	THRESHOLD	271A MSES2SSS		PE
2	ELECTROLYNX FRAME HARNESS	QC-C1500P		MK
2	ELECTROLYNX DOOR HARNESS	QC-C1500P		MK
1	WIRING DIAGRAM	WD-SYSPK		SA
1	CARD READER	By Division 28		OT
2	DOOR SWITCH	505		NO
2	POSITION SWITCH	DPS-M-BK		SU
1	POWER SUPPLY	AQD4-8C8R2		SU

NOTES: OPERATIONAL NARRATIVE:
1. DOORS NORMALLY CLOSED AND SECURE.
2. AUTHORIZED ACCESS BY CARD READER RETRACTING EXIT DEVICE LATCHES FOR PREDETERMINED TIME LIMIT. EXIT DEVICE LATCHES CAN BE ELECTRICALLY HELD RETRACTED FOR OPEN ACCESS.
3. ADA ACCESS BY ACTUATOR SWITCH. IN LOCKED CONDITION, ACTUATOR ENERGIZED ONLY UPON VALID CARD READER PRESENTATION.
4. EGRESS FREE FOR IMMEDIATE EXIT. ADA EGRESS BY ACTUATOR SWITCH.
5. REX SWITCH IN PUSH RAIL ALLOWS AUTHORIZED EXIT WITHOUT ALARM CONDITION.
6. DOOR POSITION SWITCHES MONITOR OPEN/CLOSED STATUS.
7. EXIT DEVICE LATCHES RELEASE (FAIL SECURE) IN EVENT OF POWER LOSS. KEYED CYLINDER OVERRIDE FOR EMERGENCY ACCESS.

SET 2.0

QTY.	ITEM	DESCRIPTION	FINISH	MFR.
6	HINGE, FULL MORTISE, HVY WT	T4A3386 (NRP)	US32D	MK
2	ELECTRIC POWER TRANSFER	EL-CEPT	630	SU
1	MULLION	L980S	PC	SA
1	RIM EXIT DEVICE, STOREROOM	16 55 56 72 8804 862	US32D	SA
1	RIM EXIT DEVICE, EXIT ONLY	55 8810 EO	US32D	SA
1	MULLION CYLINDER KIT	72 980C1	US26D	SA
3	KEYED CORE	BY OWNER	626	BE
2	SURFACE CLOSER	CPS7500	689	NO
2	KICK PLATE	K1050 10" H. x CSK BEV	US32D	RO
2	ASTRAGAL	297AS TKSP		PE
1	RAIN GUARD	346C TKSP		PE
1	MULLION GASKETING	5110BL		PE
1	GASKETING	S773BL x Head and Jambs		PE
2	SWEEP	3452CNB TKSP		PE
1	THRESHOLD	271A MSES25SS		PE
2	ELECTROLYNX FRAME HARNESS	QC-C1500P		MK
2	ELECTROLYNX DOOR HARNESS	QC-C**P		MK
1	WIRING DIAGRAM	WD-SYSPK		SA
1	CARD READER	By Division 28		OT
2	POSITION SWITCH	DPS-M-BK		SU
1	POWER SUPPLY	AQD4-8C8R2		SU

NOTES: OPERATIONAL NARRATIVE:
1. DOORS NORMALLY CLOSED AND SECURE.
2. AUTHORIZED ACCESS BY CARD READER RETRACTING EXIT DEVICE LATCHES FOR PREDETERMINED TIME LIMIT. EXIT DEVICE LATCHES CAN BE ELECTRICALLY HELD RETRACTED FOR OPEN ACCESS.
3. EGRESS FREE FOR IMMEDIATE EXIT.
4. REX SWITCH IN PUSH RAIL ALLOWS AUTHORIZED EXIT WITHOUT ALARM CONDITION.
5. DOOR POSITION SWITCHES MONITOR OPEN/CLOSED STATUS.
6. EXIT DEVICE LATCHES RELEASE (FAIL SECURE) IN EVENT OF POWER LOSS. KEYED CYLINDER OVERRIDE FOR EMERGENCY ACCESS.

SET 3.0

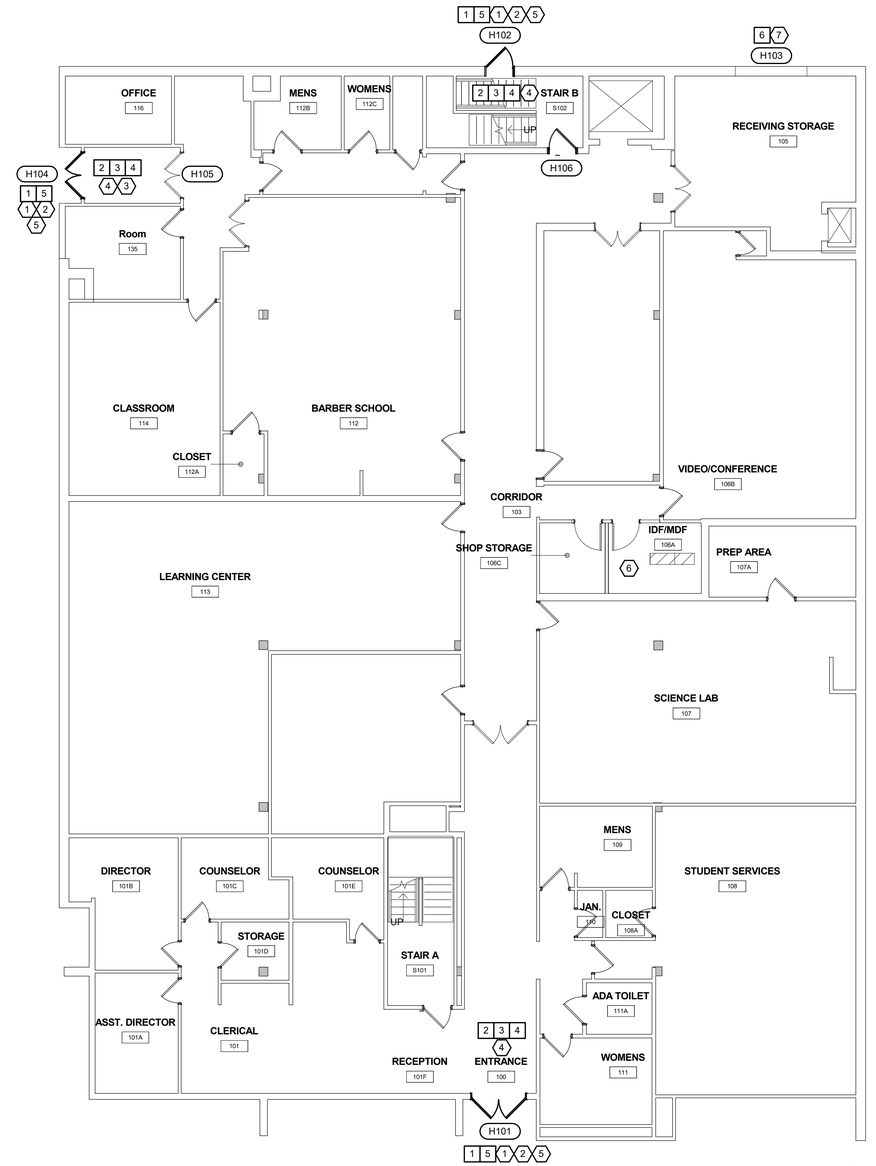
QTY.	ITEM	DESCRIPTION	FINISH	MFR.
3	HINGE, FULL MORTISE, HVY WT	T4A3386 (NRP)	US32D	MK
1	RIM EXIT DEVICE, EXIT ONLY	8810 EO	US32D	SA
1	SURFACE CLOSER	CPS7500	689	NO
1	KICK PLATE	K1050 10" H. x CSK BEV	US32D	RO
1	RAIN GUARD	346C TKSP		PE
1	GASKETING	S773BL x Head and Jambs		PE
1	SWEEP	3452CNB TKSP		PE
1	THRESHOLD	271A MSES25SS		PE
1	POSITION SWITCH	DPS-M-BK		SU

NOTES: OPERATIONAL NARRATIVE:
1. DOORS NORMALLY CLOSED AND SECURE.
2. EGRESS ONLY. NO OUTSIDE DOOR TRIM.
3. DOOR POSITION SWITCH MONITORS OPEN/CLOSED STATUS.

SET 4.0

QTY.	ITEM	DESCRIPTION	FINISH	MFR.
1	POSITION SWITCH	DPS-M-BK		SU

NOTES:
ALL OTHER HARDWARE EXISTING TO REMAIN



NOTE: FLOOR PLAN PROVIDED BY OWNER AND INTENDED TO SHOW DOOR LOCATIONS ONLY. EXISTING CONDITIONS WERE NOT SURVEYED OR UPDATED.

1 FIRST FLOOR
1/8" = 1'-0"

DEMOLITION NOTES:

1. CONTRACTOR TO PROVIDE ADEQUATE SIGNAGE AND PEDESTRIAN BARRIER PROTECTION DURING ALL EXTERIOR CONSTRUCTION.
2. ERECT DUST/EQUIPMENT PARTITIONS AS REQUIRED SEPARATING WORK AREAS FROM EQUIPMENT AND AREAS THAT REMAIN OCCUPIED DURING CONSTRUCTION. REFER TO DETAIL 2/A-H-102. PROTECT DUCTWORK IN WORK AREAS FROM DUST. COORDINATE WITH HVAC CONTRACTOR AS NECESSARY TO PREVENT BALANCING ISSUES DURING TEMPORARY PROTECTION AND AGAIN WHEN PROTECTION IS REMOVED.
3. RELOCATE ANY FURNITURE OR ANY OTHER ITEMS THAT MIGHT BE IN THE WAY OF NEW WORK. COORDINATE ANY RELOCATIONS WITH OWNER OR OWNER'S REP.
4. PROVIDE TEMPORARY PROTECTIVE FLOOR COVERING OVER EXISTING FLOORING WHERE NEEDED FOR THE DURATION OF CONSTRUCTION. ANY DAMAGED FLOORING TO REMAIN TO BE REPLACED AT NO EXPENSE TO OWNER.
5. REMOVE EXISTING DOOR, DOOR FRAME AND HARDWARE.
6. REMOVE EXISTING POSITION SWITCH AT OVERHEAD DOORS IF APPLICABLE. COORDINATE WITH ELECTRICAL DRAWINGS.

NEW WORK NOTES:

1. NEW DOOR AND HARDWARE. REFER TO DOOR SCHEDULE. COORDINATE WITH ELECTRICAL PLANS AS REQUIRED.
2. PATCH ANY HOLES IN CONCRETE FLOOR SLAB & ADJACENT WALLS FROM FRAME REMOVAL TO MATCH EXISTING ADJACENT CONDITIONS. PAINT WALLS TO MATCH EXISTING ADJACENT CONDITIONS.
3. IF EXISTING CARPET IS DAMAGED IN DOOR REMOVAL AND REPLACEMENT, REPLACE CARPET TO MATCH EXISTING.
4. REMOVE DUST PARTITION AND OTHER PROTECTIVE MATERIAL AND CLEAN FLOOR AND WALL SURFACES ALL AROUND CONSTRUCTION AREA AFTER WORK IS COMPLETE. TOUCH-UP PAINT AS REQUIRED.
5. AFTER WORK IS COMPLETE REMOVE ANY CONSTRUCTION SIGNAGE, PEDESTRIAN PROTECTION AND MISCELLANEOUS CONSTRUCTION DEBRIS CLEAN AND RETURN AREA TO ITS PRE-CONSTRUCTION CONDITION.
6. FOR NEW ELECTRICAL WORK THAT MAY REQUIRE NEW CONDUIT PENETRATIONS, REFER TO DETAIL 1/A-H-102 FOR FIREPROOFING.
7. NEW POSITION SWITCH AT OVERHEAD DOORS, REFER TO DOOR SCHEDULE AND COORDINATE WITH ELECTRICAL DRAWINGS.
8. REPLACE ALL DOOR OPERATOR HARDWARE INCLUDING PUSH-BUTTONS AND WIRING WITH MATCHING PUSH BUTTON KIT BY POWER OPERATOR MANUFACTURER. MATCH EXISTING FINISH AT BUTTON (BLUE OR STAINLESS STEEL) AS OCCURS IN FIELD.

SHEET NOTES:

1. COORDINATE ALL WORK WITH ARCHITECTURAL DRAWINGS AND SPECIFICATIONS.
2. DO NOT SCALE DRAWINGS.
3. ACCESSIBILITY DIMENSIONS ARE SHOWN FOR REFERENCE ONLY. INSTALL ALL FIXTURES AND ACCESSORIES IN ACCORDANCE WITH ABAAS, ANSI A117.1 AND OTHER APPLICABLE ACCESSIBILITY CODES.
4. CONSTRUCTION SIGNAGE TO BE POSTED DURING THE PROJECTS CONSTRUCTION.
5. CONTRACTOR TO PATCH AND/OR PAINT WALLS AND/OR FLOORS AT ANY ELECTRICAL REMOVALS.

REGISTERED ARCHITECT
COMMONWEALTH OF PENNSYLVANIA
BRIAN SIMON
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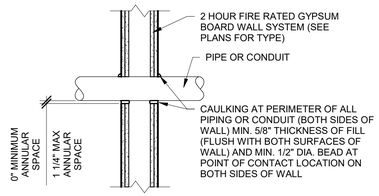
COMMUNITY COLLEGE OF ALLEGHENY COUNTY
DOORS, HARDWARE & ACCESS CONTROLS
PHASE 1- HOMEWOOD BRUSHTON CENTER
701 N HOMEWOOD AVE.
PITTSBURGH, PA 15208

REVISION	DATE	NO.
ISSUED FOR PERMIT	3/25/2025	0

PLOT DATE	
SCALE	As Indicated
DRAWN BY	RDB
CHECKED BY	MPB
LLI PROJ.#	2024001B
ISSUE DATE	11/7/2024

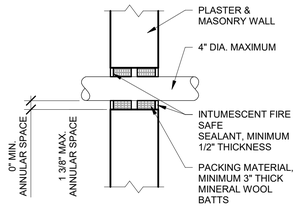
DRAWING TITLE
HOMEWOOD BRUSHTON
CENTER - FIRST FLOOR PLAN

DRAWING NUMBER
A-H-101



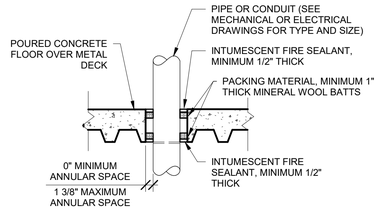
PIPE OR CONDUIT PENETRATION-WALL

ALL WORK TO BE DONE IN ACCORDANCE WITH UL SYSTEM NO. W-L-1146 - 2 HOUR FIRE RATING NOTE: SINGLE LAYER OF DRYWALL SIMILAR



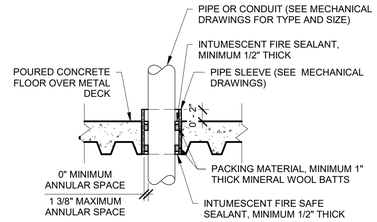
PIPE OR CONDUIT PENETRATION-WALL

THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. C-AJ-1152 - 2 HR FIRE RATING



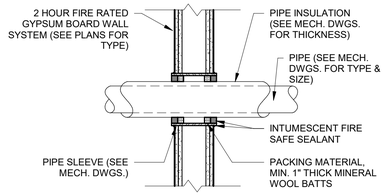
PIPE OR CONDUIT PENETRATION-FLOOR SLAB

THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. C-AJ-1175 - 2 HOUR FIRE RATING



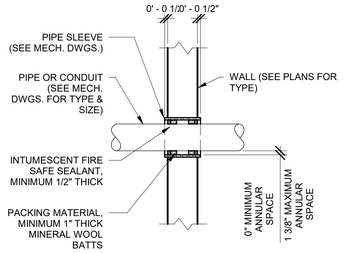
SLEEVED PIPE OR CONDUIT PENETRATION-FLOOR SLAB

THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. C-AJ-1175 - 2 HOUR FIRE RATING



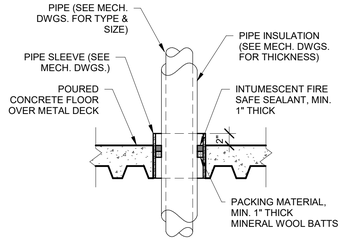
INSULATED SLEEVE PIPE PENETRATION - WALL

THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. C-AJ-5001 - 2 HOUR FIRE RATING



SLEEVED PIPE OR CONDUIT PENETRATION

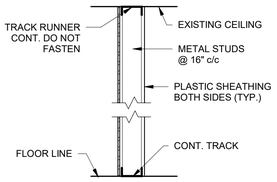
THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. C-AJ-1175 - 2 HR FIRE RATING



INSULATED PIPE PENETRATION - FLOOR SLAB

NOTE: THIS SYSTEM IS INTENDED TO BE SIMILAR TO UL SYSTEM NO. W-L-5011 - 2 HOUR FIRE RATING

1 TYPICAL FIREPROOFING DETAILS
1" = 1'-0"



NOTES:

1. G.C. TO PROVIDE CONSTRUCTION DOOR, WHERE REQUIRED.
2. CONSTRUCT A TEMPORARY DUST-PROOF CONSTRUCTION BARRIER USING ANTI-STATIC FIRE RETARDANT PLASTIC SHEATHING FROM FLOOR TO CEILING ABOVE. BARRIER IS TO REMAIN IN PLACE UNTIL CONSTRUCTION IS COMPLETED. COORDINATE LOCATION WITH OWNER'S REPRESENTATIVE.

2 DUST PARTITION DETAIL
1 1/2" = 1'-0"

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DRAWING TITLE
HOMEWOOD BRUSHTON CENTER - DETAILS

DRAWING NUMBER
A-H-102