

PROPOSAL FORM
BALTIMORE COUNTY
DEPARTMENT OF PUBLIC WORKS & TRANSPORTATION
TOWSON, MARYLAND

Division of Construction Contracts Administration

Architect

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Contract Number 25122 PO0
Property Management Project
Baltimore County Detention Center Lobby Renovations –
720 Bosley Avenue, Towson, Maryland 21204
Towson – District 9c6
Workday Number
PROJ-10001187

CONTRACT BASED ON SEPTEMBER 2023
STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MATERIALS
AND STANDARD DETAILS FOR CONSTRUCTION

Bidders Information

A pre-bid meeting will be held on Wednesday, October 22, 2025 at 11:00 a.m. EST via WebEx. *Phone-In* (Audio Only) 1-415-655-0001, Meeting Number 2301 765 7029##. *Video Conference* go to <https://signin.webex.com/join> Meeting Number 2301 765 7029, **Password: euMYN2wQH52**, for Webex link go to: www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations. A site visit is scheduled for Friday, October 10, 2025 at 9:00 A.M. – 12:00 P.M. EST.

Baltimore County Prevailing Wage & Local Hiring Affidavit, Requirements & Wage Rates **see pages 466-473.**

(Contract Disclosure): “Wage rates that are in effect as of the contract solicitation date will be the wage rates through the duration of the project”

MBE/WBE Requirements & Forms **see pages 474-488**

THIS PROPOSAL FORM INCLUDES AND INCORPORATES ALL DOCUMENTS AND INFORMATION REFLECTED, LISTED, AND/OR REFERENCED IN THIS TABLE OF CONTENTS, AND ALL SUCH DOCUMENTS AND INFORMATION ARE PART OF AND INCORPORATED INTO THE CONTRACT DOCUMENTS.

TABLE OF CONTENTS

<u>Section Number</u>	<u>SECTION NAME</u>	<u>Page Number</u>
	Title Page (cover)	1
	Table of Contents	2
I.	INFORMATION FOR BIDDERS	3-6
II.	SPECIAL PROVISIONS	7-454
	(General Provisions)	(11-12)
	(General Conditions)	(13-42)
III.	PERMITS.....	455
IV.	PROPOSAL (This section to be completed at time of bid)	456
	Description of Work	457
	Description of Items & Schedule of Prices	458
	Proposal Affidavit	459-464
	Bid Bond	465
	Baltimore County Prevailing Wage and Local Hiring Affidavit, Requirements & Wage Rates	466-473
	MBE/WBE Requirements and Forms	474-488
V.	POST AWARD DOCUMENTS (This Section to be completed by successful bidder after award)	489
	Contract Agreement	490-492
	Performance Bond	493
	Payment Bond	494
	Insurance Documents	495

SECTION I

INFORMATION FOR BIDDERS

ELECTRONIC SUBMITTAL PROCESS

To be considered, Bids (Section IV – Proposal) shall be received by the bid closing date and time to the following email address dpwbid@baltimorecountymd.gov. The contract number and company name should be referenced in the Subject Line of the email. Bids may not be submitted by any other means. Bids that are mailed or otherwise delivered to the Purchasing Division (including emails which indicate links to locations where the bid may be downloaded) and/or emails sent to any other Baltimore County email address will not be accepted.

Late Bids will not be considered. Bidders are strongly encouraged not to wait until the last minute to submit bids. The time stated on the auto-receipt (described below) will be definitive of the time of receipt. Bids received after the deadline will not be accepted. Bidders are advised that the County cannot receive email attachments greater in size than twenty-five (25) megabytes and this size limitation may be further reduced by requirements of the Bidder's email provider which are beyond the control of the County. Bidder should consider separating any large bid attachment into multiple parts and emailing each part separately. In such case, Bidder will note that each email is *1 of 2, 2 of 2*, etc. Multiple part bids will not be considered unless all parts are received by the bid closing date and time.

After submitting a Bid to dpwbid@baltimorecountymd.gov, and upon successful receipt by the County thereof, Bidder will receive an auto-receipt email. This receipt is proof that the bid has been received by the Division of Construction Contracts Administration and should be retained for Bidder's records. In the case of a bid submitted in multiple parts as described above, an auto-receipt email will be generated for each part. The County has no obligation to consider any Bid for which an auto-receipt was not generated.

As with any system, power outages or technology problems may arise that are outside of the County's control and could affect your submission. The County will not be held accountable for such issues that may delay the transmission of any Bid.

NOTE: Electronic copy of the Bid Bond will be accepted at bid opening. The apparent low bidder is required to submit the original Bid Bond within ten (10) days after the bid opening to the Division of Construction Contracts Administration, 111 West Chesapeake Avenue, Room 300B, Towson, Maryland 21204.

INSTRUCTIONS AND SPECIFICATIONS

Refer to the enclosed proposal sheets for quantities to be bid upon. All proposals submitted on the attached form must give the price in clear figures for each item of the proposed work and be signed by the bidder with his name and address. Bidders must not change any item in the proposal for which a price has been stipulated by the County. Any change will cause rejection of the proposal.

NOTE: STATEMENT UNDER OATH FORM TO ACCOMPANY BID as per Baltimore County Purchasing Act 65-98, Section 15-94 and 15-95 which requires that the enclosed affidavit (see Proposal Affidavit pages in Section IV) be completed and submitted as part of the sealed bid.

Proposals made on any other than the attached form will not be considered. All papers included in, bound thereto, or attached to the Proposal Form are necessary parts thereof and shall not be detached, separated, or altered in their intent.

Changes in the phraseology of the proposal, additions, or limiting provisions will render the proposal informal or void and may cause its rejection.

All right is hereby reserved by the Purchasing Agent to reject any or all proposals and to waive formalities and technicalities as the interest of the County may require.

No successful bidder may withdraw his bid within NINETY (90) days after the opening thereof.

The successful bidder will be required to be bonded to Baltimore County, Maryland to the sum of One Hundred per Cent (100%) of the amount of his proposal or proposals according to the form of bond hereto attached for projects in excess of \$25,000.00.

This Proposal must be accompanied by a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment of the amount thus determined in case of a default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award. The Bid Bond must be in the form accompanying the Proposal executed by a Surety licensed in the State of Maryland. The Surety must be currently rated "B" or better by the A. M. Best Company, and the bid must be in an amount less than, or equal to, the underwriting limitation contained in Department of Treasury Circular 570 as amended at the time of the underwriting.

All work to be performed under this contract shall be done under strict compliance with Baltimore County Department of Public Works and Transportation September 2023 Standard Specifications for Construction and Materials and Standard Details for Construction and any and all proposed revisions thereto as of the date of advertisement and copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards, and all of which are made a part hereof and incorporated herein (collectively, the "Specifications").

If the bidder to whom an award is made shall fail to execute the contract and bond hereto attached and as herein provided, the award may be annulled and the contract awarded to the lowest responsible bidder who has consented to a time extension, and such bidder shall fulfill every stipulation embraced herein as if he were the original party to whom the award was made, or the Purchasing Agent may reject all of the bids as the interest of the County may require.

The Bid Bond of the three lowest bidders is deemed to be effective until the execution and delivery of the Contract Agreement, together with Payment and Performance Bonds for projects in excess of \$25,000.00 or until rejection of all bids, whereupon Surety is deemed relieved of all further obligations under the bid bonds provided.

Bidders must examine the drawings and specifications carefully and must make a personal examination of the location and nature of the proposed work. In case doubt shall arise as to the meaning or intent of anything shown on the drawings or comprised in the specification, inquiry shall be made of the Director of Public Works and Transportation at least five (5) days prior to the date of

bid opening. The submission of the Proposal shall indicate that the bidder thoroughly understands the drawings and the terms of the Specifications.

To better ensure fair competition and to permit a determination of the lowest bidder, unresponsive bids or bids obviously unbalanced may be rejected by the Purchasing Agent.

Bidders are required to fill out the total price column and total their proposals so that the result of the bidding, barring possible arithmetical errors, will be known at once. Any errors in computations will be corrected by the Engineer when the proposals are canvassed. Where the unit price and the total price are at variance, the unit price will prevail.

Bidders must be prepared to complete the work within the time stated in the proposal.

NOTE: ONLY CONTRACTORS FORMALLY PRE-QUALIFIED WITHIN THE ADVERTISED WORK CLASSIFICATION BY THE DIRECTOR OF PUBLIC WORKS AND TRANSPORTATION OF BALTIMORE COUNTY 10 CALENDAR DAYS PRIOR TO BID OPENING WILL BE ELIGIBLE TO SUBMIT BIDS.

Contracts for work under this proposal will obligate the contractors and subcontractors not to discriminate in employment practices. Bidders must, if requested, submit a compliance report concerning their employment practices and policies in order to maintain their eligibility to receive the award of the contract. Successful bidders must be prepared to comply in all respects with the Contract Provisions regarding nondiscrimination.

Baltimore County has adopted a Minority Business Enterprise (MBE) program and Women's Business Enterprise (WBE) Program. The percentage of participation applies to the contract amount awarded to the Contractor. Qualified minority subcontractors are those certified as being a Minority Business Enterprise by the following:

1. Maryland Department of Transportation Certification Committee (MDOT)
2. City of Baltimore, Minority Business Certification Council

Projects funded by the Federal Highway Administration are limited to the certification listed under #1 (MDOT).

More detailed information regarding the County's MBE/WBE Program can be obtained from the County MBE Office, telephone (410) 887-3407. See Executive Order dated December 6, 2022. MBE/WBE Participation Summary and Forms A, B, C, D and E enclosed in this proposal booklet.

NOTE: If you do not complete and submit the enclosed forms with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer **NON-RESPONSIVE** and accordingly the **COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.**

The County reserves the right to require the low bidder to produce evidence indicating that the company's financial condition is equal to, or better than, that enjoyed by the company at the time of prequalification. This additional information may be in the form of a financial statement or other evidence satisfactory to the Office of Budget and Finance.

Bidders' attention is directed to the requirement that a permit must be obtained from the Baltimore County Bureau of Highways and Bureau of Traffic Engineering prior to cutting any County

road for the purpose of obtaining sub-surface soils information, and permission must be obtained from the State Highways Administration prior to making any openings in a State road.

Under no circumstances shall a bidder enter upon any property outside a County or State road for the purpose of securing sub-surface soils information until permission is received from the property owner. The fact that the County has obtained a utility easement does not give the bidder the right to enter upon the property.

Prevailing index price of asphalt cement/ton \$640.00.

INCLEMENT WEATHER POLICY: If Baltimore County General Government Offices are open or open with liberal leave the day the bids are due, the bids are due as stated in the bid documents (date and time). **ONLY** when the Baltimore County General Government Offices are **OFFICIALLY CLOSED** the day the bids are due, the bid date will be postponed and an Addendum will be issued the next business (or next day buildings are officially open) day the county offices are open with the new bid date and time.

BID TABULATIONS: All bid tabulations will be confidential until after final award, at which time the total bid amounts for all bidders, as well as the complete bid tabulations for the top three (3) bidders, can be inspected by others when requested in writing pursuant to the Maryland Public Information Act.

ALTERNATIVE SOURCES OF CONTRACT BONDS: In the event your company is unable to qualify for bonding through a traditional commercial surety company, you may qualify for the required bonds through the State of Maryland, Department of Commerce (DOC). The **Maryland Small Business Development Financing Authority (MSBDFA, pronounced Mis-Bid-Fa)**, an agency of DOC, operates a Surety Bond Program designed to assist small businesses, based in Maryland, that are unable to obtain adequate bonding on reasonable terms in the commercial marketplace. MSBDFA provides bid, payment and performance bonds for contracts funded by government agencies, regulated utilities and private entities. The penal sums of the bonds are limited to the aggregate amount of \$2,500,000 and companies may pre-qualify for multiple bonds within pre-approved terms and conditions. MSBDFA also provides lines of credit, term loans and loan guarantees to help qualified businesses purchase equipment and real property, make improvements to leased property, refinance existing debt and assist them with their working capital needs. For more information on how to apply, you may contact: Meridian Management Group, Inc. (MMG), (the Program's Manager), 826 E. Baltimore Street, Baltimore, Maryland 21202, Telephone: (410) 333-4270. Or visit their website at www.mmcapitalgroup.com for information, applications and a checklist of required documents and reports that must accompany the application.

S E C T I O N I I

SPECIAL PROVISIONS

MAINTENANCE BOND

Per the Baltimore County Department of Public Works and Transportation September 2023 Standard Specifications for Construction and Materials, Section GP – 4.10 (C) states, the contractor is required to post a maintenance bond in the amount of five (5) percent of the total cost of the contract or withhold five (5) percent retainage for two (2) years from the date of Final Acceptance.

BALTIMORE COUNTY, MARYLAND

BOND NO. _____

CONTRACT NO. _____

MAINTENANCE BOND

THIS MAINTENANCE BOND is entered into on this _____ day of _____, 20____, by and between _____, as principal ("Principal") and _____, a business entity that is authorized to transact business in the State of Maryland and is organized and existing under the laws of the State of _____, as surety ("Surety"), are held and firmly bound unto Baltimore County, Maryland, a body corporate and politic of the State of Maryland ("County"), as Obligee.

WHEREAS, the above-named Principal has entered into a written contract known as Contract Number _____ dated _____, 20____ with Obligee for _____ (the "Agreement"), the terms of which are hereby incorporated by reference; and

WHEREAS, Principal has completed construction under the Agreement; and

WHEREAS, the Agreement includes a warranty on the quality of the Work performed that runs for a period of two (2) years from the date of the County's final acceptance and that runs for two (2) additional years beyond the repair date if any repair is done during the warranty period; and

WHEREAS, Principal is required to cause this instrument to be executed and delivered to Obligee as security for maintenance during the warranty period in an amount equal to 5% of the total value of the Contract.

NOW, THEREFORE, the Principal and Surety are held and firmly bound unto the Obligee in the sum of \$ _____ Dollars (\$ _____), lawful money of the United States of America, for the payment of which sum of money the Principal and Surety do bind themselves and their personal representatives, legal representatives, successors, and assigns, jointly and severally, firmly by this maintenance bond.

The conditions of this bond are as follows:

1. The Principal shall, for a period of two (2) years from and after the date of completion and acceptance of same by Obligee, replace all defects arising in the Work, whether resulting from defective materials, equipment, design furnished or workmanship. After such period, this obligation shall be null and void; otherwise it shall remain in full force and effect.

2. In the event of a default on the part of the Principal that may be the subject of a claim under this bond, Obligees shall mail, by certified mail, to Surety at the address listed below, a written statement that a claim is being made under the bond and, with substantial accuracy, the amount of the claim. Surety shall have no obligation to Obligees under this bond until the notice of claim is mailed.
3. When the Obligees has satisfied the condition of Paragraph 2 that a notice of claim be mailed, the Surety shall promptly and at the Surety's expense send an answer to Obligees within 30 days after the date of the claim. The answer shall state the amounts that are undisputed and the basis for challenging any amounts that are disputed. The answer shall be accompanied by payment (or arrangements for immediate payment) of any undisputed amounts.
4. Surety expressly waives any right to receive notice of extensions of time or alterations or modifications to the Agreement that may be granted by Obligees and agreed upon by Principal, and any such extensions, alterations, or modifications shall not affect the obligation of the Surety under this bond.
5. This bond is a specialty governed by the twelve-year statute of limitations period set forth in the Annotated Code of Maryland Courts and Judicial Proceedings §5-102.

WITNESS OR ATTEST:

(Principal – Contractor Name)

By: _____

Type Name: _____

Type Title: _____

Date: _____

(Surety)

By: _____

Type Name: _____

Type Title: _____

Type Address: _____

Date: _____

The Contract shall be done in strict compliance with the Baltimore County Department of Public Works and Transportation September 2023 "Standard Specifications for Construction and Materials" and "Standard Details for Construction", and any and all revisions thereto as of the date of the fully executed Contract, including but not limited to the General Conditions Building Projects, as applicable, and all of which are made a part hereof and incorporated herein (collectively, the "**Specifications**"). Copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards. **IN ADDITION, THE CONTRACTOR UNDERSTANDS AND AGREES THAT THE FOLLOWING SECTIONS OF THE SPECIFICATIONS (GP-1.03 AND GP-5-15) SHALL BE STRICKEN AND THE FOLLOWING SHALL BE INSERTED IN AND INCORPORATED INTO THE CONTRACT IN LIEU THEREOF:**

GP-1.03 ORGANIZATIONAL DEFINITIONS

Administration - Baltimore County.

Administrator - The Director of the Office of Budget and Finance, Baltimore County.

Baltimore County - Baltimore County, Maryland: a body corporate and politic.

Department - The word "Department" shall mean the Office of Budget and Finance of Baltimore County.

Engineer - One of the following engineering executives:

Director of Office of Budget and Finance
Chief, Property Management Division of the Office of Budget and Finance

Any delegation of the Engineer's authority must be authorized in writing by any one of the above listed officials, and such delegation of authority will pertain only to the specific contract and/or contracts shown by the authorization. The title of the specific official will appear in those cases within these specifications where the word "Engineer" as defined herein is not sufficiently specific.

Inspector - The authorized representative of the procurement officer assigned to make detailed inspection of any or all portions of the work, or materials therefor.

Procurement Officer - See Engineer.

GP-5.15 DISPUTES

(a) Except as otherwise may be provided by applicable law or regulation, all disputes arising under or as a result of a breach of this Contract that are not disposed of by mutual agreement shall be resolved in accordance with this General Provision.

(b) As used herein, "claim" means a: written demand or assertion by one of the parties seeking, as a legal right, the payment of money, adjustment or interpretation of Contract terms, or other relief, arising under or relating to this Contract.

A voucher, invoice, or request for payment that is not in dispute when submitted is not a claim under this General Provision. However, if the submission subsequently is not acted upon in a reasonable time, or is disputed either as to liability or amount, it may be converted to a claim for the purpose of this General Provision.

- (c) When a claim cannot be resolved by mutual agreement, the Contractor shall submit a written request for decision to the Department's Chief of the Property Management Division for his decision in consultation with the County Office of Law. The Contractor's written request shall set forth all the facts surrounding the controversy, including, but not limited to, those items listed in GP-5.14(b). Any claim by the County shall be decided in like manner.
- (d) The Contractor, at the discretion of the Engineer, may be afforded an opportunity to be heard and to offer evidence in support of his claim. Pending resolution of a claim, the Contractor shall proceed diligently with the performance of the Contract.
- (e) The Department's Chief of the Property Management Division shall decide any and all claims. The decision by the Department's Chief of the Property Management Division shall be issued within ninety (90) Days on matters of less than fifty thousand dollars (\$50,000) and within one hundred eighty (180) Days on matters of fifty thousand dollars (\$50,000) or more. The written decision of the Department's Chief of the Property Management Division shall be final and binding unless appealed in writing to the Director of the Department within thirty (30) Days of the Chiefs written opinion to the parties. If the Chiefs decision is timely appealed in writing to the Director of the Department, the Director of the Department, serving as referee, will review the written appeal submitted to assure all reasonable attempts were made to resolve the appeal.
- (f) The Director shall issue his/her decision in writing within ninety (90) Days. The Director's decision shall be final and conclusive unless a written appeal is mailed or otherwise filed with the County Administrative Officer within thirty (30) Days of the Director's written decision.
- (g) When the County Administrative Officer is satisfied all efforts at the Department level were made to resolve the dispute, a claim shall be resolved as follows:

 - (1) Subject to, and without in any way enlarging or limiting the other provisions of the Contract, the parties to any Agreement which adopts or incorporates by reference these Standard Specifications, appoint the County Administrative Officer as an administrative hearing officer pursuant to Article 25A, "Chartered Counties of Maryland", of the Annotated Code of Maryland.
 - (2) The parties further grant the County Administrative Officer the right to delegate this responsibility and authority in writing to a County official who is a registered professional engineer, independent of the Department of Public Works and Transportation's Division of Construction Contracts Administration, or to any other County official.
 - (3) For disputes involving ten thousand dollars (\$10,000) or more the decision of the administrative hearing officer shall be final and binding on both parties, subject only to such appeals on the record as provided by Article 25A. For disputes involving less than ten thousand dollars (\$10,000), the decision of the administrative hearing officer shall be final and binding on both parties.

GENERAL CONDITIONS

BUILDING PROJECTS



**Revised September 1, 2024,
in compliance with September 2023
Standard Specifications for Construction and Materials**

**INDEX GENERAL CONDITIONS
BUILDING PROJECTS**

	Page
I. <u>SPECIFICATIONS</u>	
Article 1 - Applicable Specifications	GC-1
II. <u>DEFINITIONS</u>	
Article 2 - Definitions	GC-1
Article 3 - Time Limits	GC-2
Article 4 - Sunday, Night & Holiday Work	GC-2
III. <u>CONTRACT DOCUMENTS & SHOP DRAWINGS</u>	
Article 5 - Contract Documents	GC-2 & 3
Article 6 - Shop Drawings	GC-4 & 5
Article 7 - Separate Contracts	GC-5 & 6
IV. <u>PAYMENT</u>	
Article 8 - Payments	GC-6
Article 9 - Approval of Payments	GC-6
Article 10 - Payment Withheld	GC-7
Article 11 - Changes in Work	GC-7 & 8
Article 12 - Claims for Extra Cost	GC-9
Article 13 - Deduction for Uncorrected Work	GC-9
Article 14 - Delays and Extension of Time	GC-9
Article 15 - Correction of Work after Final Payment	GC-9
Article 16 - Deleted	GC-9
Article 17 - Assignment	GC-9
Article 18 - Maryland State Sales Tax	GC-9 & 10
V. <u>MATERIALS</u>	
Article 19 - Materials	GC-10 & 11
VI. <u>QUALIFICATION, EMPLOYEES, WORKMANSHIP, SUBCONTRACTORS & ADVERTISING</u>	
Article 20 - Qualification of Bidders	GC-12
Article 21 - Employees and Workmanship	GC-12, 13 & 14
Article 22 - Employment Lists	GC-14
Article 23 - Contractor's Supervision	GC-14
Article 24 - The County's Right to Do Work	GC-14
Article 25 - County's Right to Terminate Contract	GC-15
Article 26 - Sanitary Conveniences	GC-16
Article 28 - Relation of Contractor and Subcontractor	GC-16, 17 & 18
Article 29 - Interlocking Contracts	GC-18
Article 30 - Advertising Signs	GC-18

VII. LAWS, PERMITS, LICENSES, INSURANCE & BONDS

Article 31 - Laws, Permits and Regulations	GC-18 & 19
Article 32 - Compensation, Liability and Property Damage Insurance	GC-19
Article 33 - Builder's Risk Insurance	GC-19 & 20
Article 34 - Guaranty Bonds	GC-20
Article 35 - Damages	GC-20

VIII. INSPECTION AND SURVEYS

Article 36 - Inspection	GC-20 & 21
Article 37 - Surveys	GC-21
Article 38 - Unauthorized Work	GC-21

IX. CONSTRUCTION

Article 39 - Construction Schedule	GC-21
Article 40 - Protection of Work and Property	GC-22
Article 41 - Shoring, Bracing and Sheeting	GC-22
Article 42 - Tests	GC-22 & 23
Article 43 - Cleaning Up	GC-23
Article 44 - As-Built Drawings	GC-23
Article 45 - Drainage and Pumping	GC-23
Article 46 - Temporary Water, Electric and Other Services	GC-23 & 24
Article 47 - Connecting to Existing Utilities	GC-24
Article 48 - Existing Utilities Shown on Plans	GC-24

X. MISCELLANEOUS ADDENDA

Article 49 - Holidays	GC-25
Article 50 - Buy American Steel	GC-25
Article 51 - Guarantee	GC-25
Article 52 - Offices and Telephones	GC-25 & 26
Project Sign	GC-27

GENERAL CONDITIONS DESIGN BUILD BUILDING PROJECTS

I. SPECIFICATIONS

Article 1 Applicable Specifications

All work performed under this Contract shall be done under strict compliance with the *Specifications* bound herewith, and with the *Baltimore County Standard Specifications for Construction and Materials* and the *Standard Details for Construction* dated September 2023 and subsequent addenda thereto, so far as the same may be applicable, copies of which are available on the County's website at www.baltimorecountymd.gov/departments/public-works/standards. These General Conditions are in addition to the aforementioned Specifications. Should there be any conflict with the aforementioned manuals, the *General Conditions* take preference.

II. DEFINITIONS

Article 2 Definitions

- A. *Architect and/or Engineer* shall mean the registered Architect and/or Engineer commissioned by the County to prepare the plans and contract documents.
- B. *Engineer* in these General Conditions and in the Construction Specifications in some instances refers to authorized representatives of the Office of Budget and Finance, Property Management.
- C. *Subcontractor*, as employed herein, includes only those having a direct contract with the Contractor. It includes one who furnished material worked to a special design according to the Plans and Specifications for the "work." It excludes one who merely furnished material not so worked.
- D. *Written Notice* shall be deemed to have been duly served if delivered in person to the individual or to a member of the firm or to an officer of the corporation for whom it is intended, or if delivered to or sent by registered mail to the last business address known to him who gives the notice.
- E. *Repair* means to restore after injury, deterioration, or wear; to mend, to renovate, by such means as appropriate, and to supply such materials and labor as necessary to render the item to be repaired sound, solid, true, plumb, square, even, smooth, and fully serviceable. Upon completion of such repair it must be, unless otherwise stated, rendered to such condition as to present a first-class finished work, or in instances where the repaired item serves as a base for additional finish, the repaired work must be such as to permit a first-class finish, to be applied without extra cost to the County. When the word "repair" is used in connection with machinery or mechanical equipment, it shall mean, in addition to the above, rendering the equipment completely serviceable and efficient, ready for the normal use for which it was originally intended.

- F. Some parts of the "Construction Specifications," bound herewith are of the abbreviated or "streamlined" type and includes incomplete sentences. Omissions of words or phrases such as "the Contractor shall", "in conformity therewith", "shall be", "as noted on the drawings", "according to the plans", "a", "an", "the", and "all" are intentional. Omitted words or phrases shall be supplied by inference in the same manner as they are when a "note" occurs on the drawings. Words "shall be" or "shall" will be supplied by inference when colon (:) is used within sentences or phrases.

Article 3 Time Limits

The proposal shall indicate whether the contract limit is based on Working Days or Calendar Days. If this is not indicated in the Proposal, then the time limits will be based on Calendar Days.

Article 4 Sunday, Night and Holiday Work

If Sunday, night or holiday work is necessary due to an emergency or is permitted by the Engineer, the Contractor shall secure and pay for any and all permits required in connection with this work.

III. CONTRACT DOCUMENTS AND SHOP DRAWINGS

Article 5 Contract Documents

A. Clarification

It is assumed that the Contractor has obtained clarification of all questions which may have arisen as to intent of the contract documents, or assumed, or actual conflict between two or more items in the Contract Documents as required in "Instructions to Bidders." Should the Contractor have failed to obtain such clarification as required by the "Instructions to Bidders," then the Engineer may direct the work to proceed by any method indicated, specified or required by the Contract Documents in the interest of maintaining the best construction practice. Such direction by the Engineer shall not constitute a claim for extra by the Contractor.

B. Jargon

Work described in words that have a well-known technical or trade meaning shall be held to refer to such recognized standard use.

C. Drawings

The Contractor shall do no work without proper drawings and instructions. Drawings are, in general, drawn to scale; however, symbols are used to indicate materials and structural and mechanical requirements. When symbols are used, the drawings are, of necessity, diagrammatic, as it is not possible to indicate all connections, fittings, fastenings, etc., which are included as a part of the work. Diagrammatic indication of mechanical piping, ducts, and conduit within the buildings is subject to adjustment in order to obtain proper grading, passage over, under or past obstructions, to avoid exposure in finished rooms and unsightly and obstructing conditions. The Contractor shall coordinate these adjustments.

1. Copies no longer Furnished

The County will no longer furnish the Contractor any copies of the Drawings and Specifications. Additional copies may be obtained by the Contractor downloading drawings and specifications from the Baltimore County Solicitation Web Page.

2. Copies of the Work

The Contractor shall keep in the office on the job a complete set of all drawings, specifications, shop drawings, schedules, etc., in good order and available to the Engineer and representatives of the County.

3. Ownership

All documents as furnished by the County remain the property of the County. They must not be used on other work but shall be returned to the County upon completion of the work.

D. Large Scale Detail Drawings

The Architect shall furnish, when necessary, additional instructions in the form of large scale developments of the drawings used for bidding, or to amplify Construction Specifications for the proper execution of the work. These shall be true developments of the bidding documents and reasonably inferable there from. The work shall be executed in conformity herewith. [See Article 6, Paragraph A.3.(c)]

E. Dimensions

The Contractor shall carefully check all dimensions prior to execution of the particular work affected. Whenever inaccuracies or discrepancies are found, the Contractor shall consult the Engineer prior to any construction or demolition. Should any dimensions be missing, the Engineer will be consulted and supply them prior to execution of the work. Dimensions for items to be fitted into constructed conditions at the job will be taken at the job and will be the responsibility of the Contractor. The obvious intent of the documents or obvious requirements dictated by conditions existing or being constructed supersedes dimensions or notes which may be in conflict herewith.

Whenever a stock size manufactured item or piece of equipment is specified by its nominal size, it is the responsibility of the Contractor to determine the actual space requirements for setting or entrance to the setting space. No extra will be allowed by reason of work requiring adjustment in order to accommodate the particular item of equipment.

Whenever new work, building, addition or portions thereof are not accurately located by plan dimensions, the Engineer will supply exact position prior to execution of the work.

Article 6 Shop Drawings

A. Shop Drawings (those prepared by the Contractor or Vendor of Material)

The Contractor shall submit for the Architect's approval, at such times as agreed (see Article 8), shop drawings (to include setting drawings and schedules) as required for the work of the various trades. These drawings shall be prepared in conformity with the best practice and standards for the trade concerned. Due regard shall be given to speed and economy of fabrication and erection.

1. Items to be Detailed

Shop details shall be supplied for all items which are specially fabricated for the work or when the assembly of several items is required of a working unit. Shop drawings are required for all reinforcing and structural steel, specially made or cut masonry units, miscellaneous metal work, specially made flashings or roofing and sheet metal work, specially made millwork, special rough hardware and all heating, ventilating, plumbing and electrical requiring special fabrication or detailed connections, including ducts.

2. Submissions

Shop drawings, brochures and catalog cut submissions shall consist of sufficient copies to provide for the retention by the Architect and County of five (5) copies total plus such additional copies as the Contractor may require. Drawings shall not exceed 24 in. x 36 in. in size.

3. Examination and Approval

The Contractor shall review all shop drawings, brochures and catalog cuts provided by the subcontractors and vendors prior to submitting them to the Architect. The Architect shall examine shop drawings with reasonable promptness, noting desired corrections, or granting approval.

a. Field Dimensions and Conditions

The Architect is not responsible for the checking of dimensions or existing conditions in the field. This is the sole responsibility of the Contractor.

b. Resubmission

When the Architect's notations or corrections are extensive, then the Contractor shall resubmit the drawings with changes made on the drawings.

c. Contractor's Responsibility

Unless the Contractor has in writing, notified the Architect to the contrary, at the time of submission, it will be assumed that the drawings are in conformity with the Contract Documents and do not involve any change in the Contract price or any change which will alter the space within the structure or alter the manner of operation from that contemplated in the Contract Documents.

d. Architect's Notations

Should the Contractor consider any change or notation received in compliance with paragraph (c) above as increasing the cost of the work from that contemplated in the Contract Documents, then the Contractor shall desist from further action relative to the item he/she questions and shall notify the Engineer, in writing, within five (5) days of the additional cost involved. No work shall be executed until the entire matter is cleared or a Change Order issued, or the Contractor is ordered by the Engineer to proceed under the provisions of the County's Standard Specifications. Failure of the Contractor to serve written notice, as above required, shall constitute a waiver of any claim in relation thereto.

(1) Similarly, should the Architect's notation or change involve less work than is covered by the Contract Documents, the Contractor shall allow the County the credit resulting from the change.

(2) Should the Contractor consider that any notation or change made by the Architect under provisions of this paragraph, paragraph (c), above, as involving a complete change in the subcontractor's relation or the substitution of a material different from that on which the Contract was based, then the Contractor shall act as herein stated or as in paragraph (c) above.

4. Project Completion

At the completion of the project, the Contractor shall submit a list of shop drawings for the entire project. This list shall contain the following information: title, description, specialty (Architectural, Structural, Mechanical, etc.), decision (no exceptions taken, approved, approved as noted, etc.).

Article 7 Separate Contracts

A. The County reserves the right to let other contracts in connection with paving and utilities adjoining this work. The Contractor shall afford other contractors reasonable opportunity for the introduction and storage of their materials and the execution of their work, and shall properly connect and coordinate his work with theirs.

- B. If any part of the Contractor's work depends for proper execution or results upon the work of any other contractor, the Contractor shall inspect and promptly report to the Engineer any defects in such work that render it unsuitable for such proper execution and results. Failure to inspect and report shall constitute an acceptance of the other contractor's work as fit and proper for the reception of the work, except as to the defects which may develop in the other contractor's work after the execution of the work.
- C. To ensure the proper execution of his/her subsequent work, the Contractor shall verify work already in place and shall at once report to the Engineer any discrepancy between the executed work and the drawings.

IV. PAYMENTS

Article 8 Payments

- A. Under this Contract payments will be made monthly on the valuation of work accomplished and on account of materials delivered on the site, for incorporation in the work, which are suitably stored.
- B. At the first of each month, the Contractor shall submit to the Engineer an application for payment on a form provided by the Engineer. Prior to application for first payment, the Contractor shall submit to the Engineer a schedule of values for the various parts of the work, including quantities, aggregating to the total sum of the Contract. This shall be so divided as to facilitate payment to subcontractors in accordance with Article 28, Paragraph C.1. The form of this submission shall be such as the Contractor or Engineer have agreed upon, and, if required, shall be supported by such evidence as to its correctness as the engineer may direct. This schedule, when approved by the Engineer, shall be used as a basis for approval of payment unless it is found to be in error. In applying for payment, the Contractor shall submit a statement based upon the schedule, itemized in such form and supported by such evidence as the Engineer may require, showing the Contractor's right to the payment claimed. If required, the Contractor shall show receipts and other vouchers for the payments for materials and labor including payments to subcontractors, as required by Article 28.
- C. Materials Purchased Under Allowance

The Engineer will provide schedules for all materials to be purchased from specified allowance.

Article 9 Approval of Payments

If the Contractor has made application, as above, the Engineer shall review and approve such payments as is decided to be properly due in accordance with the approved schedule. In approving such partial payments, there shall be retained no more than 10% of the total amount for the first 50% of the contract, after which only 5% of the total amount of the contract may be withheld unless the need is demonstrated for retaining more to protect the public interest.

Article 10 Payment Withheld

- A. The Engineer may withhold, or on account of subsequently discovered evidence, nullify the whole or a part of any payment to such extent as may be necessary to protect the County from loss on account of:
1. Defective work not remedied.
 2. Claims filed, or reasonable evidence indicating probable filing of claims, by parties other than the Contractor.
 3. Failure of the Contractor to make payments properly to subcontractors or for material or labor.
 4. A reasonable doubt that the Contract can be completed for the balance then unpaid.
 5. Damage to another Contractor.
 6. Failure of the Contractor to submit data required within the time limits stated in the Contract Documents.

Upon removal of the above, payment shall be made for the amounts withheld.

Article 11 Changes in Work

- A. The County, without invalidating the Contract, may order changes in the work by altering, adding to or deduction from the work, the Contract sum being adjusted accordingly. Such change shall be executed under these *General Conditions*. Extension of time made necessary thereby shall be adjusted at the time of such Change Order.
- B. The Engineer shall have authority to make minor changes in the work not involving extra cost and not inconsistent with the purpose of the project. Otherwise, except in an emergency endangering life or property, no extra work or change shall be made unless a written order for the Office Budget and Finance, Property Management signed or countersigned by the Director has been received by the Contractor. No claim for addition to the Contract sum shall be valid unless so ordered.
- C. The value of any such extra work or change shall be determined in one or more of the following ways as determined by the Office of Budget and Finance, Property Management.
1. By Estimate and Acceptance of a Lump Sum
 - a. The prime Contractor shall furnish a breakdown of the estimated construction cost. The breakdown shall be of sufficient detail to describe the extra work and related costs for labor, material, overhead and profit.

b. Overhead and Profit

(1) Extra work by Subcontractor:

Subcontractor will be allowed 10% overhead and 10% profit added to the direct labor and material costs. The prime contractor will be allowed to increase the subcontractors total lump sum by 10% to cover his/her administration.

(2) Extra work by Prime Contractor:

The prime contractor will be allowed 10% overhead and 10% profit added to the labor and material costs.

- c. The prime contractor will be allowed 1 % for the bond added to the labor and material costs.
- d. The allowed overhead will include all supervision; no additional allowance will be made for it.

2. By Unit Prices Named in the Contract or Subsequently Agreed Upon

Such unit prices are to include all supervision, overhead, taxes, insurance and profit.

3. By Cost and a Fixed Fee

Added to the cost is a fixed fee portion which is to include supervision, overhead, insurance and profit.

4. By Force Account (Labor and Material Cost plus)

In accordance with the *Baltimore County Specifications for Construction and Materials* Section GP 9.02, the Contractor is allowed to add 65% mark-up.

- D. Should none of the methods stated in Paragraph C. 1, 2, or 3 be determined, the Contractor shall, providing he/she receives an order as defined in Paragraph B, above, proceed with the work on the basis of Paragraph C. 4. Force Account.

The Contractor and Engineer shall keep accurate costs, in such form as the Engineer may direct, for presentation, together with vouchers, to the Office of Budget and Finance Property Management for determination of the value of the work included in each Change Order. Pending determination of the final value, the Engineer may include payments for materials and labor, as stated in Article 8, in monthly vouchers.

Article 12 Claims for Extra Cost

No claim for extra will be granted which includes cost of delays or work stoppage due to strikes, lockouts, fire, avoidable casualties or damage or delay in transportation for which the County or its agents are not responsible. (See also Article 14.)

Article 13 Deductions for Uncorrected Work

If the Engineer and County deem it expedient to correct work injured or done not in accordance with the Contract, an equitable deduction from the Contract price shall be made therefore.

Article 14 Delays and Extension of Time

If no schedule or agreement stating the dates upon which drawings shall be furnished is made (see Article 8), then no claim for delay shall be allowed on account of failure to furnish drawings until two (2) weeks after demand for such drawings, and then not unless such claim is reasonable.

Article 15 Correction of Work After Final Payment

Neither the final certificate nor payment nor any provision in the Contract Documents shall relieve the Contractor of responsibility for faulty materials and workmanship. Unless otherwise specified, the Contractor shall remedy any defects and pay for any damage to other work resulting there from that appears within the guarantee period. The County shall give notice of observed defects with reasonable promptness. All questions arising under this Article shall be decided by the Director of Budget and Finance, Property Management.

Article 16 (Deleted)

Article 17 Assignment

The Contractor shall not assign the Contract. It shall not be sublet as a whole or sublet by trades or other portions in an amount of more than 75% of the monetary value of the Contract. The remaining 25% shall be executed by the Contractor with labor and materials directly purchased and paid for by the Contractor. Costs for insurance, over-head, supervisions, etc., may not be claimed as a portion of the 25% mentioned above. The execution of work by a subsidiary of the Contractor is not considered direct employment. The Contractor shall not assign any monies due or to become due to him/her hereunder, without the previous written consent of the County.

Article 18 Maryland State Sales Tax

- A. Contractors who are performing work for the State of Maryland or any of its political subdivisions are required to pay tax on materials and supplies which will be incorporated into the work.

- B. The Contractor must pay the tax on all equipment which is purchased, Even though it may be used on a job for the State of any of its political subdivisions.

V. MATERIALS

Article 19 Materials

Materials include all manufactured products and processed and unprocessed natural substances required for completion of the Contract. The Contractor in accepting the Contract is assumed to be thoroughly familiar with the materials required and their limitations as to use and requirements for connections, setting, maintenance and operation.

Whenever an article, material or equipment is specified and a fastening, furring, connection (including utility connections), bed or accessory is normally considered essential to its installation in good quality construction, such shall be included as if fully specified. Nothing in the Construction Specifications shall be interpreted as authorizing any work in any manner contrary to applicable law, codes or regulations (See Article 31).

A. Approval

All materials are subject to the Architect's or Engineer's approval as to conformity with the specifications, quality, design, color, etc. No work for which approval is necessary shall be contracted for, or used, until written approval is given by the Architect or Engineer. Approval of a subcontractor, as such, does not constitute approval of a material which is other than that included in the Construction Specifications.

B. New Materials

Unless otherwise specified, all materials shall be new.

C. Quality

Unless otherwise specified, all material shall be of the best quality of the respective kinds.

D. Samples

The Contractor shall furnish for approval all samples as directed. The work shall be the same as the approved samples.

E. Painting and Color

The Architect and Contractor shall jointly prepare the paint and color schedules. The Architect shall direct the exact color, texture and finish.

F. Proof of Quality

The Contractor shall, if required, furnish satisfactory evidence as to the kind and quality of materials either before or after installation. The Contractor shall pay for any tests as may be deemed necessary in relation to "Substitutions" (Paragraph I. below).

G. Contractor's Option

When several products or manufacturers are named in the Construction Specifications for the same purpose or use, then the Contractor shall select any of those so named. However, all of the units of a thing required for a project must be the same in material and manufacture.

H. "Or Equal", "Equal", "Approved Equal"

The above terms are used as synonyms throughout the Construction Specifications. They are implied in reference to all named manufacturers. Only materials that, in the opinion of the Engineer, are fully equal in all details of construction, methods of assembly, finish and design quality will be considered. (See A, C, E, above, and I. below.)

I. Substitutions

Should the Contractor desire to substitute another material for one or more specified by name, the Contractor shall apply, in writing, for such permission and state the credit or extra involved by the use of such material. The Engineer will not consider the substitution of any material different in type or construction methods unless such substitution effects a benefit to the County. (See A. and D. above.)

The Contractor shall not submit for approval, materials other than those specified without a written statement why such a Substitution is proposed. Approval of a "substitute" material by the Architect or Engineer when the Contractor has not designated such material is a "substitute," shall not be binding on the County nor release the Contractor from any obligations of the Contract, unless the Architect or Engineer approves such "substitutions" in writing.

J. Standard Specifications

Whenever references are made in the Contract Documents to the *Baltimore County Standard Specifications for Construction and Materials* and *Standard Details for Construction*, it shall be understood that the latest standards and/or requirements are intended and shall apply. When no specification is cited and the quality, processing, composition or method of installation of a thing is only generally referred to then:

1. For things not otherwise specified below, the latest edition of the Applicable American Society for Testing Materials Specifications shall apply.

2. For things covered by the applicable portions, the National Bureau of Fire Underwriters Code shall apply.
3. For things generally considered as plumbing and those things requiring plumbing connections, the applicable portions of the latest edition of the American Society of Mechanical Engineers Code and the Baltimore County Plumbing Code shall apply.
4. For things generally considered as heating and ventilating work and not covered by A.S.M.E. Code, the applicable portions of the latest edition of the Heating and Ventilating Guide, published by the American Society of Heating and Ventilating Engineers, and the Baltimore County Building Code shall apply.

K. Storage

The contractor shall confine apparatus and storage of materials to the "off-road" area delineated as the "Limit of Contract." The Contractor shall not load or permit any part of the structure to be loaded with a weight that will endanger the safety of the structure or any part thereof.

VI. QUALIFICATION, EMPLOYEES, WORKMANSHIP, SUBCONTRACTORS AND ADVERTISING

Article 20 Qualification of Bidders

Bidders are required to be prequalified 10 days prior to bid opening, satisfactorily evidencing that they have the ability, equipment, organization and financial resources sufficient to enable completion of the work satisfactorily within the time specified in the Proposal.

Article 21 Employees and Workmanship

A. Employees

1. Qualification

Only personnel thoroughly trained and skilled in the task assigned them may be employed on any portion of the work, or they shall be removed.

2. Licensed

When County, State or Federal laws require that certain personnel (electricians, plumbers, etc.) be licensed, then all such personnel employed on the work shall be so licensed.

B. Quality of Labor

The Contractor shall employ on the work, at all times, sufficient personnel to complete the work within the time stated in the Proposal.

C. Work Areas

The Contractor shall confine the operations of his/her employees to the limits as provided by law, ordinance, permits or directions of the Office of Budget and Finance Property Management. Generally, the "off-road" area will be the same as the "limit of Contract" line.

D. Methods and Quality

1. All workmanship shall be of good quality. Whenever the method of the work or manner of procedure is not specifically stated or shown in the Contract Documents, then it is intended that the best standard practice shall be adhered to. Recommendations of the manufacturers of approved materials shall be considered as a part of Construction Specifications and all materials shall be applied, installed, connected, erected, used, cleaned and conditioned as so called for thereby. This, however, does not remove any requirement in Construction Specifications to add to the manufacturer's recommendations.
2. All materials shall be accurately assembled, set, etc., and when so required in good construction, shall be true to line, even, square, plumb, level and regularly spaced, coursed, etc. Under no circumstances, either in new or old work, shall any material be applied over another which has not been thoroughly cleaned, sanded or otherwise treated so as not to impair the finish, adhesion, or efficiency of the next applied item.
3. All methods, procedures and results are subject to the Engineer's approval as to finished result to be obtained. However, this is not to be interpreted as placing upon the Engineer any responsibility for the "work" management which is solely the responsibility of the Contractor.

E. Joining of Work

1. The Contractor shall so schedule the work as to ensure efficient and uninterrupted progress and to hold to an absolute minimum the cutting and patching of new work. All cutting, patching and digging necessary to the execution of the work is included.
2. The Contractor shall so schedule (to include subcontracts) the construction performed by each group or trade that each installation or portion of the construction shall member with and join with all other work as required for a complete installation, all according to accepted good construction practice.

F. Superintendent

The Contractor shall keep on the work, at all times during its progress, a competent superintendent and all necessary assistants, all approved by the

Office of Budget and Finance Property Management. Prior to commencement of the work, the Contractor shall submit in writing to the Office of Budget and Finance Property Management the name and qualifications of the person to be employed as Superintendent for the execution of the Contract. A written approval or rejection will be given following review of the data. Persons who have previously proved unsatisfactory on work executed for the County, or who are without proper qualifications, will not be approved. Should the Superintendent be complained of by the Office of Budget and Finance Property Management for cause, he/she shall be removed from the work. Should it be necessary to change the Superintendent, the above procedure shall be repeated. The Superintendent will represent the Contractor. All directions given to the Superintendent shall be as binding as if given to the Contractor. Important directions shall be confirmed on written request in each case.

G. Discipline

The Contractor shall at all times enforce strict discipline and good order among his/her employees and shall not employ or permit to remain on the work any unfit person. The Contractor shall enforce all instructions relative to use of water, heat, power, no smoking, and control any use of fires, as required by law and for the Office of Budget and Finance Property Management. Employees must not be allowed to loiter on the premises before or after job working hours.

Article 22 Employment Lists

The Contractor may contact MARYLAND STATE EMPLOYMENT SERVICE, Towson, MD, 21204, if so desired, for additional labor regarding this project.

Article 23 Contractor's Supervision (Also see Article 21, Paragraph F.)

The Contractor shall constantly maintain efficient supervision of the work, using his/her best skills and coordinating ability. The Contractor shall carefully study and compare all drawings, specifications, and other instructions and check them against conditions existing or being constructed on the project. The Contractor shall report to the Engineer any error inconsistency or omission which may be discovered. (See also Article 5, Paragraph E, and Instructions to Bidders.) The Contractor shall not be held responsible for the existence or discovery of such errors or conflicts and neither shall the adjustment of such errors or conflicts be grounds for claim for extra on the art of the Contractor unless such adjustment involves work not obviously contemplated by the Contract Documents or necessary to progress of the work. The Contractor shall be responsible for the coordination of the work of all subcontractors.

Article 24 The County's Right to do Work

If the Contractor should neglect to prosecute the work properly or fail to perform any provision of this Contract, the County after three days' written notice to the Contractor may, without prejudice to any other remedy, make good such deficiencies and may deduct the cost thereof from the payment then or thereafter due the Contractor.

Article 25 County's Right to Terminate Contract

A. Terminate Contract

The Office of Budget and Finance, Property Management, upon proof that sufficient cause exists to satisfy such action, may without prejudice to any other right or remedy, and after giving the Contractor seven (7) days' written notice, terminate the employment of the Contractor and take possession of the premises and of all materials, tools, and appliances thereon and finish the work by whatever method may be deemed expedient, if any of the following conditions exists:

1. If the contractor should
 - a. Be adjudged a bankrupt or make a general assignment for the benefit of creditors,
 - b. Has a receiver appointed on account of insolvency.
 - c. Fails to or repeatedly and persistently refuses to supply properly skilled workers or proper materials, except in cases for which extension of time is provided,
 - d. Fails to make payment to subcontractors, or for materials and labor,
 - e. Persistently disregards laws, ordinances or the instructions of the Engineer, or
 - f. Is otherwise guilty of a substantial violation of any provision of the Contract.

2. Payment Status

In cases such as identified above, the Contractor shall not be entitled to receive any further payment until the work is finished. If the unpaid balance of the Contract price shall exceed the expenses of finishing the work, including compensation for additional managerial and administrative services, such excess shall be paid to the Contractor. If such expense shall exceed such unpaid balance, the contractor shall pay the difference to the County. The expense incurred by the County as herein provided, and the damage incurred through the Contractor's default, shall be itemized by the Engineer and a certified copy supplied to the Contractor.

Article 26 Sanitary Conveniences

- A. The Contractor shall arrange for the erection and Maintenance of temporary toilets equipped with running water and drain connection for use of employees. These conveniences shall be erected and kept clean and in good condition, as required by law, until ordered removed by the Engineer.
- B. In lieu of A. above, the Contractor may install a portable approved chemical toilet at an approved location.
- C. The permanent plumbing fixtures to be constructed under this Contract shall not be used during construction, under any circumstances.

Article 27 Subcontracts Deleted

Article 28 Relation of Contractor and Subcontractor

- A. **The Contractor agrees** to bind every subcontractor and every subcontractor agrees to be bound by the terms of the Agreement, *Baltimore County's Standard Specifications for Construction and Materials* and *Standard Details for Construction the General Conditions*, the Drawings and Construction Specifications, as far as applicable, to his/her work, including the following provisions of this Article, unless specifically noted to the contrary in the subcontract approved in writing as adequate by the Office of Budget and Finance, Property Management.
- B. **The Subcontractor agrees** to be bound to the Contractor by the terms of the Agreement, *Baltimore County's Standard Specifications for Construction and Materials* and *Standard Details for Construction, General Conditions*, Special Provisions, Construction Specifications, and to assume towards him/her all obligations and responsibilities that he/she, by those documents, assumes towards the County.
 - 1. To submit to the Contractor applications for payment in such reasonable times as to enable the Contractor to apply for payment under Article 8 of these *General Conditions*.
 - 2. To make all claims for extras, for extensions of time and for damages for delays or otherwise, to the Contractor in the manner provided in *Baltimore County's Standard Specifications for Construction and Materials* or those *General Conditions* for like claims by the Contractor upon the County, except that the time for making claims for extra cost is one (1) week.

C. **The Contractor agrees** to be bound to the Subcontractor by all the obligations the County assumes to the Contractor under Agreement, *Baltimore County's Standard Specifications for Construction and Materials, General Conditions*, Drawings and Construction Specifications, and by all the provisions thereof affording remedies and redress to the Contractor from the County.

1. To pay the Subcontractors:

- a. Upon receipt of payment, if issued under the schedule of values described in *Baltimore County's Standard Specifications for Construction and Materials, G.P.- 9.03* or Article 8 of these *General Conditions*, the amount allowed to the Contractor on account of the Subcontractor's work, to the extent of the Subcontractor's interest herein.
 - b. Upon the receipt of payment, if issued otherwise than as in Paragraph C.1., above, so that at all times the total payments shall be as large in proportion to the value of the work done by him as the total amount certified to the Contractor is to the value of the work done by him/her.
 - c. To such extent as may be provided by the Contract Documents or the subcontract, if either of these provides for earlier or larger payments than the above.
 - d. On demand for his/her work or materials as far as executed and fixed in place, less the retained percentage, at the time the payment is requested, even though the Engineer fails to approve it for any cause not the fault of the Subcontractor.
 - e. A just share of any fire insurance money received by him/her, the Contractor, under Article 35 of these *General Conditions*.
2. To make no demand for liquidated damages or penalty for delay in any sum in excess of such amount as may be specified in the subcontract.
3. That no claim for services rendered or materials furnished by the Contractor to the Subcontractor shall be valid unless written notice thereof is given by the Contractor to the Subcontractor during the first ten (10) days of the calendar month following that in which the claim was originated.
4. To give the Subcontractor an opportunity to be present and to submit evidence in any manner involving his/her rights.

5. The Contractor and the Subcontractor agree that nothing in this Article shall create any obligation on the part of the County to pay to or to see to the payment of any sums to any Subcontractor.

Article 29 Interlocking Contracts

The attention of the Contractor and all Subcontractors is specifically called to the necessity of reading the Specifications covering items of the work which connect with or are dependent upon the work specified under each heading, and each Contractor executing the work called for there under shall be responsible for arranging for proper provision for connecting and coordinating his/her work with such other items.

Article 30 Advertising Signs

- A. The Contractor will furnish, erect and maintain a project sign for the duration of the project. The sign shall be placed on the site where and as directed by the Engineer. The sign shall be fastened to three posts spaced 4' apart. The posts shall be 4" x4", seven feet above ground and three feet below ground.
- B. The project sign is shown on page GC-27 in this book.

VII. LAWS, PERMITS, LICENSES, INSURANCE, AND BONDS

Article 31 Laws, Permits and Regulations

- A. Permit and Service Connections:
 1. **BUILDING PERMIT** - The County will obtain the building permit at no cost to the Contractor.
 2. **PERMANENT WATER SERVICE** - The County will apply for the water service and pay all related charges; i.e., water meter, water systems connection charge, water distribution charge and sewer systems connection charge. Total installation of the permanent water service is part of this Contract. Water service shall be installed by a County Prequalified Utility Contractor.
 3. **PLUMBING PERMIT** - The Contractor shall apply for the Permit; however, the County will pay all related charges and fees.
 4. **PERMANENT ELECTRIC SERVICE** - The Contractor shall apply for and pay for the electrical permit. The County shall obtain BGE permanent gas and electric service to the site at no cost to the Contractor.

The Contractor shall coordinate the installation of permanent gas and electric service with Baltimore Gas & Electric

Company. Both the gas and electric services shall be activated at the same time under one account number showing Baltimore County as owner. The Contractor shall be responsible for payment of consumption charges for the use of gas and electric energy obtained through the permanent service until the building is accepted by the County or until agreed upon by the County in direct coordination with the Building Services Division of Baltimore County. Charges from BGE for removal of existing electric service will be paid by the County.

5. **PERMANENT TELEPHONE SERVICE** - The County shall pay for the telephone service and systems to and in the building. The Contractor is responsible for supplying and installing all conduit, cables and junction boxes as shown on the drawings or called out in the Specifications.
 6. **CABLE** - The County shall pay for any cable television service into the building. The contractor is responsible for supplying and installing the remaining work as shown on the drawings and called out in the Specifications.
 7. **TEMPORARY SERVICES** -All temporary services, such as water, electric, telephone, etc., shall be the Contractor's entire responsibility. (Also see Article 46.)
 8. **MISCELLANEOUS PERMITS** - The Contractor shall procure any and all necessary permits not previously mentioned and pay any and all related charges and fees required and incidental to the due and lawful prosecution of the work.
- B. The Contractor shall give all notices and comply with all State and Federal laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If the Contractor observes that the Drawing and Contract Specifications are at variance therewith, he/she shall promptly notify the Engineer, in writing, and any necessary changes shall be adjusted as provided in the Contract for changes in the work. If the Contractor performs any work knowing it to be contrary to such laws, ordinances, rules and regulations, and without such notice to the Engineer, he/she shall bear all costs arising there from.

Article 32 Compensation, Liability, and Property Damage Insurance

(See Insurance Provision in Part VI of this Contract.)

Article 33 Builder's Risk Insurance

- A. The Contractor shall, at his/her own cost, insure the work and keep it insured at all times during the period of construction, and until final acceptance of it by the County, against loss or damage covered by

an "All Risk" Builders Risk type of policy. The amount of insurance shall be the 100% estimated replacement cost of the work.

- B. The policies shall be made payable to the County and the Contractor, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of construction.

Article 34 Guaranty Bonds

- A. Prior to signing of the Contract, the Contractor will be required to furnish bond covering the faithful performance of the Contract and the payment of all obligations arising there under, in such form as the County may prescribe with such sureties as the County may approve. The premiums shall be paid by the Contractor.
- B. The Bond to be in the amount of the total Contract price.
- C. At the direction of the Office of Budget and Finance, Property Management, the Contractor may be required to increase the above bond. Such addition will be paid for by the County in the amount of actual cost to the Contractor.

Article 35 Damages

- A. If either party to this Contract should suffer damages in any manner because of the wrongful act or neglect of the other party or of anyone employed by him/her, then reimbursement shall be made by the other party for such damage.
- B. Claims under this clause shall be made in writing to the party liable within a reasonable time at the first observance of such damage and not later than the time of final payment, except as expressly stipulated otherwise in the case of faulty work or materials, and shall be adjusted by agreement.
- C. Should the Contractor cause damage to any separate contractor on the work, the Contractor agrees, upon due notice, to settle with such contractor by agreement or refer the matter to the Office of Budget and Finance, Property Management, who will render a decision after hearing all evidence in the matter. The Contractor shall pay or satisfy such decision.

VIII. INSPECTION AND SURVEYS

Article 36 Inspection

- A. If the Construction Specifications, the Engineer's instructions, laws, ordinances, or any public authority require any work to be specially tested or approved, the Contractor shall give the Engineer timely notice of its readiness for inspection, and if the inspection is by another authority, the date fixed for such inspection. Inspections by

the Engineer shall be made promptly, and where practicable, at the source of supply. Any work covered without approval of the Engineer must, if required, be uncovered for examination at the Contractor's expense.

- B. If initial tests and/or inspections show substandard products, materials, workmanship, etc. and the Contractor elects, with the Engineer's approval, to perform additional tests and/or inspections to prove the acceptability of the substandard products, materials, workmanship etc., he/she shall perform same at his/her expense.

Article 37 Surveys

- A. The General Contractor shall, at his/her own expense, employ a registered surveyor to provide Elevation Bench Mark, and locate corners of the building and the limits of contract.
- B. The General Contractor shall, at his/her own expense, employ a competent field engineer, to give the lines and levels for the building, sidewalks and footings, etc. The Contractor will be responsible for all lines and levels and will guarantee all lines and levels as are shown on drawings.

Article 38 Unauthorized Work

Work done without lines and grades being established, work done beyond the lines and grades shown on the Plans or as established, except as herein provided, or any extra work done without written authority will be considered as unauthorized and at the expense of the Contractor and will not be measured by the Engineer, or paid for by the County. Work so done may be ordered by the Engineer to be removed and replaced at the Contractor's expense.

IX. CONSTRUCTION

Article 39 Construction Schedule

The Contractor shall hold bi-weekly "progress meetings" at the site, at a time suitable to the Engineer, at which the progress of the work shall be reported upon in detail with reference to schedules. Each interested subcontractor shall be required to have present a competent representative to report the condition of his/her branch of the work and to receive instructions. Minutes of these "progress meetings" shall be taken by the Contractor who shall type them for distribution to members of the conference, the Office of Budget and Finance, Property Management, and other interested persons. These minutes shall be received by all parties prior to the next scheduled "progress meeting."

Article 40 Protection of Work and Property

- A. All trees along the way of access shall be boxed, also all trees surrounding the building which are liable to injury by the moving, storing and working up of materials. No permanent tree shall be used for attachment of any ropes or derricks. Every public way, catch basin, conduit, tree, fence or things injured in carrying out this Contract, shall be replaced and put in good condition, unless the same shall be permanently done away with by order of the Engineer.
- B. The Contractor shall erect and properly maintain at all times as required by the conditions and progress of the work, all necessary safeguards for the protection of workers and the public and shall post danger signs warning against the hazards created by such features of construction as protruding nails, hod hoists, well holes, elevator hatchways, scaffolding, window openings, stairways and falling material.
- C. In an emergency affecting the safety of life, or of the work, or of the adjoining property, the contractor, without special instruction or authorization is hereby permitted to act, at his/her discretion, to prevent such threatened loss or injury, and he/she shall so act, without appeal, if so instructed or authorized. Any compensation claimed by the Contractor on account of emergency work shall be determined as outlined in Article 11.

Article 41 Shoring, Bracing and Sheeting

- A. The Contractor shall do all necessary shoring, bracing and sheeting required, or as directed by the Engineer, to carryout the work, install the foundations and other building construction, to protect the street, sidewalks and all adjoining buildings and property. He/she shall thoroughly brace and protect all earth banks sides of pits, trenches, and other excavations to prevent danger to persons or structures, and to prevent injurious cavings or erosion of any sort. Shoring and sheeting shall be removed after, or as, the walls are built and properly set.
- B. Full responsibility for both the design (by an Engineer licensed in Maryland) and the execution of all shoring, bracing, and sheeting work shall rest upon the contractor. While the Engineer shall be fully advised of all details for such work before the work itself is executed, this shall not in any way relieve the Contractor for full responsibility for all damage or expense arising from faulty installation of the said work of shoring, bracing, or sheeting.

Article 42 Tests

- A. Soils testing shall be performed by an independent testing firm arranged and paid for by the County.

- B. Materials testing shall be performed by an independent testing firm, paid for by the Contractor, which has previously been approved by the County and Architect/Engineer. Certified copies of all such test reports shall be submitted to the Engineer for approval.

Article 43 Cleaning Up

- A. The Contractor shall at all times keep the premises free from accumulations of waste material or rubbish caused by his/her employees or work, and at the completion of the work, shall remove all his/her rubbish from and about the project site, and all his/her tools, scaffolding and surplus material.

In case of dispute, the County may remove the rubbish and charge the cost to the several contractors as the Engineer shall determine to be just.

- B. All debris shall be kept sprinkled to reduce dust and shall be promptly removed from the building, and no combustible materials shall be stored against perimeter walls.
- C. The Contractor shall clean entirely the building as it is completed, wash all windows, scrub all floors at least once, and leave all floors free from spots and blemishes. The interior of the building and the project area shall be left "broom clean," or its equivalent.

Article 44 As-Built Drawings

The Contractor shall, as the project progresses, neatly record on a set of white prints any changes and all revisions to the work wherever they shall differ from the Contract Drawings. Upon completion of the work, the Contractor shall turn over to the Architect this set of prints.

Article 45 Drainage and Pumping

The Contractor shall remove all water, including rain water, encountered during the entire progress of the work, using pumps, drains or other methods approved by the Engineer. Excavations and the project site shall be kept free from water until all backfilling is completed. The water shall be discharged to catch basins, or other drainage points as directed by the Engineer.

Article 46 Temporary Water, Electric and Other Services

- A. The Contractor shall arrange for and pay for the installation of temporary connection to the County's water mains, including all incidental fees and expenses for water supply during construction of the project, and shall pay for all water used. Wasting of County water will not be permitted.

- B. The Contractor shall arrange for and pay for temporary electric light and power service required during construction of the project, and shall pay for all electricity used. Gasoline or other torches for lighting will not be permitted.
- C. The Contractor shall provide and pay for any other temporary services which may be required for the satisfactory completion of the project.
- D. The Contractor shall provide, at his/her own expense, all cold weather protection, temporary heat and fuel as necessary to carry on the work expeditiously during inclement weather, to protect work and materials against injury from dampness and cold, to dry out the building and provide suitable working conditions. Refer to other sections for temperatures required for work under the various trades

The methods of heating and type of fuel and equipment used shall be subject to approval by Engineer.

With special permission, in writing, permanent heating system may be used to dry out building and provide suitable working conditions in all or various parts thereof as soon as practicable. If used, Contractor shall be responsible for use of permanent heating system for purpose described and all costs of fuel, attendance, etc. in connection therewith shall be borne by him/her. Such use shall not relieve Contractor of his/her responsibility to turn over system to Owner in perfect condition on completion of project, including the removal of all dust of construction from air handling units, etc., the replacing of all filters, etc., nor shall it shorten stipulated guarantee period which will commence upon the date of final acceptance of the work.

Article 47 Connecting to Existing Utilities

The Contractor shall, at his/her own cost and expense and as part of this work under the Contract, furnish all labor, materials, tools, and appliances, and do all work required for making connections to existing storm drains, sanitary sewer, water, gas and electric service connections, as shown on drawings, and the cost of making such connections shall be included in his/her bid.

Article 48 Existing Utilities Shown on Plans

Water mains, gas mains, storm drains, sanitary sewers, and other utilities are shown on the Plans, in accordance with the best information available, for the information of the Contractor. The County assumes no responsibility for accuracy or completeness of the information shown. Existing mains and services shall be carefully protected and any damage to them caused by the work shall be immediately repaired to the satisfaction of the Engineer by the Contractor at his own expense, using materials of the quality and kinds damaged.

X. MISCELLANEOUS ADDENDA

Article 49 Holidays

The word "holidays" used in these Contract Documents shall be taken to mean the below listed holidays, which in Baltimore County, occur as shown below:

January 1	New Year's Day
3rd Monday in January	Martin Luther King's Birthday
3rd Monday in February	President's Day
4th Monday in May	Memorial Day
June 19	Juneteenth Independence
July 4	Independence Day
1st Monday in September	Labor Day
2nd Monday in October	Indigenous Peoples' Day
November 11	Veteran's Day
4th Thursday in November	Thanksgiving Day
December 25	Christmas
All Days of General Elections	

If any holiday occurs on Sunday, the following Monday shall be considered a holiday. If the holiday occurs on Saturday, the Friday immediately preceding shall be considered a holiday.

Article 50 Buy American Steel Act

The State of Maryland has approved House Bill No. 1659 to "Buy American Steel" for all Public Works projects in the State of Maryland, effective July 1, 1978. Compliance with Article 20.17 Metal Pipe (Page 100) and Article 20.18 Metal for Structures (Page 102) in the *S.H.A. Specifications for Materials, Highways, Bridges and Incidental Structures* dated March 1968 will satisfy this condition. Also see *Baltimore County's Standard Specifications for Construction and Materials* Section GP 7.28.

Article 51 Guarantee

- A. The Contractor guarantees all work against faulty or imperfect materials, against all imperfect or careless and/or unskilled workmanship, against all leaks and against all mechanical and electrical failure of equipment for a period of two (2) years from the date of acceptance of the project by the County. See other Sections of this Specification for other guarantees.
- B. The Contractor shall remove, replace or re-execute, without cost to the Owner, any work found to be imperfect during the guarantee period.

Article 52 Offices and Telephones

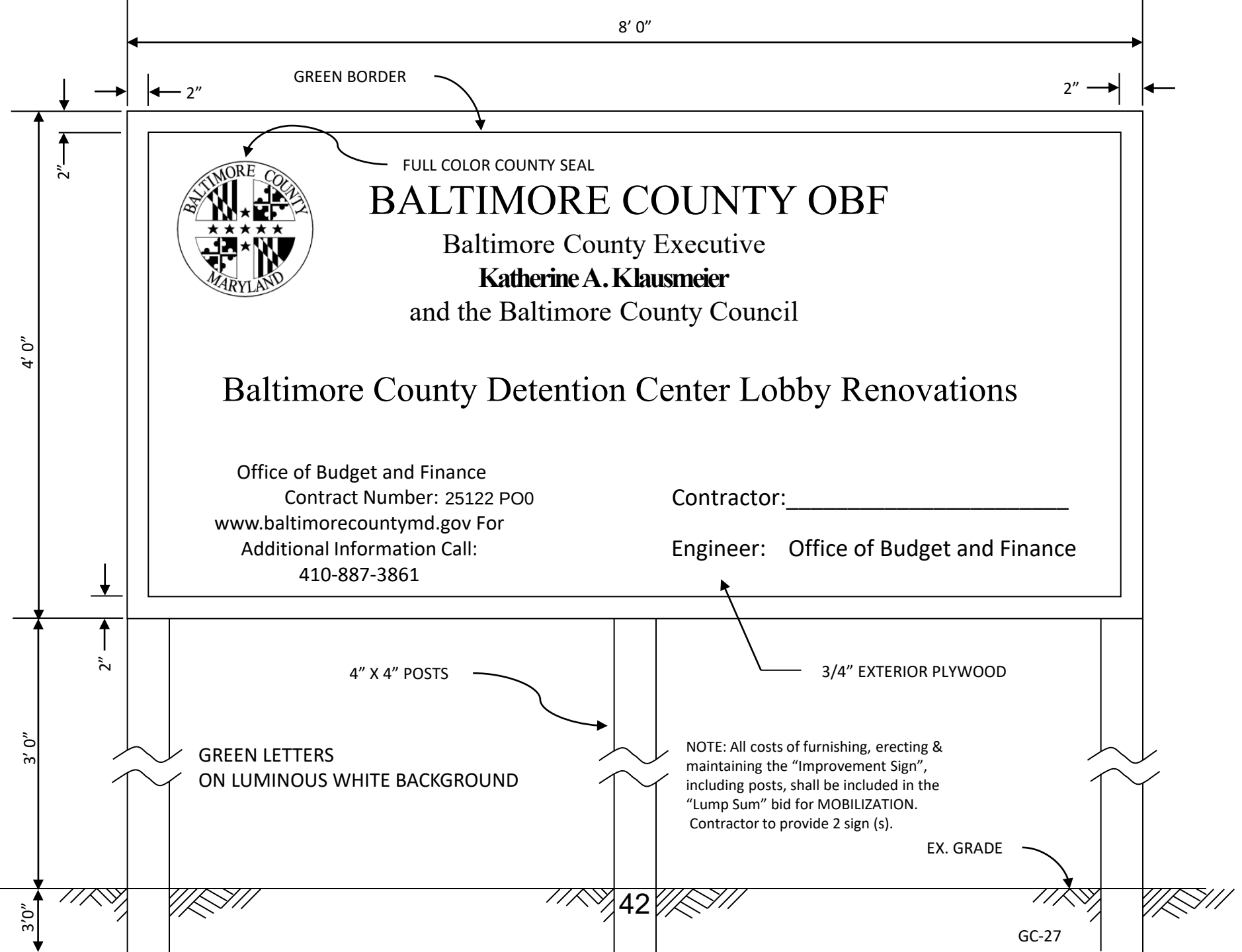
- A. The Contractor shall erect and maintain upon the project site, and where directed by the Engineer, suitable offices for his/her own use and that of the Engineer.

- B. A room of adequate size shall be provided and maintained in the Contractor's office to be used for "Progress Meetings," which frequently involve fifteen (15 or more persons). This space shall be so arranged that they can be held without interference with or from the other office or supervisory work. The room shall be 300 sq. ft. minimum and 10 ft. minimum width.

These offices shall be provided with adequate heating and lighting, all at the expense of the Contractor. In addition to the above requirements, air-conditioning will be required, the cost of which is to be included in the lump sum bid price. The system must be capable of maintaining a temperature of 80 degrees F dry bulb and approximately 50% relative humidity in the conditioned area when outside temperatures are 95 degrees F dry bulb and 78 degrees F wet bulb.

- C. The Engineer's office shall meet or exceed all requirements for a Type 1 office in accordance with *Baltimore County's Standard Specifications for Construction and Materials*, Section 103 Engineer's Office.

The Contractor shall provide telephone and FAX service in the Office of the Engineer. The Contractor shall pay all costs of installation and all charges for local and Baltimore City calls, but will not be expected to pay for long distance calls made from the Engineer's Office.



PROJECT MANUAL
FOR THE
BALTIMORE COUNTY DETENTION CENTER
LOBBY RENOVATION

BALTIMORE COUNTY, MARYLAND

720 Bosley Avenue
Towson, Maryland 21204

Contract Number – 25122 PO0
Job Order Number – PROJ-10001187

BALTIMORE COUNTY OFFICE OF BUDGET & FINANCE – PROPERTY MANAGEMENT

100% CONSTRUCTION DOCUMENTS
June 13, 2025

A/E Design Team

Architect: **Murphy & Dittenhafer Architects**, Baltimore, MD.

Mechanical/Electrical Engineers: **BOWMAN**, Baltimore, MD.

Plumbing/Fire Protection: **Setty**, Baltimore, MD.

Structural Engineers: **Columbia Engineering**, Columbia, MD.

IT / Telecom / Data/ Security & Acoustics: **Convergent Technologies Design Group, Inc**, Baltimore, MD.

Professional Cost Estimator: **MK Consulting Engineers**, Baltimore, MD

**TABLE OF CONTENTS
OF THE PROJECT MANUAL**

FOR

**Baltimore County Detention Center
Lobby Renovation
SPECIFICATIONS**

The arrangement of the Project Manual has been established on the MASTERFORMAT (2009 version) of the CONSTRUCTION SPECIFICATIONS INSTITUTE. The following Table of Contents lists certain Bidding and Contract Documents which are made part of this Project Manual by reference.

SECTION 00 00 02 - TABLE OF CONTENTS

DIVISION 00 - BIDDING AND CONTRACT REQUIREMENTS

00000 COVER PAGE
00002 TABLE OF CONTENTS

DIVISION 01 - GENERAL REQUIREMENTS

01 10 00 SUMMARY OF WORK
01 25 00 SUBSTITUTION PROCEDURES
01 26 00 CONTRACT MODIFICATIONS
01 29 00 PAYMENT PROCEDURES
01 31 00 PROJECT MANAGEMENT AND COORDINATION
01 32 00 CONSTRUCTION PROGRESS DOCUMENTATION
01 32 33 PHOTOGRAPHIC DOCUMENTATION
01 33 00 SUBMITTAL PROCEDURES
01 40 00 QUALITY REQUIREMENTS
01 50 00 TEMPORARY FACILITIES AND CONTROLS
01 60 00 PRODUCT REQUIREMENTS
01 73 00 EXECUTION
01 77 00 CLOSEOUT PROCEDURES
01 78 23 OPERATION AND MAINTENANCE DATA
01 78 39 PROJECT RECORDS DOCUMENTS

DIVISION 02 – EXISTING CONDITIONS

02 41 19 SELECTIVE DEMOLITION

DIVISION 03 – CONCRETE

Not Used

DIVISION 04 – MASONRY

04 20 00 UNIT MASONRY

DIVISION 05 – METALS

Not Used

DIVISION 06 – WOOD, PLASTICS, AND COMPONENTS

06 10 00 ROUGH CARPENTRY
06 40 23 INTERIOR ARCHITECTURAL WOODWORK

DIVISION 07 – THERMAL AND MOISTURE PROTECTION

07 21 00 INSULATION
07 92 00 JOINT SEALANTS

DIVISION 08 – OPENINGS

08 11 13 HOLLOW METAL DOORS AND FRAMES
08 14 16 FLUSH WOOD DOORS
08 56 53.25 BULLET RESISTANT STOREFRONT
08 56 53 BULLET RESISTANT TRANSACTION WINDOW
08 71 00 DOOR HARDWARE
08 80 00 GLAZING

DIVISION 09 – FINISHES

09 29 00 GYPSUM BOARD ASSEMBLIES
09 29 53 PARTITION GAP ENCLOSURES
09 31 00 CERAMIC TILE
09 51 23 ACOUSTICAL PANEL CEILINGS
09 65 30 RESILIENT WALL BASE AND ACCESSORIES
09 68 10 CARPET TILE
09 91 00 PAINTING

DIVISION 10 – SPECIALTIES

10 26 41 BULLET RESISTANT PANELS
10 50 50 METAL LOCKERS

DIVISION 11 – EQUIPMENT

Not Used

DIVISION 12 - FURNISHINGS

Not Used

DIVISION 13 - SPECIAL CONSTRUCTION

Not Used

DIVISION 14 – CONVEYING EQUIPMENT

Not Used

DIVISION 21 – FIRE SUPPRESSION

210517 SLEEVES AND SLEEVE SEALS FOR FIRE SUPPRESSION PIPING
210518 ESCUTCHEONS FOR FIRE SUPPRESSION PIPING
210529 HANGERS AND SUPPORTS FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT
210553 IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT
211313 WET-PIPE SPRINKLER SYSTEMS

DIVISION 22 – PLUMBING

Not Used

DIVISION 23 – HVAC

23 05 00 COMMON WORK RESULTS FOR HVAC
23 05 29 HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT
23 05 93 TESTING ADJUSTING BALANCING FOR HVAC
23 07 00 HVAC INSULATION
23 30 00 HVAC AIR DISTRIBUTION

DIVISION 26 – ELECTRICAL

26 05 00	COMMON WORK RESULTS FOR ELECTRIC
26 05 19	CONDUCTORS & CABLES
26 05 26	GROUNDING
26 05 33	RACEWAYS & BOXES
26 20 00	PANELS & SWITCHGEAR
26 27 26	WIRING DEVICES
26 50 00	LIGHTING

DIVISION 27 – COMMUNICATIONS

27 05 26	GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS
27 05 28	TELECOMMUNICATIONS CABLING INFRASTRUCTURE
27 05 28.36	CABLE TRAYS FOR COMMUNICATION SYSTEMS
27 41 13	MULTIMEDIA SYSTEMS FLOOR BOX

DIVISION 28 – ELECTRONIC SAFETY AND SECURITY

28 06 00	COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY
284621.11	ADDRESSABLE FIRE ALARM SYSTEMS

END OF TABLE OF CONTENTS

SECTION 01 10 00 – SUMMARY OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Related Requirements:
 - 1. Division 01 Section "Temporary Facilities and Controls" for limitations and procedures governing temporary use of Owner's facilities.
- B. Section Includes:
 - 1. Project information
 - 2. Work Covered by Contract Documents
 - 3. Phased construction.
 - 4. Work Performed by Owner
 - 5. Owner-Furnished/Contractor-Installed (OFCI) Products
 - 6. Owner-Furnished/Owner-Installed (OFOI) Products
 - 7. Contractor's Use of Site and Premises
 - 8. Coordination with Occupants
 - 9. Work Restrictions
 - 10. Specifications and drawings conventions

1.3 DEFINITIONS

- A. Work Package: A group of specifications, drawings, and schedules prepared by the design team to describe a portion of the Project Work for pricing, permitting, and construction.

1.4 PROJECT INFORMATION

- A. Project Identification: Baltimore County Detention Center
Lobby Renovation
- B. Project Location: 720 Bosley Avenue
Towson, Maryland 21204
- C. Project Number: Contract Number:
Job Order Number:

- D. Owner: Baltimore County Property Management, Office of Budget & Finance
 - 1. Owner's Representatives:
 - a. Derrick Guilbault, Project Management Specialist, Baltimore County Property Management; Ph: 410-887-6237.
- E. Architect: Murphy & Dittenhafer Architects, Inc. 805 North Charles Street; Baltimore, Maryland 21201; Ph: 410-625-4823
- F. Architect's Consultants: The Architect has retained the following design professionals who have prepared designated portions of the Contract Documents:
 - 1. Structural Engineer: Columbia Engineering, 6210 Old Dobbin Lane #150, Columbia, MD; Ph. 410.992.9970
 - 2. Civil Engineering: MK Consulting Engineers, The Star Building, 1801 Porter Street, Suite 401, Baltimore, MD 21230; Ph. 667.309.6193
 - 3. ME Engineer: Bowman Engineering, 300 East Joppa Road, Suite 501, Towson, MD 21286; Ph. 410.494.1111
 - 4. Low Voltage Design: Convergent Technologies Group; 6501 York Road; Baltimore, Maryland 21212; Ph. 410-532-2395
 - 5. Plumbing/Fire Protection: Setty; 145 W. Ostend Street, Baltimore, MD 21230; Ph. 667.309.6036

1.5 WORK COVERED BY CONTRACT DOCUMENTS

- A. The Work of Project is defined by the Contract Documents and includes, but is not limited to, the following:
 - 1. The work includes interior renovations to the main lobby to install a secure reception desk and renovate the security check points; a new office will be constructed; and finishes will be upgraded. A second staff entrance will be created from an existing exterior door. New security check points will be constructed; existing partitions will be modified and new partition walls will be installed. Three new offices will be constructed. Finishes will be upgraded. Project will be constructed under a General Construction Contract.
- B. Removal and disposal of materials:
 - 1. Non-hazardous materials shall be removed in accordance with Spec. Section 02 41 19.
- C. Refer to Bid Documents for other contract requirements.

1.6 CONSTRUCTION

- A. Contractor shall provide a schedule for the construction of the work. The Contractor shall provide any means and methods necessary to meet the required Operations and Access criteria listed below.
 - 1. Operations & Access
 - a. Access: The BCDC Staff, BCPMs, and County OIT shall have access to the continuously operated portion of the building during construction. Access will include access to designated entrances for ingress and egress, a lane for vehicles to access parking and enter and exit freely. Access means 24 hour, seven days a week

access. The public is to have access to the designated public parking and public building entrance. Coordinate this with the owner.

- b. Continuous Operations: BCDC shall be continuously able to operate and be provided with functional power and network operations, MEP systems and Fire Alarm & Sprinkler systems. The Contractor shall provide notice and grant right of entry provided to Baltimore County Property Management's (BCPM) Information Technology staff to access the main IT room for the duration of the project. Any temporary outages related to connection of new utilities shall be carefully coordinated with BCDC operations so as to limit disruptions.
- c. Utilities: All utilities are required for BCDC and Information Technology operations. Reference MEP, & TA drawings and specifications.
 - a. BCDC are to be notified of work that impacts utilities or requires an outage of service. The Contractor will need to provide 48 business hours' notice to BCDC via BCPM for scheduled work that impacts daily operations.
- d. Life Safety: The Contractor shall be responsible for coordination, permitting and inspection of all aspects of Life Safety and all other inspections required by the (AHJ) Authority Having Jurisdiction per the Contractor's phasing plans. Protect access and egress for all BCDC staff and BCPM IT staff in areas near the work. Pedestrian pathways shall be required. The Contractor shall provide a safety procedures plan.

1.7 OWNER-FURNISHED/CONTRACTOR-INSTALLED (OFCI) PRODUCTS

- A. Owner's Responsibilities: Owner will furnish products indicated and perform the following, as applicable:
 - 1. Review and confirm with the Architect as needed Product Data, Shop Drawings, and Samples.
 - 2. Provide for delivery of Owner-furnished products to Project site.
 - 3. Upon delivery, inspect, with Contractor present, delivered items.
 - a. If Owner-furnished products are damaged, defective, or missing, arrange for replacement.
 - 4. Obtain manufacturer's inspections, service, and warranties.
 - 5. Inform Contractor of earliest available delivery date for Owner-furnished products.
- B. Contractor's Responsibilities: The Work includes the following, as applicable:
 - 1. Designate delivery dates of Owner-furnished products in Contractor's construction schedule, utilizing Owner-furnished earliest available delivery dates.
 - 2. Review Owner-reviewed Product Data, Shop Drawings, and Samples, noting discrepancies and other issues in providing for Owner-furnished products in the Work.
 - 3. Receive, unload, handle, store, protect, and install Owner-furnished products.
 - 4. Make building services connections for Owner-furnished products.
 - 5. Protect Owner-furnished products from damage during storage, handling, and installation and prior to Substantial Completion.
 - 6. Repair or replace Owner-furnished products damaged following receipt.
- C. Owner-Furnished/Contractor-Installed (OFCI) Products:

1. Furniture as indicated on the Drawings.
2. Salvage List: Refer to Demolition Drawings. GC to coordinate salvage items prior to demolition work.

1.8 OWNER-FURNISHED/OWNER-INSTALLED (OFOI) PRODUCTS

- A. The Owner will furnish and install products indicated as Not in Contract (NIC). All other fixtures & equipment documented in the drawings shall be provided by GC.
- B. Owner-Furnished/Owner-Installed (OFOI) Products:
 1. FF&E, new and existing to be reused furnishings will be stored off site and installed after U&O has been granted to completed phased areas.

1.9 SITE AND PREMISES

- A. Use of Site: Contractor shall coordinate with Owner the use of Project site for construction operations during construction period. Contractor's use of Project site is limited only by Owner's right to perform work or to retain other contractors on portions of Project.
- B. Condition of Existing Grounds: Maintain portions of existing grounds, landscaping, and hardscaping affected by construction operations throughout construction period. Repair damage caused by construction operations.

1.10 WORK RESTRICTIONS – AS NOTED IN BID DOCUMENTS

1.11 SPECIFICATION AND DRAWING CONVENTIONS

- A. Specification Content: The Specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:
 1. Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.
 2. Specification requirements are to be performed by Contractor unless specifically stated otherwise.
- B. Division 01 General Requirements: Requirements of Sections in Division 01 apply to the Work of all Sections in the Specifications.
- C. Drawing Coordination: Requirements for materials and products identified on Drawings are described in detail in the Specifications. One or more of the following are used on Drawings to identify materials and products:
 1. Terminology: Materials and products are identified by the typical generic terms used in the individual Specifications Sections.

2. Abbreviations: Materials and products are identified by abbreviations scheduled on Drawings.
3. Keynoting: Materials and products are identified by reference keynotes referencing Specification Division numbers found in this Project Manual followed by a decimal and then an item number. This item number does not reference a specification section or paragraph.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 00

SECTION 01 25 00 - SUBSTITUTION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for substitutions made after award of the Contract.

1.3 DEFINITIONS

- A. Substitutions: Products considered to be able to perform the same function but not necessarily have the same design, arrangement, details, utility requirements and/or dimensions. Changes in products, materials, and equipment required by the Contract Documents proposed by the Contractor after award of the Contract are considered to be requests for substitutions. The following are not considered to be requests for substitutions:
 - 1. Revisions to the Contract Documents requested by the Owner or Architect.
 - 2. Specified options of products or "approved equals" as permitted and included in the Contract Documents.
 - 3. The Contractor's determination of and compliance with governing regulations and orders issued by governing authorities.
- B. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
- C. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required to meet other Project requirements but may offer advantage to Contractor or Owner.

1.4 ACTION SUBMITTALS

- A. General: No substitution requests will be considered from manufacturer's representatives or product vendors unless submitted through the Contractor. No substitution requests will be considered during the bid period. Bids shall be based on products from one of the manufacturers specified or an "or equal" product.
- B. Substitution Requests: Submit documentation identifying product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.

1. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
 - a. Statement indicating why specified product or fabrication or installation method cannot be provided, if applicable.
 - b. Coordination of information, including a list of changes or revisions needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
 - c. Detailed comparison of significant qualities of proposed substitutions with those of the Work specified. Include annotated copy of applicable Specification Section. Significant qualities may include attributes, such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
 - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
 - e. Samples, where applicable or requested.
 - f. Certificates and qualification data, where applicable or requested.
 - g. List of similar installations for completed projects, with project names and addresses as well as names and addresses of architects and owners.
 - h. Material test reports from a qualified testing agency, indicating and interpreting test results for compliance with requirements indicated.
 - i. Detailed comparison of Contractor's construction schedule using proposed substitutions with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
 - j. Cost information, including a proposal of change, if any, in the Contract Sum.
 - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents, except as indicated in substitution request, is compatible with related materials and is appropriate for applications indicated.
 - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
2. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within (15) days of receipt of request, or (8) days of receipt of additional information or documentation, whichever is later.
 - a. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.5 QUALITY ASSURANCE

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

1.6 PROCEDURES

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

1.7 SUBSTITUTIONS

- A. Substitutions for Cause: Submit requests for substitution immediately on discovery of need for change, but not later than (15) days prior to time required for preparation and review of related submittals.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

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

- B. Substitutions for Convenience: Architect will consider requests for substitution if received within (60) days after the Notice of Award. Requests received after that time may be considered or rejected at discretion of Architect.

- 1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:

- a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
 - b. Requested substitution does not require extensive revisions to the Contract Documents.
 - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
 - d. Substitution request is fully documented and properly submitted.
 - e. Requested substitution will not adversely affect Contractor's construction schedule.
 - f. Requested substitution has received necessary approvals of authorities having jurisdiction.
 - g. Requested substitution is compatible with other portions of the Work.
 - h. Requested substitution has been coordinated with other portions of the Work.
 - i. Requested substitution provides specified warranty.

- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 25 00

SECTION 01 26 00 - CONTRACT MODIFICATION PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for handling and processing Contract modifications.
- B. Related Requirements:
 - 1. Division 01 Section "Substitution Procedures" for administrative procedures for handling requests for substitutions made after the Contract award.
 - 2. Division 01 Section "Project Management and Coordination" for requirements for forms for contract modifications provided as part of web-based Project management software.

1.3 MINOR CHANGES IN THE WORK

- A. Architect will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.

1.4 PROPOSAL REQUESTS

- A. Owner-Initiated Proposal Requests: The Architect will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time. If necessary, the description will include supplemental or revised Drawings and Specifications.
 - 1. Work Change Proposal Requests issued by the Architect are not instructions either to stop work in progress or to execute the proposed change.
 - 2. Within (14) days, when not otherwise specified, after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.
 - a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.

- d. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
- B. Contractor-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Contractor may initiate a claim by submitting a request for a change to the Owner.
1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 4. Include costs of labor and supervision directly attributable to the change.
 5. Include an updated Contractor's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 6. Comply with requirements in Section 012500 "Substitution Procedures" if the proposed change requires substitution of one product or system for product or system specified.

1.5 CHANGE ORDER PROCEDURES

- A. On Owner's approval of a Work Change Proposal Request, the Contractor will issue a Change Order for signatures of Owner and Contractor.

1.6 CONSTRUCTION CHANGE DIRECTIVE

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

BCDC LOBBY RENOVATION
BALTIMORE COUNTY, MARYLAND
JOB ORDER NUMBER – PROJ-10001187
CONTRACT NUMBER – 25122 PO0

PROJECT MANUAL
100% CONSTRUCTION DOCUMENTS
6-13-2025

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

SECTION 01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.

1.3 DEFINITIONS

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

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Contractor's construction schedule.
 - 1. Coordinate line items in the schedule of values with items required to be indicated as separate activities in Contractor's construction schedule.
 - 2. Submit the schedule of values to Architect at earliest possible date, but no later than five (5) days after Notice to Proceed.
- B. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
 - 1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Owner's name.
 - c. Owner's Project number.
 - d. Name of Architect.
 - e. Architect's Project number.
 - f. Contractor's name and address.
 - g. Date of submittal.
 - 2. Arrange the schedule of values in tabular form, with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or division.

- b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent. Round dollar amounts to whole dollars, with total equal to Contract Sum.
 - 1) Labor.
 - 2) Materials.
 - 3) Equipment.
3. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Principal subcontract amounts should be broken down into multiple Items. Each Item should be complete including its total cost and proportionate share of general and administrative overhead and profit. All dollar amounts should be rounded to the nearest whole dollar. The total of all the Items should equal the Contract price.
- a. The maximum value of any activity is \$25,000.
4. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
- a. Differentiate between items stored on-site and items stored off-site.
5. Temporary Facilities: Show cost of temporary facilities and other major cost items that are not direct cost of actual work-in-place as separate line items.
6. Closeout Costs. Include separate line items under Contractor and principal subcontracts for Project closeout requirements in an amount totaling (5) percent of the Contract Sum and subcontract amount.
7. Schedule of Values Revisions: Revise the schedule of values when Change Orders or Construction Change Directives result in a change in the Contract Sum. Include at least one separate line item for each Change Order and Construction Change Directive.
8. Submittal for preliminary and monthly progress submittals for Building Product Calculator (BPC), Construction and Demolition Waste Management Plan and Indoor Air Quality Plan.

1.5 APPLICATIONS FOR PAYMENT

- A. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments, as certified by Architect and paid for by Owner.
- B. Payment Application Times: Submit Application for Payment to the Owner by the 25th of the month. The period covered by each Application for Payment is one month, ending on the last day of the month.
 - 1. Submit draft copy of Application for Payment (7) days prior to due date for review by Architect.
- C. Application for Payment Forms: Use AIA Document G702 and AIA Document G703 as form for Applications for Payment.

1. Other Application for Payment forms proposed by the Contractor may be acceptable to Architect and Owner. Submit forms for approval with initial submittal of schedule of values.
- D. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Contractor. The Owner will return incomplete applications without action.
 1. Entries shall match data on the schedule of values and Contractor's construction schedule. Use updated schedules if revisions were made.
 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
- E. Stored Materials: Include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 1. Provide certificate of insurance, evidence of transfer of title to Owner, and consent of surety to payment for stored materials.
 2. Provide supporting documentation that verifies amount requested, such as paid invoices. Match amount requested with amounts indicated on documentation; do not include overhead and profit on stored materials.
 3. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- F. Transmittal: Submit (3) signed and notarized original copies of each Application for Payment to the Owner by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments if required.
 1. Transmit each copy with a transmittal form listing attachments and recording appropriate information about application.
- G. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's lien from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application.
 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 2. When an application shows completion of an item, submit conditional final or full waivers.
 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.
 5. Waiver Forms: Submit executed waivers of lien on forms acceptable to Owner.

- H. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. Contractor's construction schedule (preliminary if not final).
 4. Products list (preliminary if not final).
 5. Sustainable design action plans, including preliminary project materials cost data.
 6. Submittal schedule (preliminary if not final).
 7. List of Contractor's staff assignments.
 8. List of Contractor's principal consultants.
 9. Copies of building permits.
 10. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 11. Initial progress report.
 12. Report of preconstruction conference.
- I. Application for Payment at Substantial Completion: After Architect issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 - a. Complete administrative actions, submittals, and Work preceding this application, as described in Division 01 Section "Closeout Procedures."
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
 3. Administrative actions and/or submittals that shall precede or coincide with this application include:
 - a. Occupancy permits and similar approvals.
 - b. Warranties (guarantees) and maintenance agreements.
 - c. Test/adjust/balance records.
 - d. Maintenance instructions.
 - e. Startup performance reports.
 - f. Changeover information related to Owner's occupancy, use, operation, and maintenance.
 - g. Final cleaning.
 - h. Application for reduction of retainage and consent of surety.
 - i. Advice on shifting insurance coverages.
 - j. List of incomplete Work, recognized as exceptions to Architect's Certificate of Substantial Completion.
- J. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Certification of completion of final punch list items.
 3. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 4. Updated final statement, accounting for final changes to the Contract Sum.

5. AIA Document G706.
6. AIA Document G706A.
7. AIA Document G707.
8. Evidence that claims have been settled.
9. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
10. Final liquidated damages settlement statement.
11. Proof that taxes, fees, and similar obligations are paid.
12. Waivers and releases.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

SECTION 01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project, including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Coordination drawings.
 - 3. RFIs.
 - 4. Project meetings.
- B. Related Requirements:
 - 1. Division 01 Section "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
 - 2. Division 01 Section "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
 - 3. Division 01 Section "Closeout Procedures" for coordinating closeout of the Contract.

1.3 DEFINITIONS

- A. BIM: Building Information Modeling.
- B. RFI: Request for Information. Request from Owner, Architect, or Contractor seeking information required by or clarifications of the Contract Documents.

1.4 INFORMATIONAL SUBMITTALS

- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, telephone number, and email address of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.

- B. Key Personnel Names: Within 15 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Identify individuals and their duties and responsibilities; list addresses, cellular telephone numbers, and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in temporary field office. Keep list current at all times.

1.5 GENERAL COORDINATION PROCEDURES

- A. Coordination: Coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations included in different Sections that depend on each other for proper installation, connection, and operation.
 - 1. Schedule construction operations in sequence required to obtain the best results, where installation of one part of the Work depends on installation of other components, before or after its own installation.
 - 2. Coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair.
 - 3. Make adequate provisions to accommodate items scheduled for later installation.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 - 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 - 1. Preparation of Contractor's construction schedule.
 - 2. Preparation of the schedule of values.
 - 3. Installation and removal of temporary facilities and controls.
 - 4. Delivery and processing of submittals.
 - 5. Progress meetings.
 - 6. Preinstallation conferences.
 - 7. Project closeout activities.
 - 8. Startup and adjustment of systems.

1.6 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Prepare coordination drawings according to requirements in individual Sections, and additionally where installation is not completely indicated on Shop Drawings, where limited space availability necessitates coordination, or if coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
 - 1. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:

- a. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
- b. Coordinate the addition of trade-specific information to coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
- c. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
- d. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
- e. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
- f. Indicate required installation sequences.
- g. Indicate dimensions shown on Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternative sketches to Architect indicating proposed resolution of such conflicts. Minor dimension changes and difficult installations will not be considered changes to the Contract.

B. Coordination Drawing Organization: Organize coordination drawings as follows:

1. Floor Plans and Reflected Ceiling Plans: Show architectural and structural elements, and mechanical, plumbing, fire-protection, fire-alarm, and electrical Work. Show locations of visible ceiling-mounted devices relative to acoustical ceiling grid. Supplement plan drawings with section drawings where required to adequately represent the Work.
2. Plenum Space: Indicate subframing for support of ceiling, and wall systems, mechanical and electrical equipment, and related Work. Locate components within plenums to accommodate layout of light fixtures and other components indicated on Drawings. Indicate areas of conflict between light fixtures and other components.
3. Mechanical Rooms: Provide coordination drawings for mechanical rooms, showing plans and elevations of mechanical, plumbing, fire-protection, fire-alarm, and electrical equipment.
4. Structural Penetrations: Indicate penetrations and openings required for all disciplines.
5. Slab Edge and Embedded Items: Indicate slab edge locations and sizes and locations of embedded items for metal fabrications, sleeves, anchor bolts, bearing plates, angles, door floor closers, slab depressions for floor finishes, curbs and housekeeping pads, and similar items.
6. Mechanical and Plumbing Work: Show the following:
 - a. Sizes and bottom elevations of ductwork, piping, and conduit runs, including insulation, bracing, flanges, and support systems.
 - b. Dimensions of major components, such as dampers, valves, diffusers, access doors, cleanouts and electrical distribution equipment.
 - c. Fire-rated enclosures around ductwork.
7. Electrical Work: Show the following:
 - a. Runs of vertical and horizontal conduit 1-1/4 inches in diameter and larger.
 - b. Light fixture, exit light, emergency battery pack, smoke detector, and other fire-alarm locations.
 - c. Panel board, switchboard, switchgear, transformer, busway, generator, and motor-control center locations.
 - d. Location of pull boxes and junction boxes, dimensioned from column center lines.

8. Fire-Protection System: Show the following:
 - a. Locations of standpipes, mains piping, branch lines, pipe drops, and sprinkler heads.
9. Review: Architect will review coordination drawings to confirm that, in general, the Work is being coordinated, but not for the details of the coordination, which are Contractor's responsibility. If Architect determines that coordination drawings are not being prepared in sufficient scope or detail, or are otherwise deficient, Architect will so inform Contractor, who shall make suitable modifications and resubmit.

C. Coordination Drawing Process: Prepare coordination drawings in the following manner:

1. Schedule submittal and review of Fire Sprinkler, Plumbing, HVAC, and Electrical Shop Drawings to make required changes prior to preparation of coordination drawings.
2. Commence routing of coordination drawing files with HVAC Installer, who will provide drawing plan files denoting approved ductwork. HVAC Installer will locate ductwork and piping on a single layer, using orange color. Forward drawings to Plumbing Installer.
3. Plumbing Installer will locate plumbing and equipment on a single layer, using blue color.
4. Fire Sprinkler Installer will locate piping and equipment, using red color. Fire Sprinkler Installer shall forward drawing files to Electrical Installer.
5. Electrical Installer will indicate service and feeder conduit runs and equipment in green color. Electrical Installer shall forward drawing files to Communications and Electronic Safety and Security Installer.
6. Communications and Electronic Safety and Security Installer will indicate cable trays and cabling runs and equipment in purple color. Communications and Electronic Safety and Security Installer shall forward completed drawing files to Contractor.
7. Contractor shall perform the final coordination review. As each coordination drawing is completed, Contractor will meet with Architect to review and resolve conflicts on the coordination drawings.

1.7 REQUEST FOR INFORMATION (RFI)

- A. General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified.
 1. Architect will return without response those RFIs submitted to Architect by other entities controlled by Contractor.
 2. Coordinate and submit RFIs in a prompt manner to avoid delays in Contractor's work or work of subcontractors.
- B. Content of the RFI: Include a detailed, legible description of item needing information or interpretation and the following:
 1. Project name.
 2. Owner name.
 3. Owner's Project number.
 4. Name of Architect.
 5. Architect's Project number.
 6. Date.
 7. Name of Contractor.
 8. RFI number, numbered sequentially.
 9. RFI subject.

10. Specification Section number and title and related paragraphs, as appropriate.
 11. Drawing number and detail references, as appropriate.
 12. Field dimensions and conditions, as appropriate.
 13. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
 14. Contractor's signature.
 15. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.
 - a. Include dimensions, thicknesses, structural grid references, and details of affected materials, assemblies, and attachments on attached sketches.
- C. RFI Forms: Software-generated form with substantially the same content as indicated above, acceptable to Architect.
1. Attachments shall be electronic files in PDF format.
- D. Architect's Action: Allow (5) days for Architect's response for each RFI. RFIs received by Architect after 1:00 p.m. will be considered as received the following working day.
1. The following Contractor-generated RFIs will be returned without action:
 - a. Requests for approval of submittals.
 - b. Requests for approval of substitutions.
 - c. Requests for approval of Contractor's means and methods.
 - d. Requests for coordination information already indicated in the Contract Documents.
 - e. Requests for adjustments in the Contract Time or the Contract Sum.
 - f. Requests for interpretation of Architect's actions on submittals.
 - g. Incomplete RFIs or inaccurately prepared RFIs.
 2. Architect's action may include a request for additional information, in which case Architect's time for response will date from time of receipt by Architect of additional information.
 3. Architect's action on RFIs that may result in a change to the Contract Time or the Contract Sum may be eligible for Contractor to submit Change Proposal according to Division 01 Section "Contract Modification Procedures."
 - a. If Contractor believes the RFI response warrants change in the Contract Time or the Contract Sum, notify Architect and Owner in writing within [3] days of receipt of the RFI response.
- E. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
- F. On receipt of Architect's action, update the RFI log and immediately distribute the RFI response to affected parties. Review response and notify Architect within (3) days if Contractor disagrees with response.

1.8 DIGITAL PROJECT MANAGEMENT PROCEDURES

- A. Web-Based Project Management Software Package: Contractor may use web-based Project management software for purposes of hosting and managing Project communication and

documentation with Architect until Final Completion; however, all communication and documentation with the Owner must be directly via email.

1. Web-based Project management software includes the following features:
 - a. Compilation of Project data, including Contractor, subcontractors, Architect, Architect's consultants, and other entities involved in Project. Include names of individuals and contact information. Note that the Owner will not utilize the project management software and all submittals to the Owner shall be via email.
 - b. Access control for each entity for each workflow process, to determine entity's digital rights to create, modify, view, and print documents.
 - c. Document workflow planning, allowing customization of workflow between project entities.
 - d. Creation, logging, tracking, and notification for Project communications required in other Specification Sections, including, but not limited to, RFIs, submittals, Minor Changes in the Work, Construction Change Directives, and Change Orders.
 - e. Track status of each Project communication in real time, and log time and date when responses are provided.
 - f. Procedures for handling PDFs or similar file formats, allowing markups by each entity. Provide security features to lock markups against changes once submitted.
 - g. Creating and distributing meeting minutes.
 - h. Document management for Drawings, Specifications, and coordination drawings, including revision control.
 - i. Management of construction progress photographs.
 - j. Mobile device compatibility, including smartphones and tablets.
2. At completion of Project, provide digital archive in format that is readable by common desktop software applications in format acceptable to Architect. Provide data in locked format to prevent further changes.

B. PDF Document Preparation: Where PDFs are required to be submitted to Architect, prepare as follows:

1. Assemble complete submittal package into a single indexed file, incorporating submittal requirements of a single Specification Section and transmittal form with links enabling navigation to each item.
2. Name file with submittal number or other unique identifier, including revision identifier.
3. Certifications: Where digitally submitted certificates and certifications are required, provide a digital signature with digital certificate on where indicated.

1.9 PROJECT MEETINGS

A. General: Contractor will schedule and conduct meetings and conferences at Project site unless otherwise indicated.

1. Attendees: Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Owner and Architect of scheduled meeting dates and times a minimum of seven days prior to meeting.
2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
3. Minutes: Entity responsible for conducting meeting will record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner and Architect, within (5) days of the meeting.

- B. Preconstruction Conference: Owner will schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner and Architect, but no later than 15 days after execution of the Agreement.
1. Attendees: Authorized representatives of Owner, Owner's Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 2. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Responsibilities and personnel assignments.
 - b. Tentative construction schedule.
 - c. Phasing, if applicable.
 - d. Critical work sequencing and long lead items.
 - e. Designation of key personnel and their duties.
 - f. Lines of communications.
 - g. Procedures for processing field decisions and Change Orders.
 - h. Procedures for RFIs.
 - i. Procedures for testing and inspecting.
 - j. Procedures for processing Applications for Payment.
 - k. Distribution of the Contract Documents.
 - l. Submittal procedures.
 - m. Preparation of Record Documents.
 - n. Use of the premises.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- C. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity when required by other Sections and when required for coordination with other construction.
1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Architect of scheduled meeting dates.
 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.

- c. Related RFIs.
 - d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Review of mockups.
 - i. Possible conflicts.
 - j. Compatibility requirements.
 - k. Time schedules.
 - l. Weather limitations.
 - m. Manufacturer's written instructions.
 - n. Warranty requirements.
 - o. Compatibility of materials.
 - p. Acceptability of substrates.
 - q. Temporary facilities and controls.
 - r. Space and access limitations.
 - s. Regulations of authorities having jurisdiction.
 - t. Testing and inspecting requirements.
 - u. Installation procedures.
 - v. Coordination with other work.
 - w. Required performance results.
 - x. Protection of adjacent work.
 - y. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- D. Project Closeout Conference: Contractor will schedule and conduct a project closeout conference, at a time convenient to Owner and Architect, but no later than (90) days prior to the scheduled date of Substantial Completion.
- 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner, Architect, and their consultants; Contractor and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:
 - a. Preparation of Record Documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for preparing operations and maintenance data.
 - e. Requirements for delivery of material samples, attic stock, and spare parts.
 - f. Requirements for demonstration and training.
 - g. Preparation of Contractor's punch list.

- h. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - i. Submittal procedures.
 - j. Owner's partial occupancy requirements.
 - k. Installation of Owner's furniture, fixtures, and equipment.
 - l. Responsibility for removing temporary facilities and controls.
 - 4. Minutes: Entity conducting meeting will record and distribute meeting minutes.
- E. Progress Meetings: Contractor will conduct progress meetings at biweekly intervals.
 - 1. Attendees: In addition to representatives of Owner, and Architect, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Contractor's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.
 - b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Deliveries.
 - 5) Off-site fabrication.
 - 6) Access.
 - 7) Site use.
 - 8) Temporary facilities and controls.
 - 9) Progress cleaning.
 - 10) Quality and work standards.
 - 11) Status of correction of deficient items.
 - 12) Field observations.
 - 13) Status of RFIs.
 - 14) Status of Proposal Requests.
 - 15) Pending changes.
 - 16) Status of Change Orders.
 - 17) Pending claims and disputes.
 - 18) Documentation of information for payment requests.
 - 3. Minutes: Entity responsible for conducting the meeting will record and distribute the meeting minutes to each party present and to parties requiring information.

- a. Schedule Updating: Revise Contractor's construction schedule after each progress meeting, where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 31 00

SECTION 01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Startup construction schedule.
 - 2. Contractor's Construction Schedule.
 - 3. Construction schedule updating reports.
 - 4. Daily construction reports.
 - 5. Material location reports.
 - 6. Site condition reports.
 - 7. Unusual event reports.
- B. Related Requirements:
 - 1. Division 01 Section "Quality Requirements" for schedule of tests and inspections.
 - 2. Division 01 Section "Payment Procedures" for schedule of values and requirements for use of cost-loaded schedule for Applications for Payment.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction Project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. Cost Loading: The allocation of the schedule of values for completing an activity as scheduled. The sum of costs for all activities must equal the total Contract Sum.
- C. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine the critical path of Project and when activities can be performed.

- D. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- E. Event: The starting or ending point of an activity.
- F. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Contractor, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- G. Resource Loading: The allocation of manpower and equipment necessary for completing an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. Working electronic copy of schedule file.
 - 2. PDF file.
- B. Startup construction schedule.
 - 1. Submittal of cost-loaded startup construction schedule will not constitute approval of schedule of values for cost-loaded activities.
- C. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- D. Contractor's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
 - 1. Submit a working digital copy of schedule, using software indicated, and labeled to comply with requirements for submittals.
- E. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, cost and resource loading, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for each activity, sorted in ascending order by activity number and then by early start date, or actual start date if known.
 - 3. Total Float Report: List of activities sorted in ascending order of total float.
- F. Construction Schedule Updating Reports: Submit with Applications for Payment.

- G. Daily Construction Reports: Submit at weekly intervals.
- H. Material Location Reports: Submit at weekly intervals.
- I. Site Condition Reports: Submit at time of discovery of differing conditions.
- J. Unusual Event Reports: Submit at time of unusual event.
- K. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Architect's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Division 01 Section "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Contractor's Construction Schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing work stages area separations and interim milestones.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review schedule for work of Owner's separate contracts.
 - 6. Review submittal requirements and procedures.
 - 7. Review time required for review of submittals and resubmittals.
 - 8. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 9. Review time required for Project closeout and Owner startup procedures.
 - 10. Review and finalize list of construction activities to be included in schedule.
 - 11. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Contractor's Construction Schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities, and schedule them in proper sequence.

1.7 CONTRACTOR'S CONSTRUCTION SCHEDULE

- A. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.

- B. Scheduling Consultant: Engage a consultant to provide planning, evaluation, and reporting, using CPM scheduling.
 - 1. In-House Option: Owner may waive requirement to retain a consultant if Contractor employs skilled personnel with experience in CPM scheduling and reporting techniques. Submit qualifications.
 - 2. Meetings: Scheduling consultant shall attend all meetings related to Project progress, alleged delays, and time impact.
- C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of Final Completion.
 - 1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. Activities: Treat each floor or separate area as a separate numbered activity for each main element of the Work. Comply with the following:
 - 1. Activity Duration: Define activities so no activity is longer than 20 days, unless specifically allowed by Architect.
 - 2. Temporary Facilities: Indicate start and completion dates for the following as applicable:
 - a. Securing of approvals and permits required for performance of the Work.
 - b. Temporary facilities.
 - c. Construction of mock-ups, prototypes and samples.
 - d. Owner interfaces and furnishing of items.
 - e. Interfaces with Separate Contracts.
 - f. Regulatory agency approvals.
 - g. Punch list.
 - 3. Procurement Activities: Include procurement process activities for the following long lead-time items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
 - 4. Submittal Review Time: Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Contractor's Construction Schedule with submittal schedule.
 - 5. Startup and Testing Time: Include no fewer than 15 days for startup and testing.
 - 6. Substantial Completion: Indicate completion in advance of date established for Substantial Completion and allow time for Architect's administrative procedures necessary for certification of Substantial Completion.
 - 7. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and Final Completion.
- E. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule and show how the sequence of the Work is affected.
 - 1. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Uninterruptible services.
 - c. Partial occupancy before Substantial Completion.
 - d. Use-of-premises restrictions.

- e. Provisions for future construction.
 - f. Seasonal variations.
 - g. Environmental control.
- 2. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
 - a. Subcontract awards.
 - b. Submittals.
 - c. Purchases.
 - d. Mockups.
 - e. Fabrication.
 - f. Sample testing.
 - g. Deliveries.
 - h. Installation.
 - i. Tests and inspections.
 - j. Adjusting.
 - k. Curing.
 - l. Building flush-out.
 - m. Startup and placement into final use and operation.
- F. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and Final Completion, and the following interim milestones:
 - 1. Temporary enclosure and space conditioning.
- G. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
 - 1. Unresolved issues.
 - 2. Unanswered Requests for Information.
 - 3. Rejected or unreturned submittals.
 - 4. Notations on returned submittals.
 - 5. Pending modifications affecting the Work and the Contract Time.
- H. Contractor's Construction Schedule Updating: At monthly intervals, update schedule to reflect actual construction progress and activities. Issue schedule one week before each regularly scheduled progress meeting.
 - 1. Revise schedule immediately after each meeting or other activity where revisions have been recognized or made. Issue updated schedule concurrently with the report of each such meeting.
 - 2. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations.
 - 3. As the Work progresses, indicate Final Completion percentage for each activity.
- I. Recovery Schedule: When periodic update indicates the Work is 14 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which recovery will be accomplished.

- J. Distribution: Distribute copies of approved schedule to Architect, Owner, separate contractors, testing and inspecting agencies, and other parties identified by Contractor with a need-to-know schedule responsibility.
 - 1. Post copies in Project meeting rooms and temporary field offices.
 - 2. When revisions are made, distribute updated schedules to the same parties and post in the same locations. Delete parties from distribution when they have completed their assigned portion of the Work and are no longer involved in performance of construction activities.

1.8 STARTUP CONSTRUCTION SCHEDULE

- A. Startup Network Diagram: Submit diagram within thirty (30) days after award of contract.
- B. Preparation: Indicate each significant construction activity separately. Identify first workday of each week with a continuous vertical line. Outline significant construction activities for first 90 days of construction. Include skeleton diagram for the remainder of the Work and a cash requirement prediction based on indicated activities.

1.9 CPM SCHEDULE REQUIREMENTS

- A. Prepare network diagrams using AON (activity-on-node) format.
- B. CPM Schedule: Prepare Contractor's Construction Schedule using a cost- and resource-loaded, time-scaled CPM network analysis diagram for the Work.
 - 1. Develop network diagram in sufficient time to submit CPM schedule, so it can be accepted for use no later than 60 days after date established for the Notice to Proceed.
 - a. Failure to include any work item required for performance of this Contract shall not excuse Contractor from completing all work within applicable completion dates.
 - 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 - 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 - 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule to coordinate with the Contract Time.
- C. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
 - 1. Activities: Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Preparation and processing of submittals.
 - b. Mobilization and demobilization.
 - c. Purchase of materials.
 - d. Delivery.

- e. Fabrication.
 - f. Utility interruptions.
 - g. Installation.
 - h. Work by Owner that may affect or be affected by Contractor's activities.
 - i. Testing and inspection.
 - j. Punch list and Final Completion.
 - k. Activities occurring following Final Completion.
2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
5. Cost- and Resource-Loading of CPM Schedule: Assign cost to construction activities on the CPM schedule. Do not assign costs to submittal activities. Obtain Architect's approval prior to assigning costs to fabrication and delivery activities. Assign costs under main subcontracts for testing, operation and maintenance manuals, punch list activities, Project record documents, and demonstration and training (if applicable), in the amount of 5 percent of the Contract Sum.
 - a. Each activity cost shall reflect an appropriate value subject to approval by Architect.
 - b. Total cost assigned to activities shall equal the total Contract Sum.
- D. Contract Modifications: For each proposed contract modification and concurrent with its submission, prepare a time-impact analysis using a network fragment to demonstrate the effect of the proposed change on the overall Project schedule.
- E. Initial Issue of Schedule: Prepare initial network diagram from a sorted activity list indicating straight "early start-total float." Identify critical activities. Prepare tabulated reports showing the following:
 1. Contractor or subcontractor and the Work or activity.
 2. Description of activity.
 3. Main events of activity.
 4. Immediate preceding and succeeding activities.
 5. Early and late start dates.
 6. Early and late finish dates.
 7. Activity duration in workdays.
 8. Total float or slack time.
 9. Average size of workforce.
 10. Dollar value of activity (coordinated with the schedule of values).
- F. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
 1. Identification of activities that have changed.
 2. Changes in early and late start dates.

3. Changes in early and late finish dates.
4. Changes in activity durations in workdays.
5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

G. Value Summaries: Prepare two cumulative value lists, sorted by finish dates.

1. In first list, tabulate activity number, early finish date, dollar value, and cumulative dollar value.
2. In second list, tabulate activity number, late finish date, dollar value, and cumulative dollar value.
3. In subsequent issues of both lists, substitute actual finish dates for activities completed as of list date.
4. Prepare list for ease of comparison with payment requests; coordinate timing with progress meetings.
 - a. In both value summary lists, tabulate "actual percent complete" and "cumulative value completed" with total at bottom.

1.10 REPORTS

A. Daily Construction Reports: Prepare a daily construction report recording the following information concerning events at Project site:

1. List of subcontractors at Project site.
2. List of separate contractors at Project site.
3. Approximate count of personnel at Project site.
4. Equipment at Project site.
5. Material deliveries.
6. High and low temperatures and general weather conditions, including presence of rain or snow.
7. Testing and inspection.
8. Accidents.
9. Meetings and significant decisions.
10. Unusual events.
11. Stoppages, delays, shortages, and losses.
12. Meter readings and similar recordings.
13. Emergency procedures.
14. Orders and requests of authorities having jurisdiction.
15. Change Orders received and implemented.
16. Construction Change Directives received and implemented.
17. Services connected and disconnected.
18. Equipment or system tests and startups.
19. Partial completions and occupancies.
20. Substantial Completions authorized.

B. Material Location Reports: At monthly intervals, prepare and submit a comprehensive list of materials delivered to and stored at Project site. List shall be cumulative, showing materials previously reported plus items recently delivered. Include with list a statement of progress on and delivery dates for materials or items of equipment fabricated or stored away from Project site. Indicate the following categories for stored materials:

1. Material stored prior to previous report and remaining in storage.
 2. Material stored prior to previous report and since removed from storage and installed.
 3. Material stored following previous report and remaining in storage.
- C. Site Condition Reports: Immediately on discovery of a difference between site conditions and the Contract Documents, prepare and submit a detailed report. Submit with a Request for Information. Include a detailed description of the differing conditions, together with recommendations for changing the Contract Documents.
- D. Unusual Event Reports: When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit a special report. List chain of events, persons participating, responses by Contractor's personnel, evaluation of results or effects, and similar pertinent information. Advise Owner in advance when these events are known or predictable.
1. Submit unusual event reports directly to Owner within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 00

SECTION 01 32 33 - PHOTOGRAPHIC DOCUMENTATION

PART 1 - GENERAL

1.1 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs.
 - 2. Periodic construction photographs.
 - 3. Final Completion construction photographs.
- B. Related Requirements:
 - 1. Section 017700 "Closeout Procedures" for submitting photographic documentation as Project Record Documents at Project closeout.
 - 2. Section 024119 "Selective Demolition" for photographic documentation before selective demolition operations commence.

1.2 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files within five (5) days of taking photographs.
 - 1. Submit photos on thumb drive. Include copy of key plan indicating each photograph's location and direction.
 - 2. Identification: Provide the following information with each image description in file metadata tag:
 - a. Name of Project.
 - b. Name and contact information for photographer.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Date photograph was taken.
 - f. Description of location, vantage point, and direction.
 - g. Unique sequential identifier keyed to accompanying key plan.

1.3 FORMATS AND MEDIA

- A. Digital Photographs: Provide color images in JPG format, produced by a digital camera with minimum sensor size of 12 megapixels. Use flash in low light levels or backlit conditions.
- B. Digital Images: Submit digital media as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

1.4 CONSTRUCTION PHOTOGRAPHS

- A. Photographer: Engage a qualified photographer to take construction photographs.
- B. General: Take photographs with maximum depth of field and in focus.
 - 1. Maintain key plan with each set of construction photographs that identifies each photographic location.
- C. Preconstruction Photographs: Before commencement of the Work, take photographs of Project structures and surrounding site, including existing items to remain during construction, from different vantage points.
 - 1. Flag construction limits before taking construction photographs.
 - 2. Take 20 photographs to show existing conditions before starting the Work to accurately record physical conditions at start of construction.
 - 3. Take additional photographs as required to record settlement or cracking of adjacent structures, pavements, and improvements.
- D. Concealed Work Photographs: Before proceeding with installing work that will conceal other work, take photographs sufficient in number, with annotated descriptions, to record nature and location of concealed Work, including, but not limited to, the following:
 - 1. Underground utilities.
 - 2. Underslab services.
 - 3. Piping.
 - 4. Electrical conduit.
 - 5. Waterproofing and weather-resistant barriers.
- E. Periodic Construction Photographs: Take 20 photographs weekly. Select vantage points to show status of construction and progress since last photographs were taken.
- F. Final Completion Construction Photographs: Take 50 photographs after date of Substantial Completion for submission as Project Record Documents.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 32 33

SECTION 01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control.
- B. Testing and inspection services are required to verify compliance with requirements specified or indicated. These services do not relieve Contractor of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and quality-control requirements for individual work results are specified in their respective Specification Sections. Requirements in individual Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Contractor's other quality-assurance and quality-control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Contractor to provide quality-assurance and quality-control services required by Architect, Owner, or authorities having jurisdiction are not limited by provisions of this Section.
- C. Related Requirements:
 - 1. Division 01 Section "Construction Progress Documentation" for developing a schedule of required tests and inspections.
 - 2. Division 01 Section "Mockups" for additional construction requirements for integrated exterior mockups.
 - 3. Division 01 Section "Execution" for Contract Document requirements for cutting and patching.
 - 4. Divisions 02 through 33 Sections for specific test and inspection requirements.

1.3 DEFINITIONS

- A. Experienced: When used with an entity or individual, "experienced," unless otherwise further described, means having successfully completed a minimum of five previous projects similar in nature, size, and extent to this Project; being familiar with special requirements indicated; and having complied with requirements of authorities having jurisdiction.

- B. Field Quality-Control Tests and Inspections: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- C. Installer/Applicator/Erector: Contractor or another entity engaged by Contractor as an employee, subcontractor, or sub-subcontractor, to perform a particular construction operation, including installation, erection, application, assembly, and similar operations.
 - 1. Use of trade-specific terminology in referring to a Work result does not require that certain construction activities specified apply exclusively to specific trade(s).
- D. Mockups: Physical assemblies of portions of the Work constructed to establish the standard by which the Work will be judged. Mockups are not Samples.
 - 1. Mockups are used for one or more of the following:
 - a. Verify selections made under Sample submittals.
 - b. Demonstrate aesthetic effects.
 - c. Demonstrate the qualities of products and workmanship.
 - d. Demonstrate successful installation of interfaces between components and systems.
 - e. Perform preconstruction testing to determine system performance.
 - 2. Product Mockups: Mockups that may include multiple products, materials, or systems specified in a single Section.
 - 3. In-Place Mockups: Mockups constructed on-site in their actual final location as part of permanent construction.
- E. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria. Unless otherwise indicated, copies of reports of tests or inspections performed for other than the Project do not meet this definition.
- F. Product Tests: Tests and inspections that are performed by a nationally recognized testing laboratory (NRTL) according to 29 CFR 1910.7, by a testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program (NVLAP), or by a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- G. Source Quality-Control Tests and Inspections: Tests and inspections that are performed at the source (e.g., plant, mill, factory, or shop).
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. The term "testing laboratory" has the same meaning as the term "testing agency."
- I. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work, to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- J. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work, to evaluate that actual products incorporated into the Work and completed construction comply with requirements. Contractor's quality-control services do not include contract administration activities performed by Architect.

1.4 DELEGATED DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Contractor by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
 - 1. If criteria indicated are not sufficient to perform services or certification required, submit a written request for additional information to Architect.
- B. Delegated Design Services Statement: Submit a statement signed and sealed by the responsible design professional, for each product and system specifically assigned to Contractor to be designed or certified by a design professional, indicating that the products and systems are in compliance with performance and design criteria indicated. Include list of codes, loads, and other factors used in performing these services.

1.5 CONFLICTING REQUIREMENTS

- A. Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements is specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, inform the Architect regarding the conflict and obtain clarification prior to proceeding with the Work. Refer conflicting requirements that are different, but apparently equal, to Architect for clarification before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified is the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Architect for a decision before proceeding.

1.6 ACTION SUBMITTALS

- A. Mockup Shop Drawings:
 - 1. Include plans, sections, elevations, and details, indicating materials and size of mockup construction.
 - 2. Indicate manufacturer and model number of individual components.
 - 3. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.7 INFORMATIONAL SUBMITTALS

- A. Contractor's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Contractor's quality-control personnel.
- C. Testing Agency Qualifications: For testing agencies specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include proof of qualifications in the form of a recent report on the inspection of the testing agency by a recognized authority.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:

1. Specification Section number and title.
2. Entity responsible for performing tests and inspections.
3. Description of test and inspection.
4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

- E. Reports: Prepare and submit certified written reports and documents as specified.
- F. Permits, Licenses, and Certificates: For Owner's record, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents established for compliance with standards and regulations bearing on performance of the Work.

1.8 CONTRACTOR'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: The Contractor will manage the Quality-Control Process through the Web-Based Project Management Software. Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Architect and Owner. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Contractor's quality-assurance and quality-control responsibilities and to coordinate Owner's quality-assurance and quality-control activities. Coordinate with Contractor's Construction Schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
1. Contractor-performed tests and inspections, including subcontractor-performed tests and inspections. Include required tests and inspections and Contractor-elected tests and inspections. Distinguish source quality-control tests and inspections from field quality-control tests and inspections.
 2. Special inspections required by authorities having jurisdiction and indicated on the Statement of Special Inspections.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring the Work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports, including log of approved and rejected results. Include Work Architect has indicated as nonconforming or defective. Indicate

corrective actions taken to bring nonconforming Work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.9 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
1. Date of issue.
 2. Project title and number.
 3. Name, address, telephone number, and email address of testing agency.
 4. Dates and locations of samples and tests or inspections.
 5. Names of individuals making tests and inspections.
 6. Description of the Work and test and inspection method.
 7. Identification of product and Specification Section.
 8. Complete test or inspection data.
 9. Test and inspection results and an interpretation of test results.
 10. Record of temperature and weather conditions at time of sample-taking and testing and inspection.
 11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
 12. Name and signature of laboratory inspector.
 13. Recommendations on retesting and reinspecting.
- B. Manufacturer's Technical Representative's Field Reports: Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of technical representative making report.
 2. Statement on condition of substrates and their acceptability for installation of product.
 3. Statement that products at Project site comply with requirements.
 4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
 5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 6. Statement of whether conditions, products, and installation will affect warranty.
 7. Other required items indicated in individual Specification Sections.
- C. Factory-Authorized Service Representative's Reports: Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:
1. Name, address, telephone number, and email address of factory-authorized service representative making report.
 2. Statement that equipment complies with requirements.
 3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
 4. Statement of whether conditions, products, and installation will affect warranty.
 5. Other required items indicated in individual Specification Sections.

1.10 QUALITY ASSURANCE

- A. Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.
- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units. As applicable, procure products from manufacturers able to meet qualification requirements, warranty requirements, and technical or factory-authorized service representative requirements.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, applying, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- F. Specialists: Certain Specification Sections require that specific construction activities be performed by entities who are recognized experts in those operations. Specialists will satisfy qualification requirements indicated and engage in the activities indicated.
 - 1. Requirements of authorities having jurisdiction supersede requirements for specialists.
- G. Testing and Inspecting Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspection indicated, as documented in accordance with ASTM E329, and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
- H. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect, demonstrate, repair, and perform service on installations of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- J. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following Contractor's responsibilities, including the following:
 - 1. Provide test specimens representative of proposed products and construction.
 - 2. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.

3. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
4. Build site-assembled test assemblies and mockups, using installers who will perform same tasks for Project.
5. When testing is complete, remove test specimens and test assemblies, and mockups; do not reuse products on Project.
6. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Architect, with copy to Contractor. Interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from the Contract Documents.

K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:

1. Build mockups of size indicated.
2. Build mockups in location indicated or, if not indicated, as directed by Architect.
3. Notify Architect seven days in advance of dates and times when mockups will be constructed.
4. Employ supervisory personnel who will oversee mockup construction. Employ workers who will be employed to perform same tasks during the construction at Project.
5. Demonstrate the proposed range of aesthetic effects and workmanship.
6. Obtain Architect's and Owner's approval of mockups before starting corresponding Work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
7. Promptly correct unsatisfactory conditions noted by Architect's preliminary review, to the satisfaction of the Architect, before completion of final mockup.
8. Approval of mockups by the Architect does not constitute approval of deviations from the Contract Documents contained in mockups unless Architect specifically approves such deviations in writing.
9. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
10. Demolish and remove mockups when directed unless otherwise indicated.

L. Specialty Mockups: See Division 01 "Mockups" for additional construction requirements for integrated exterior mockups.

1.11 QUALITY CONTROL

A. Contractor Responsibilities: Tests and inspections not explicitly assigned to Owner are Contractor's responsibility. Perform additional quality-control activities, whether specified or not, to verify and document that the Work complies with requirements.

1. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Contractor by authorities having jurisdiction, whether specified or not.
2. Engage a qualified testing agency to perform quality-control services.
3. Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed.

4. Where quality-control services are indicated as Contractor's responsibility, submit a certified written report, in duplicate, of each quality-control service.
 5. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.
 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.
- B. Retesting/Reinspecting: Regardless of whether original tests or inspections were Contractor's responsibility, provide quality-control services, including retesting and reinspecting, for construction that replaced Work that failed to comply with the Contract Documents.
- C. Testing Agency Responsibilities: Cooperate with Architect, and Contractor in performance of duties. Provide qualified personnel to perform required tests and inspections.
1. Notify Architect, and Contractor promptly of irregularities or deficiencies observed in the Work during performance of its services.
 2. Determine the locations from which test samples will be taken and in which in-situ tests are conducted.
 3. Conduct and interpret tests and inspections, and state in each report whether tested and inspected Work complies with or deviates from requirements.
 4. Submit a certified written report, in duplicate, of each test, inspection, and similar quality-control service through Contractor.
 5. Do not release, revoke, alter, or increase the Contract Document requirements or approve or accept any portion of the Work.
 6. Do not perform duties of Contractor.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 013300 "Submittal Procedures."
- E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. Contractor's Associated Requirements and Services: Cooperate with agencies and representatives performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspection. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspection equipment at Project site.

- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and quality-control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspection.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.
- H. Schedule of Tests and Inspections: Prepare a schedule of tests, inspections, and similar quality-control services required by the Contract Documents. Coordinate and submit concurrently with Contractor's Construction Schedule. Update and submit with each Application for Payment.
 - 1. Schedule Contents: Include tests, inspections, and quality-control services, including Contractor- and Owner-retained services, and other Project-required services paid for by other entities.
 - 2. Distribution: Distribute schedule to Owner, Architect, testing agencies, and each party involved in performance of portions of the Work where tests and inspections are required.

1.12 SPECIAL TESTS AND INSPECTIONS

- A. Special Tests and Inspections: Contractor shall engage a qualified testing agency to conduct special tests and inspections required by authorities having jurisdiction as the responsibility of Contractor, and as follows:
 - 1. Notifying Architect, and Contractor promptly of irregularities and deficiencies observed in the Work during performance of its services.
 - 2. Submitting a certified written report of each test, inspection, and similar quality-control service to Architect, with copy to Contractor and to authorities having jurisdiction.
 - 3. Submitting a final report of special tests and inspections at Substantial Completion, which includes a list of unresolved deficiencies.
 - 4. Interpreting tests and inspections, and stating in each report whether tested and inspected Work complies with or deviates from the Contract Documents.
 - 5. Retesting and reinspecting corrected Work.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Architect.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Architect's, and authorities' having jurisdiction reference during normal working hours.

1. Submit log at Project closeout as part of Project Record Documents.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspection, sample-taking, and similar services, repair damaged construction and restore substrates and finishes.
 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Division 01 Section "Execution."
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Contractor's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 01 40 00

SECTION 01 50 00 - TEMPORARY FACILITIES AND CONTROLS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. During Construction, the Contractor will utilize the Main Lobby of the Detention Center for their Field Office. Related items contained in this specification are to be coordinated and confirmed with the Owner.

1.3 USE CHARGES

- A. General: Cost or use charges for temporary facilities are not chargeable to the Owner or Architect unless specifically noted otherwise. The Owner will not accept a Contractor's cost or use charges for temporary services or facilities as a basis of claim for an adjustment in the Contract Sum or the Contract Time
 - 1. Installation, removal, and use charges for temporary facilities shall be included in the Contract Sum unless otherwise indicated. Allow other entities engaged in the Project to use temporary services and facilities without cost, including, but not limited to, Architect, testing agencies, and authorities having jurisdiction.
- B. Water Service: The Contractor will pay water service use charges for all metered water used by all entities engaged in construction activities at the Project Site.
- C. Electric Power Service: The Contractor will pay electric power service use charges for all metered electric power used by all entities engaged in construction activities at the Project Site.
- D. Fuel for Temporary Heat: As described in the Temporary Heat paragraph.

1.4 INFORMATIONAL SUBMITTALS

- A. Site Utilization Plan: Show temporary facilities, temporary utility lines and connections, staging areas, construction site entrances, vehicle circulation, and parking areas for construction personnel.

- B. Implementation and Termination Schedule: Within 15 days of date established for commencement of the Work, submit schedule indicating implementation and termination dates of each temporary utility.
- C. Noise and Vibration Control Plan: Identify construction activities that may impact the occupancy and use of existing spaces of adjacent existing buildings. Include the following:
 - 1. Methods used to meet the goals and requirements of the Owner.
 - 2. Concrete cutting method(s) to be used.
 - 3. Location of construction devices on the site.
 - 4. Show compliance with the use and maintenance of quieted construction devices for the duration of the Project.
 - 5. Indicate activities that may disturb adjacent building occupants and that are planned to be performed during non-standard working hours as coordinated with the Owner.
- D. Vibration Monitoring Surveys: Refer to Paragraph 3.6 for requirements of pre-demolition and post-demolition surveys.

1.5 QUALITY ASSURANCE

- A. Regulations: Contractor shall comply with industry standards and with applicable laws and regulations of authorities having jurisdiction including, but not limited to, the following:
 - 1. Building code requirements.
 - 2. Health and safety regulations.
 - 3. Utility company regulations.
 - 4. Police, fire department and rescue squad rules.
 - 5. Environmental protection regulations.
- B. Standards: Contractor shall comply with NFPA 241 "Standard for Safeguarding Construction, Alterations, and Demolition Operations," ANSI-A10 Series standards for "Safety Requirements for Construction and Demolition," and NECA Electrical Design Library "Temporary Electrical Facilities."
 - 1. Trade Jurisdictions: Assigned responsibilities for installation and operation of temporary utilities are not intended to interfere with the normal application of trade regulations and union jurisdictions.
 - 2. Electrical Service: Comply with NEMA, NECA and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- C. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Utilities: The Contractor shall prepare a schedule indicating dates for implementation and termination of each temporary utility for which the Contractor is responsible. At the earliest feasible time, when acceptable to the Owner, change over from use of temporary service to use of permanent service.

1. Temporary Use of Permanent Facilities: The Installer of each permanent service shall assume responsibility for its operation, maintenance, and protection during use as a construction facility prior to the Owner's acceptance, regardless of previously assigned responsibilities. The Contractor shall make permanent facilities available in accordance with the approved Project Schedule.
 2. Warranty Period: The Warranty Period for the entire project shall begin on the date of Substantial Completion regardless of the start-up date for use as a temporary or permanent facility, including but not limited to materials and equipment.
- B. Conditions of Use: Keep temporary services and facilities clean and neat in appearance. Operate in a safe and efficient manner. Relocate temporary services and facilities as the Work progresses. Do not overload facilities or permit them to interfere with progress. Take necessary fire-prevention measures. Do not allow hazardous, dangerous, or unsanitary conditions, or public nuisances to develop or persist on-site.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Lumber and Plywood: Comply with the requirements of Division 06 Section "Rough Carpentry."
- B. Tarpaulins: Provide waterproof, fire-resistant, UL-labeled tarpaulins with flame-spread rating of 15 or less. For temporary enclosures, provide translucent, nylon-reinforced, laminated polyethylene or polyvinyl chloride, fire-retardant tarpaulins.
- C. Temporary Fencing: By Contractor
- D. Dust-Control Adhesive-Surface Walk-Off Mats: Provide mats, minimum 36 by 60 inches.
- E. Filter media installed during construction and prior to occupancy: Minimum MERV 8 or F5 filter class.

2.2 EQUIPMENT

- A. Water Hoses: Provide 3/4-inch heavy-duty, abrasion-resistant, flexible rubber hoses 100 feet long, with pressure rating greater than the maximum pressure of the water distribution system. Provide adjustable shutoff nozzles at hose discharge.
- B. Electrical Outlets: Provide properly configured, NEMA-polarized outlets to prevent insertion of 110- to 120-V plugs into higher voltage outlets. Provide 120-V, single phase, receptacle outlets equipped with ground-fault circuit interrupters, reset button, and pilot light for connection of power tools and equipment.
- C. Electrical Power Cords: Provide grounded extension cords. Use hard-service cords where exposed to abrasion and traffic. Provide waterproof connectors to connect separate lengths of electric cords if single lengths will not reach areas where construction activities are in progress. Do not exceed safe length-voltage ratio.
- D. Lamps and Light Fixtures: Provide general service incandescent lamps of wattage required for adequate illumination. At a minimum, install weather-proof sockets complete with 100 watt lamps

at 20' on center in all corridor areas, circulation areas and all spaces over 400 square feet. Provide guard cages or tempered-glass enclosures, where exposed to breakage. Provide exterior fixtures where exposed to moisture.

- E. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
 - 1. Comply with NFPA 10 and NFPA 241 for classification, extinguishing agent, and size required by location and class of fire exposure.
- F. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline-burning space heaters, open-flame heaters, or salamander-type heating units is prohibited.
 - 2. Heating, Cooling, and Dehumidifying Units: Listed and labeled for type of fuel being consumed, by a qualified testing agency acceptable to authorities having jurisdiction, and marked for intended location and application.
 - 3. Permanent HVAC System: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter with minimum MERV 8 or F5 filter class at each return-air grille in system and remove at end of construction and clean HVAC system as required in Division 01 Section "Closeout Procedures."

2.3 TEMPORARY FACILITIES

- A. Field Offices: the Contractor will utilize the Main Lobby of the Detention Center for their Field Office.
- B. Temporary Toilet Units: Provide self-contained, single-occupant toilet units of the chemical, aerated recirculation, or combustion type. Provide units properly vented and fully enclosed with a glass-fiber-reinforced polyester shell or similar nonabsorbent material.

PART 3 - EXECUTION

3.1 TEMPORARY FACILITIES, GENERAL

- A. Conservation: Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.
 - 1. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property.

3.2 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.3 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Water Service: Install water service and distribution piping of sizes and pressures adequate for construction until permanent water service is in use.
 - 1. Sterilization: Sterilize temporary water piping prior to use.
- C. Temporary Electric Power Service: Provide weatherproof, grounded electric power service and distribution system of sufficient size, capacity, and power characteristics during construction period. Include meters, transformers, overload-protected disconnects, automatic ground-fault interrupters, and main distribution switch gear.
 - 1. Power Distribution System: Install wiring overhead and rise vertically where least exposed to damage. Where permitted, wiring circuits not exceeding 125 V, ac 20 ampere rating, and lighting circuits may be nonmetallic sheathed cable where overhead and exposed for surveillance.
- D. Temporary Lighting: When an overhead floor or roof deck has been installed, provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating the entire system.
- E. Temporary Heat: Provide temporary heat required by construction activities, for curing or drying of completed installations, or protection of installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce the ambient condition required and minimize consumption of energy.
 - 1. Provide temporary heat at varying stages of the Project to allow construction operations to proceed in an orderly, sequential manner. The following stages are milestones that must be clearly identified on the CPM Schedule as described in Division 1 Section "Construction Progress Documentation." The stages of the project are defined as follows:
 - a. Early Stage: The duration of the project from the start of construction to enclosure of the building. During this stage, the Contractor is responsible to provide temporary heat and any temporary enclosure to contain the heated air necessary for its own construction activities. The Contractor is responsible to furnish the equipment and fuel for their own temporary heating.
 - b. Intermediate Stage: The duration of the project from the time the building is wholly or partially enclosed as determined by the Architect but prior to the operation of the permanent HVAC equipment for construction heating. During this stage, the Contractor shall provide temporary heating to establish an ambient air temperature

in the building, or portion thereof, to maintain construction activities, including the provision of necessary equipment and fuel. An ambient air temperature of 50 degrees F must be capable of being maintained throughout the area of work receiving temporary heat.

- c. Final Stage: The duration of the project after building enclosure is attained and the permanent HVAC equipment is available to provide temporary heat and air conditioning as determined by the Architect. An ambient air temperature of 70 degrees F must be capable of being maintained uniformly. The Contractor is responsible to provide start-up, maintenance and operation of all permanent HVAC units and provide temporary automatic temperature control wiring and devices to properly regulate the permanent devices. The Contractor is responsible to have all permanent HVAC units that will provide temporary heat wired with their required power with service disconnects and all other NEC requirements. If power cannot be provided using the permanent electrical panel, wiring or distribution, then the Contractor must provide temporary means to meet the needs of the units. The Contractor is responsible to have all permanent gas-fired HVAC units that will be used to provide temporary heat, connected to a source for gas that will provide the necessary pressure and volume to operate the units as if they are in normal use, including compliance with applicable codes. If gas cannot be provided using the permanent gas system for the building, then the Contractor must provide temporary means to meet the needs of the units.
 2. Temporary heat shall be initiated and maintained to allow the performance of work for which a particular minimum ambient temperature must be maintained to meet the criteria described in individual sections of the technical specifications and as set forth by manufacturers recommendations.
 3. Temporary heat shall be provided to ensure that construction activities conform with the construction schedule and to the scheduling sequence established by the Contractor and as further directed by the Architect.
 4. The term "building enclosure" refers to a level of completion of the building, or a designated portion thereof that consists of the following:
 - a. Construction of roof structure, roof, insulation and roofing membrane.
 - b. Construction of back-up masonry or exterior metal studs with exterior sheathing.
 - c. Temporary enclosure of exterior wall openings. Refer to the "Temporary Enclosures" paragraph below for additional information.
 5. Provide temporary dehumidification systems when required to reduce ambient and substrate moisture levels to level required to allow installation or application of finishes and their proper curing or drying.
- F. Heating Facilities: Except where use of the permanent system is authorized, provide properly vented self-contained LP gas or fuel oil heaters with individual space thermostatic control.
1. Use of gasoline-burning space heaters, or open burning or salamander type heating units is prohibited.
- G. Sanitary Facilities: Provide temporary toilets, wash facilities, safety shower and eyewash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
1. Provide separate facilities for male and female personnel.

- H. Electronic Communication Service: Contractor to provide secure Wi-Fi wireless connection to internet with provisions for access by Architect and Owner only.

1. Subcontractors to provide own accommodations.

3.4 SUPPORT FACILITIES INSTALLATION

- A. Storage and Fabrication Facilities: Install storage and fabrication sheds or mobile trailers, sized, furnished and equipped to accommodate materials and equipment involved. Facilities may be open shelters or fully enclosed.
- B. Wash Facilities: Install wash facilities supplied with potable water at convenient locations for personnel involved in handling materials that require wash-up for a healthy and sanitary condition. Dispose of drainage properly. Supply cleaning compounds appropriate for each condition.
1. Provide safety showers, eye-wash fountains and similar facilities for convenience, safety and sanitation of personnel.
- C. Drinking Water Facilities: Provide containerized tap-dispenser bottled-water type drinking water units, including paper supply.
- D. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water, ice, and snow.
1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Remove snow and ice as required to minimize accumulations.
- E. Project Signs: Contractor to provide project signs.
- F. Waste Disposal Facilities: Comply with requirements specified in Division 01 Section "Construction and Demolition Waste Management and Disposal."
- G. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction. Comply with progress cleaning requirements in Division 01 Section "Execution."
- H. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.
- I. Temporary Elevator Use: See Division 14 elevator Section for temporary use of new elevators.
- J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- K. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.5 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.
- B. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
 - 1. Avoid using tools and equipment that produce harmful noise. Restrict use of noise-making tools and equipment to hours that will minimize complaints from persons or firms near the site.
- C. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion.
- E. Rodent and Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals, so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using materials approved by authorities having jurisdiction.
- F. Site Enclosure Fence: Contractor to provide site enclosure fence.
- G. Security Enclosure and Lockup: Install temporary enclosure around partially completed areas of construction. Provide lockable entrances to prevent unauthorized entrance, vandalism, theft, and similar violations of security. Lock entrances at end of each workday.
 - 1. Storage: Where materials and equipment must be stored, and are of value or attractive for theft, provide a secure lockup. Enforce discipline in connection with the installation and release of material to minimize the opportunity for theft and vandalism.
- H. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- I. Temporary Egress: Provide temporary egress from existing occupied facilities as indicated and as required by authorities having jurisdiction. Provide signage directing occupants to temporary egress.
- J. Covered Walkways: Contractor to provide covered walkways.

- K. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heat is needed and the permanent building enclosure is not complete, provide temporary insulated enclosures where there is no other provision for containment of heat. Coordinate enclosure with ventilating and material drying or curing requirements to avoid dangerous conditions and effects.
 - 2. Install tarpaulins securely, with incombustible wood framing and other materials. Close openings of 25 square feet or less with plywood or similar materials.
 - 3. Close openings through floor or roof decks and horizontal surfaces with load-bearing wood-framed construction.
- L. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas. Comply with additional limits on smoking specified in other Sections.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition in accordance with requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.

3.6 MOISTURE AND MOLD CONTROL

- A. Moisture and Mold Protection: Protect stored materials and installed Work in accordance with Moisture and Mold Protection Plan.
- B. Exposed Construction Period: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Period: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.
 - 6. Discard and replace stored or installed material that begins to grow mold.
 - 7. Perform work in a sequence that allows wet materials adequate time to dry before enclosing the material in gypsum board or other interior finishes.

- D. Controlled Construction Period: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:
1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
 2. Use temporary or permanent HVAC system to control humidity within ranges specified for installed and stored materials.
 3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction and remain wet for 48 hours are considered defective and require replacing.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Identify materials containing moisture levels higher than allowed. Report findings in writing to Architect.
 - c. Remove and replace materials that cannot be completely restored to their manufactured moisture level within 48 hours.

3.7 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Contractor. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.
 3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Division 01 Section "Closeout Procedures."

END OF SECTION 01 50 00

SECTION 01 60 00 - PRODUCT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for Contractor requirements related to Owner-furnished products.
 - 2. Division 01 Section "Substitution Procedures" for requests for substitutions.
 - 3. Division 01 Section "Closeout Procedures" for submitting warranties.

1.3 DEFINITIONS

- A. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Salvaged items or items reused from other projects are not considered new products. Items that are manufactured or fabricated to include recycled content materials are considered new products, unless indicated otherwise.
 - 3. Comparable Product: Product by named manufacturer that is demonstrated and approved through the comparable product submittal process described in Part 2 "Comparable Products" Article, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- B. Basis-of-Design Product Specification: A specification in which a single manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation. Published attributes and characteristics of basis-of-design product establish salient characteristics of products.

1. Evaluation of Comparable Products: In addition to the basis-of-design product description, product attributes and characteristics may be listed to establish the significant qualities related to type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other special features and requirements for purposes of evaluating comparable products of additional manufacturers named in the specification. Manufacturer's published attributes and characteristics of basis-of-design product also establish salient characteristics of products for purposes of evaluating comparable products.
- C. Subject to Compliance with Requirements: Where the phrase "Subject to compliance with requirements" introduces a product selection procedure in an individual Specification Section, provide products qualified under the specified product procedure. In the event that a named product or product by a named manufacturer does not meet the other requirements of the specifications, select another named product or product from another named manufacturer that does meet the requirements of the specifications; submit a comparable product request or substitution request, if applicable.
- D. Comparable Product Request Submittal: An action submittal requesting consideration of a comparable product, including the following information:
 1. Identification of basis-of-design product or fabrication or installation method to be replaced, including Specification Section number and title and Drawing numbers and titles.
 2. Data indicating compliance with the requirements specified in Part 2 "Comparable Products" Article.
- E. Basis-of-Design Product Specification Submittal: An action submittal complying with requirements in Division 01 Section "Submittal Procedures."
- F. Substitution: Refer to Division 01 Section "Substitution Procedures" for definition and limitations on substitutions.

1.4 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
- B. Identification of Products: Except for required labels and operating data, do not attach or imprint manufacturer or product names or trademarks on exposed surfaces of products or equipment that will be exposed to view in occupied spaces or on the exterior.
 1. Labels: Locate required product labels and stamps on a concealed surface, or, where required for observation following installation, on a visually accessible surface that is not conspicuous.
 2. Equipment Nameplates: Provide a permanent nameplate on each item of service- or power-operated equipment. Locate on a visually accessible but inconspicuous surface. Include information essential for operation, including the following:
 - a. Name of product and manufacturer.
 - b. Model and serial number.
 - c. Capacity.
 - d. Speed.
 - e. Ratings.

3. See individual identification Sections in Divisions 21, 22, 23, and 26 for additional equipment identification requirements.

1.5 COORDINATION

- A. Modify or adjust affected work as necessary to integrate work of approved comparable products and approved substitutions.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products, using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.
- B. Delivery and Handling:
 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
 4. Inspect products on delivery to determine compliance with the Contract Documents and that products are undamaged and properly protected.
- C. Storage:
 1. Provide a secure location and enclosure at Project site for storage of materials and equipment.
 2. Store products to allow for inspection and measurement of quantity or counting of units.
 3. Store materials in a manner that will not endanger Project structure.
 4. Store products that are subject to damage by the elements under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation and with adequate protection from wind.
 5. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 6. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 7. Protect stored products from damage and liquids from freezing.
 8. Provide a secure location and enclosure at Project site for storage of materials and equipment by Owner's construction forces. Coordinate location with Owner.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written standard warranty form furnished by individual manufacturer for a particular product and issued in the name of the Owner or endorsed by manufacturer to Owner.
 2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner and issued in the name of the Owner or endorsed by manufacturer to Owner.
- B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.
1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
 2. Specified Form: When specified forms are included in the Project Manual, prepare a written document, using indicated form properly executed.
 3. See other Sections for specific content requirements and particular requirements for submitting special warranties.
- C. Submittal Time: Comply with requirements in Division 01 Section "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 3. Owner reserves the right to limit selection to products with warranties meeting requirements of the Contract Documents.
 4. Where products are accompanied by the term "as selected," Architect will make selection.
 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 6. Or Equal: For products specified by name and accompanied by the term "or equal," "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
 - a. Submit additional documentation required by Architect in order to establish equivalency of proposed products. Unless otherwise indicated, evaluation of "or equal" product status is by the Architect, whose determination is final.
- B. Product Selection Procedures:
1. Sole Product: Where Specifications name a single manufacturer and product, provide the named product that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.

- a. Sole product may be indicated by the phrase "Subject to compliance with requirements, provide the following."
2. Sole Manufacturer/Source: Where Specifications name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Sole manufacturer/source may be indicated by the phrase "Subject to compliance with requirements, provide products by the following."
3. Limited List of Products: Where Specifications include a list of names of both manufacturers and products, provide one of the products listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of products may be indicated by the phrase "Subject to compliance with requirements, provide one of the following."
4. Non-Limited List of Products: Where Specifications include a list of names of both available manufacturers and products, provide one of the products listed or an unnamed product that complies with requirements.
 - a. Non-limited list of products is indicated by the phrase "Subject to compliance with requirements, available products that may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of an unnamed product is not considered a substitution, if the product complies with requirements.
5. Limited List of Manufacturers: Where Specifications include a list of manufacturers' names, provide a product by one of the manufacturers listed that complies with requirements. Comparable products or substitutions for Contractor's convenience will not be considered.
 - a. Limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, provide products by one of the following."
6. Non-Limited List of Manufacturers: Where Specifications include a list of available manufacturers, provide a product by one of the manufacturers listed or a product by an unnamed manufacturer that complies with requirements.
 - a. Non-limited list of manufacturers is indicated by the phrase "Subject to compliance with requirements, available manufacturers whose products may be incorporated in the Work include, but are not limited to, the following."
 - b. Provision of products of an unnamed manufacturer is not considered a substitution, if the product complies with requirements.
7. Basis-of-Design Product: Where Specifications name a product, or refer to a product indicated on Drawings, and include a list of manufacturers, provide the specified or indicated product or a comparable product by one of the other named manufacturers. Drawings and Specifications may additionally indicate sizes, profiles, dimensions, and other characteristics that are based on the product named. Comply with requirements in "Comparable Products" Article for consideration of an unnamed product by one of the other named manufacturers.

- a. For approval of products by unnamed manufacturers, comply with requirements in Division 01 Section "Substitution Procedures" for substitutions for convenience.
- C. Visual Matching Specification: Where Specifications require the phrase "match Architect's sample," provide a product that complies with requirements and matches Architect's sample. Architect's decision will be final on whether a proposed product matches.
 1. If no product available within specified category matches and complies with other specified requirements, comply with requirements in Division 01 Section "Substitution Procedures" for proposal of product.
- D. Visual Selection Specification: Where Specifications include the phrase "as selected by Architect from manufacturer's full range" or a similar phrase, select a product that complies with requirements. Architect will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration of Comparable Products: Architect will consider Contractor's request for comparable product when the following conditions are satisfied. If the following conditions are not satisfied, Architect may return requests without action, except to record noncompliance with the following requirements:
 1. Evidence that proposed product does not require revisions to the Contract Documents, is consistent with the Contract Documents, will produce the indicated results, and is compatible with other portions of the Work.
 2. Detailed comparison of significant qualities of proposed product with those of the named basis-of-design product. Significant product qualities include attributes, such as type, function, in-service performance and physical properties, weight, dimension, durability, visual characteristics, and other specific features and requirements.
 3. Evidence that proposed product provides specified warranty.
 4. List of similar installations for completed projects, with project names and addresses and names and addresses of architects and owners, if requested.
 5. Samples, if requested.
- B. Architect's Action on Comparable Products Submittal: If necessary, Architect will request additional information or documentation for evaluation, as specified in Division 01 Section "Submittal Procedures."
 1. Form of Approval of Submittal: As specified in Division 01 Section "Submittal Procedures."
 2. Use product specified if Architect does not issue a decision on use of a comparable product request within time allocated.
- C. Submittal Requirements, Single-Step Process: When acceptable to Architect, incorporate specified submittal requirements of individual Specification Section in combined submittal for comparable products. Approval by the Architect of Contractor's request for use of comparable product and of individual submittal requirements will also satisfy other submittal requirements.

BCDC LOBBY RENOVATION
BALTIMORE COUNTY, MARYLAND
JOB ORDER NUMBER – PROJ-10001187
CONTRACT NUMBER – 25122 PO0

PROJECT MANUAL
100% CONSTRUCTION DOCUMENTS
6-13-2025

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

SECTION 01 73 00 - EXECUTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work, including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner's portion of the Work.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Division 01 Section "Summary" for coordination of Owner-furnished products and limits on use of Project site.
 - 2. Division 01 Section "Submittal Procedures" for submitting surveys.
 - 3. Division 01 Section "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, replacing defective work, and final cleaning.
 - 4. Division 02 Section "Structure Demolition" for demolition and removal of the building.
 - 5. Division 07 Section "Penetration Firestopping" for patching penetrations in fire-rated construction.

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of subsequent work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of subsequent work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor and professional engineer.

- B. Certified Surveys: Submit (3) copies signed by land surveyor or professional engineer.
- C. Certificates: Submit certificate signed by land surveyor or professional engineer, certifying that location and elevation of improvements comply with requirements.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of the system, assembly, or product that is similar in material, design, and extent to those indicated for this Project.
- C. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements.
 - 1. Structural Elements: When cutting and patching structural elements, or when encountering the need for cutting and patching of elements whose structural function is not known, notify Architect of locations and details of cutting and await directions from Architect before proceeding. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection.
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Plumbing piping systems.
 - f. Mechanical systems piping and ducts.
 - g. Control systems.
 - h. Communication systems.
 - i. Fire-detection and -alarm systems.
 - j. Conveying systems.
 - k. Electrical wiring systems.
 - l. Operating systems of special construction.
 - 3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Sprayed fire-resistive material.
 - d. Equipment supports.
 - e. Piping, ductwork, vessels, and equipment.
 - f. Noise- and vibration-control elements and systems.

4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- D. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of specified products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Comply with requirements specified in other Sections.
 1. Use products for patching that comply with sustainable design requirements.
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Architect for the visual and functional performance of in-place materials. Use materials that are not considered hazardous.
- C. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work.
 1. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, gas service piping, and water-service piping; underground electrical services; and other utilities.
 2. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
 1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.

3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to local utility and Owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.
- D. Review of Contract Documents and Field Conditions: Immediately on discovery of the need for clarification of the Contract Documents, submit a request for information to Architect in accordance with requirements in Division 01 Section "Project Management and Coordination."

3.3 CONSTRUCTION LAYOUT

- A. Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks and existing conditions. If discrepancies are discovered, notify Architect promptly.
- B. Engage a land surveyor or professional engineer experienced in laying out the Work, using the following accepted surveying practices:
 1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Architect when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- C. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.

- D. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- E. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Architect.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
 - 1. Do not change or relocate existing benchmarks or control points without prior written approval of Architect. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Architect before proceeding.
 - 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain a minimum of two permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
 - 1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 - 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 - 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.
- C. Certified Survey: On completion of foundation walls, major site improvements, and other work requiring field-engineering services, prepare a certified survey showing dimensions, locations, angles, and elevations of construction and sitework.

3.5 INSTALLATION

- A. Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb, and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
 - 4. Maintain minimum headroom clearance of 96 inches in occupied spaces and 84 inches in unoccupied spaces, unless otherwise indicated on Drawings.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure satisfactory results as judged by Architect. Maintain conditions required for product performance until Substantial Completion.

- D. Conduct construction operations, so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy of type expected for Project.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on-site and placement in permanent locations.
- F. Tools and Equipment: Select tools or equipment that minimize production of excessive noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for Work specified to be factory prepared and field installed. Check Shop Drawings of other portions of the Work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions with manufacturer.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Architect.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed Work are not indicated, arrange joints for the best visual effect, as judged by Architect. Fit exposed connections together to form hairline joints.

3.6 CUTTING AND PATCHING

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
 - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of Work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to adjacent buildings.

- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.
- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as practicable, as judged by Architect. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch, corner to corner of wall and edge to edge of ceiling. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 PROGRESS CLEANING

- A. Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.

1. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 2. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F.
 3. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where Work is in progress to the level of cleanliness necessary for proper execution of the Work.
1. Remove liquid spills promptly.
 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in 017419 "Construction and Demolition Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.
- J. Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.8 STARTING AND ADJUSTING

- A. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- B. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- C. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

- D. Manufacturer's Field Service: Comply with qualification requirements in Section 014000 "Quality Requirements."

3.9 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.
- C. Comply with manufacturer's written instructions for temperature and relative humidity.

3.10 CORRECTION OF THE WORK

- A. Repair or remove and replace damaged, defective, or nonconforming Work. Restore damaged substrates and finishes.
 - 1. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment.
- B. Repair Work previously completed and subsequently damaged during construction period. Repair to like-new condition.
- C. Restore permanent facilities used during construction to their specified condition.
- D. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
- E. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired.
- F. Remove and replace chipped, scratched, and broken glass or reflective surfaces.

END OF SECTION 01 73 00

SECTION 01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Contract closeout, including, but not limited to, the following:
 - 1. Substantial Completion procedures.
 - 2. Final completion procedures.
 - 3. Warranties.
 - 4. Final cleaning.
- B. Related Requirements:
 - 1. Division 01 Section "Payment Procedures" for requirements for Applications for Payment for Substantial Completion and Final Completion.
 - 2. Division 01 Section "Photographic Documentation" for submitting Final Completion construction photographic documentation.
 - 3. Division 01 Section "Operation and Maintenance Data" for additional operation and maintenance manual requirements.
 - 4. Division 01 Section "Project Record Documents" for submitting Record Drawings, Record Specifications, and Record Product Data.
 - 5. Division 01 Section "Demonstration and Training" for requirements to train the Owner's maintenance personnel to adjust, operate, and maintain products, equipment, and systems.

1.3 DEFINITIONS

- A. List of Incomplete Items: Contractor-prepared list of items to be completed or corrected, prepared for the Architect's use prior to Architect's inspection, to determine if the Work is substantially complete.

1.4 ACTION SUBMITTALS

- A. Contractor's List of Incomplete Items: Initial submittal at Substantial Completion.

- B. Certified List of Incomplete Items: Final submittal at Final Completion.

1.5 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Certificate of Insurance: For continuing coverage.
- C. Field Report: For pest-control inspection.

1.6 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items required by other Sections.

1.7 SUBSTANTIAL COMPLETION PROCEDURES

- A. Contractor's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Contractor's "punch list"), indicating the value of each item on the list and reasons why the Work is incomplete.
- B. Submittals Prior to Substantial Completion: Complete the following a minimum of (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
 - 1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction, permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 2. Submit closeout submittals specified in other Division 01 Sections, including Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
 - 5. Submit testing, adjusting, and balancing records.
 - 6. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.

- C. Procedures Prior to Substantial Completion: Complete the following a minimum of (10) days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 6. Advise Owner of changeover in utility services.
 7. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 8. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 9. Complete final cleaning requirements.
 10. Touch up paint and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- D. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of (10) days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare the Certificate of Substantial Completion after inspection or will notify Contractor of items, either on Contractor's list or additional items identified by Architect, that must be completed or corrected before certificate will be issued.
1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Results of completed inspection will form the basis of requirements for Final Completion.

1.8 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining Final Completion, complete the following:
1. Submit a final Application for Payment in accordance with Division 01 Section "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Architect's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Architect. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Certificate of Insurance: Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Submit pest-control final inspection report.
 5. Submit Final Completion photographic documentation.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the Work will be completed and ready for final inspection and tests. On receipt of request, Architect will either proceed with inspection or notify Contractor of unfulfilled requirements. Architect will prepare a final Certificate for Payment after inspection or will notify Contractor of construction that must be completed or corrected before certificate will be issued.

1. Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.9 LIST OF INCOMPLETE ITEMS

- A. Organization of List: Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Contractor that are outside the limits of construction.
 1. Organize list of spaces in sequential order, starting with exterior areas first and proceeding from lowest floor to highest floor, listed by room or space number.
 2. Organize items applying to each space by major element, including categories for ceilings, individual walls, floors, equipment, and building systems.
 3. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Architect.
 - d. Name of Contractor.
 - e. Page number.

1.10 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Architect for designated portions of the Work where warranties are indicated to commence on dates other than date of Substantial Completion, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Partial Occupancy: Submit properly executed warranties within 15 days of completion of designated portions of the Work that are completed and occupied or used by Owner during construction period by separate agreement with Contractor.
- C. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
- D. Warranty Electronic File: Provide warranties and bonds in PDF format. Assemble complete warranty and bond submittal package into a single electronic PDF file with bookmarks enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
 1. Submit by uploading to web-based project software site.
- E. Provide additional copies of each warranty to include in operation and maintenance manuals.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37, or if GS-37 is not applicable, use products that comply with the California Code of Regulations maximum allowable VOC levels.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:
 - a. Clean Project site of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited-access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Clean flooring, removing debris, dirt, and staining; clean according to manufacturer's recommendations.
 - i. Vacuum and mop concrete.
 - j. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - k. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - l. Remove labels that are not permanent.

- m. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean ducts, blowers, and coils if units were operated during construction or that display contamination with particulate matter on inspection.
 - q. Clean luminaires, lamps, globes, and reflectors to function with full efficiency.
 - r. Clean strainers.
 - s. Leave Project clean and ready for occupancy.
- C. Pest Control: Comply with pest control requirements in Division 01 Section "Temporary Facilities and Controls." Prepare written report.
- D. Construction Waste Disposal: Comply with waste-disposal requirements in Division 01 Section "Construction and Demolition Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations required by Division 01 Section "Execution" before requesting inspection for determination of Substantial Completion.

END OF SECTION 01 77 00

SECTION 01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory manuals.
 - 2. Emergency manuals.
 - 3. Systems and equipment operation manuals.
 - 4. Systems and equipment maintenance manuals.
 - 5. Product maintenance manuals.
- B. Related Requirements:
 - 1. Division 01 Section "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.

1.3 CLOSEOUT SUBMITTALS

- A. Submit operation and maintenance manuals indicated. Provide content for each manual as specified in individual Specification Sections, and as reviewed and approved at the time of Section submittals. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operation and maintenance manuals in the following format:
 - 1. Submit as PDFs and by uploading to web-based project software site. Enable reviewer comments on draft submittals.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 30 days before commencing demonstration and training. Architect will comment on whether general scope and content of manual are acceptable.

- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 15 days before commencing demonstration and training. Architect will return copy with comments.
 - 1. Correct or revise each manual to comply with Architect's comments. Submit copies of each corrected manual within 15 days of receipt of comments and prior to commencing demonstration and training.
- E. Comply with Division 01 Section "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

1.4 FORMAT OF OPERATION AND MAINTENANCE MANUALS

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

- a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
- b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.

1.5 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization of Manuals: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 1. Title page.
 2. Table of contents.
 3. Manual contents.
- B. Title Page: Include the following information:
 1. Subject matter included in manual.
 2. Name and address of Project.
 3. Name and address of Owner.
 4. Date of submittal.
 5. Name and contact information for Contractor.
 6. Name and contact information for Architect.
 7. Names and contact information for major consultants to the Architect that designed the systems contained in the manuals.
 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

1.6 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY MANUAL

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

1.7 EMERGENCY MANUALS

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

1.8 SYSTEMS AND EQUIPMENT OPERATION MANUALS

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

- F. Piped Systems: Diagram piping as installed, and identify color coding where required for identification.

1.9 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Systems and Equipment Maintenance Manuals: Assemble a complete set of data indicating maintenance of each system, subsystem, and piece of equipment not part of a system. Include manufacturers' maintenance documentation, preventive maintenance procedures and frequency, repair procedures, wiring and systems diagrams, lists of spare parts, and warranty information.
 - 1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 - 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
- B. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranties and bonds as described below.
- C. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- D. Manufacturers' Maintenance Documentation: Include the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins; include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
 - a. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
 - 2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 - 3. Identification and nomenclature of parts and components.
 - 4. List of items recommended to be stocked as spare parts.
- E. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
 - 1. Test and inspection instructions.
 - 2. Troubleshooting guide.
 - 3. Precautions against improper maintenance.
 - 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - 5. Aligning, adjusting, and checking instructions.

6. Demonstration and training video recording, if available.
 - F. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
 1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
 - G. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
 - H. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
 - I. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 1. Include procedures to follow and required notifications for warranty claims.
 - J. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
 1. Do not use original project record documents as part of maintenance manuals.
- 1.10 PRODUCT MAINTENANCE MANUALS
- A. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
 - B. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
 - C. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
 - D. Product Information: Include the following, as applicable:
 1. Product name and model number.
 2. Manufacturer's name.
 3. Color, pattern, and texture.
 4. Material and chemical composition.
 5. Reordering information for specially manufactured products.

- E. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- F. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- G. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 23

SECTION 01 78 39 - PROJECT RECORD DOCUMENTS

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County's general provisions, terms, and conditions included in each bid package shall also apply to this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for Project Record Documents, including the following:
 - 1. Record Drawings.
 - 2. Record Samples.
 - 3. Miscellaneous record submittals.
- B. Related Requirements:
 - 1. Division 01 Section "Closeout Procedures" for general closeout procedures.
 - 2. Division 01 Section "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS

- A. Record Drawings: Comply with the following:
 - 1. Number of Copies: Submit copies of Record Drawings as follows:
 - a. Initial Submittal:
 - 1) Submit PDF electronic files of scanned record prints.
 - 2) Submit Record Digital Data Files.
 - 3) Architect will indicate whether general scope of changes, additional information recorded, and quality of drafting are acceptable.
 - b. Final Submittal:
 - 1) Submit (1) paper-copy set of marked-up record prints.
 - 2) Submit PDF electronic files of scanned record prints.
 - 3) Submit Record Digital Data Files.
 - 4) Print each drawing, whether or not changes and additional information were recorded.
- B. Record Samples: Immediately prior to date of Substantial Completion meet with the Architect and the Owner's personnel at the site to determine which of the Samples maintained during the construction period shall be transmitted to the Owner for record purposes. Comply with the

Architect's instructions for packaging, identification marking, and delivery to the Owner's Sample storage space. Dispose of other Samples in a manner specified for disposing surplus and waste materials.

1.4 RECORD DRAWINGS

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

1. Preparation: Mark record prints to show the actual installation, where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 - e. Cross-reference record prints to corresponding photographic documentation.
2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Changes made following Architect's written orders.
 - l. Details not on the original Contract Drawings.
 - m. Field records for variable and concealed conditions.
 - n. Record information on the Work that is shown only schematically.
3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.
4. Mark record prints with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
5. Mark important additional information that was either shown schematically or omitted from original Drawings.
6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.

B. Record Digital Data Files: Immediately before inspection for Certificate of Substantial Completion, review marked-up record prints with Architect. When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:

1. Format: Same digital data software program, version, and operating system as for the original Contract Drawings.

2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
 3. Refer instances of uncertainty to Architect for resolution.
- C. Format: Identify and date each Record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Format: Annotated PDF electronic file.
 3. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 4. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Architect.
 - e. Name of Contractor.

1.5 MISCELLANEOUS RECORD SUBMITTALS

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

1.6 MAINTENANCE OF RECORD DOCUMENTS

- A. Maintenance of Record Documents: Store Record Documents in the field office apart from the Contract Documents used for construction. Do not use Project Record Documents for construction purposes. Maintain Record Documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to Project Record Documents for Architect's reference during normal working hours.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 78 39

SECTION 02 41 19 - SELECTIVE DEMOLITION

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. Demolition and removal of selected portions of building.
- B. Related Requirements:
 - 1. Section 01 10 00 "Summary" for restrictions on the use of the premises, Owner-occupancy requirements, and phasing requirements.
 - 2. Section 01 73 00 "Execution" for cutting and patching procedures.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and legally dispose of them off-site unless indicated to be removed and salvaged or removed and reinstalled.
- B. Remove and Reinstall: Detach items from existing construction, prepare for reuse, and reinstall where indicated.
- C. Existing to Remain: Existing items of construction that are not to be permanently removed and that are not otherwise indicated to be removed, removed and salvaged, or removed and reinstalled. These items shall be preserved and protected in-place.

1.4 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 turn over to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Pre-demolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss the 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.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Proposed Protection Measures: Submit report, including drawings, that indicates the measures proposed for protecting individuals and property, for environmental protection, for dust control and, for noise control. Indicate proposed locations and construction of barriers.
- C. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations and activities are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
 - 5. If access to project-related spaces (Electrical or Mechanical Rooms, Etc.) outside of the project area is required, and/or Stair or Elevator use is needed, the Contractor will notify the Owner 48 hours in advance. Otherwise, the Contractor will not have use of the Elevator or Stairs during Construction.
- D. Inventory: Submit a list of items to be removed and salvaged and delivered to Owner prior to start of demolition.
- E. Pre-demolition Photographs or Video: Submit before Work begins.
- F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.
- G. Warranties: Documentation indicated that existing warranties are still in effect after completion of selective demolition.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.
- B. Landfill Records: Indicate receipt and acceptance of hazardous waste by a landfill facility licensed to accept hazardous wastes.

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 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, consult with Owner to identify items to be removed.
- 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.
- F. Storage or sale of removed items or materials on-site is not permitted.
- G. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 WARRANTY

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

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/ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review record documents of existing construction provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in record documents.
- C. Survey existing conditions and correlate with requirements indicated to determine extent of selective demolition required.
- D. When unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure the nature and extent of conflict. Promptly submit a written report to Architect.
- E. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
 - 2. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.
- F. Survey of Existing Conditions: Record existing conditions by use of preconstruction photographs and videotapes.
 - 1. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video of conditions that might be misconstrued as damage caused by salvage operations.
 - 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.
 - 1. Comply with requirements for existing services/systems interruptions specified in Section 01 10 00 "Summary."
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off indicated utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off indicated utilities with utility companies.
 - 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 to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - c. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - d. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

3.3 PREPARATION

- A. 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.
 - 1. Comply with requirements for access and protection specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Facilities: 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.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."

- C. Temporary Shoring: Provide and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
 - 1. Strengthen or add new supports when required during progress of selective demolition.

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, to minimize disturbance of adjacent surfaces. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 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 fire watch, if necessary, and portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain adequate ventilation when using cutting torches.
 - 6. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 7. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 8. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.
 - 9. Dispose of demolished items and materials promptly.
- B. 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 off-site.
 - 5. Protect items from damage during transport and storage.
- C. 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.
- D. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition.
- E. Moving Existing Furnishings: The Moving of existing furnishings should occur at each phase of work.
 1. It is responsibility of the Contractor to move existing furnishings out of the area to be selectively demolished before work is to begin. The Contractor is to survey the number of materials that will need to be packed and stored.
 2. Upon completion of the survey, the Contractor is to coordinate with the Architect and Owner PM for existing furnishings storage locations and space requirements while the work is being completed for that phase.
 3. The existing furnishings to be packed include Teacher's supplies (all remaining items after school personnel have moved out of the areas) excluding only computers (laptops, monitors, PC's) and personal effects.
 4. Provide all boxes required, packing materials, labels, etc. necessary to complete the move. Supply deliveries should be made prior to the start of construction. Packed boxes, furniture, and other furnishings should be removed from the spaces prior to the start of construction.
 5. All items to be stored onsite shall be secured and protected from dust, weather, and vandalism, among other things.
 6. It is the responsibility of The Contractor to return packed boxes, furniture and other furnishings upon completion of construction and cleaning of the area. Coordinate relocation efforts with the Owner PM.
- F. Moving Library/Media Center: The Moving of existing furnishings should occur at each phase of work.
 1. The contractor shall be responsible for packing, storing and unpacking Media Center materials. The contractor is required to hire an approved moving company with experience packing and moving library materials. The boxes must be stored in a conditioned storage location, possibly offsite, at the contractors' expense.

3.5 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, then remove concrete between saw cuts.
- B. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, then break up and remove.
- C. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
- D. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

3.6 DISPOSAL OF DEMOLISHED MATERIALS

- A. General: Except for items or materials indicated to be reused, salvaged, reinstalled, or otherwise indicated to remain Owner's property, remove demolished materials from Project site and legally dispose of them.
 - 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.
- C. Disposal: Transport demolished materials off Owner's property and legally dispose of them.

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 02 41 19

SECTION 04 20 00 - UNIT MASONRY ASSEMBLIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Concrete unit masonry.
 - a. Normal Weight Standard CMU.
 - 2. Mortar and grout.
 - 3. Masonry reinforcement and anchors.
 - 4. Masonry accessories

1.3 DEFINITIONS

- A. Reinforced Masonry: Masonry containing reinforcing steel in grouted cells.

1.4 SUBMITTALS

- A. Shop Drawings: For the following:
 - 1. Reinforcing Steel: Detail bending and placement of unit masonry reinforcing bars. Comply with ACI 315, "Details and Detailing of Concrete Reinforcement."
- B. Product data for each different masonry unit, accessory, and other manufactured product specified.
- C. Accessories embedded in masonry.
- D. Material Certificates: Include statements of material properties indicating compliance with requirements including compliance with standards and type designations within standards. Provide for each type and size of the following:
 - 1. Masonry units.
 - a. Include material test reports substantiating compliance with requirements.
 - b. For masonry units used in structural masonry, include data and calculations establishing average net-area compressive strength of units.
 - 2. Cementitious materials. Include brand, type, and name of manufacturer.
 - 3. Preblended, dry mortar mixes. Include description of type and proportions of ingredients.
 - 4. Grout mixes. Include description of type and proportions of ingredients.
 - 5. Reinforcing bars.
 - 6. Joint reinforcement.
 - 7. Anchors, ties, and metal accessories.
- E. Mix Designs: For each type of mortar and grout. Include description of type and proportions of ingredients.
 - 1. Include test reports, per ASTM C 780, for mortar mixes required to comply with

property specification.

- F. Statement of Compressive Strength of Masonry: For each combination of masonry unit type and mortar type, provide statement of average net area compressive strength of masonry units, mortar type, and resulting net-area compressive strength of masonry.
- G. Cold-Weather and Hot-Weather Procedures: Detailed description of methods, materials, and equipment to be used to comply with requirements.

1.5 QUALITY ASSURANCE

- A. Single-Source Responsibility for Masonry Units: Obtain exposed masonry units of a uniform texture and color, or a uniform blend within the ranges accepted for these characteristics, from one source and by a single manufacturer for each different product required.
- B. Single-Source Responsibility for Mortar Materials: Obtain mortar ingredients of a uniform quality, including color for exposed masonry, from one manufacturer for each cementitious component and from one source or producer for each aggregate.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store masonry units on elevated platforms, under cover, and in a dry location to prevent their deterioration or damage due to moisture, temperature changes, contaminants, corrosion, and other causes. If units become wet, do not install until they are in an air-dried condition.
- B. Store cementitious materials on elevated platforms, under cover, and in a dry location.
- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store masonry accessories, including metal items, to prevent corrosion and accumulation of dirt and oil.

1.7 PROJECT CONDITIONS

- A. Protection of Masonry: During erection, cover tops of walls, projections, and sills with waterproof sheeting at end of each day's work. Cover partially completed masonry when construction is not in progress.
 - 1. Extend cover a minimum of 24 inches (600 mm) down both sides and hold cover securely in place.
- B. Do not apply uniform floor or roof loads for at least 12 hours and concentrated loads for at least 3 days after building masonry walls or columns.
- C. Stain Prevention: Prevent grout, mortar, and soil from staining the face of masonry to be left exposed or painted. Immediately remove grout, mortar, and soil that come in contact with such masonry.
 - 1. Protect base of walls from rain-splashed mud and mortar splatter by coverings spread on ground and over wall surface.
 - 2. Protect sills, ledges, and projections from mortar droppings.
 - 3. Protect surfaces of window and door frames, as well as similar products with painted and integral finishes, from mortar droppings.
 - 4. Turn scaffold boards near the wall on edge at the end of each day to prevent rain from splashing mortar and dirt on completed masonry.

- D. Cold-Weather Requirements: Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen subgrade or setting beds. Remove and replace unit masonry damaged by frost or freezing conditions. Comply with the following requirements:
1. Cold-Weather Construction: When the ambient temperature is within the limits indicated, use the following procedures:
 - a. 40 to 32 deg F (4 to 0 deg C): Heat mixing water or sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C).
 - a. 32 to 25 deg F (0 to -4 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry.
 - b. 25 to 20 deg F (-4 to -7 deg C): Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C) if grouting. Use heat on both sides of walls under construction.
 - c. 20 deg F (-7 deg C) and Below: Heat mixing water and sand to produce mortar temperatures between 40 and 120 deg F (4 and 49 deg C). Heat grout materials to produce grout temperatures between 40 and 120 deg F (4 and 49 deg C). Maintain mortar and grout above freezing until used in masonry. Heat masonry units to 40 deg F (4 deg C). Provide enclosures and use heat on both sides of walls under construction to maintain temperatures above 32 deg F (0 deg C) within the enclosures.
 2. Cold-Weather Protection: When the mean daily temperature is within the limits indicated, provide the following protection:
 - a. 40 to 25 deg F (4 to -4 deg C): Cover masonry with a weather-resistant membrane for 48 hours after construction.
 - b. 25 to 20 deg F (-4 to -7 deg C): Cover masonry with insulating blankets or provide enclosure and heat for 48 hours after construction to prevent freezing. Install wind breaks when wind velocity exceeds 15 mi./h (25 km/h),
 - c. 20 deg F (-7 deg C) and Below: Provide enclosure and heat to maintain temperatures above 32 deg F (0 deg C) within the enclosure for 48 hours after construction.
 3. Cold-Weather Cleaning: Use liquid cleaning methods only when air temperature is 40 deg F (4 deg C) and above and will remain so until masonry has dried out, but not less than 7 days after completion of cleaning.
- E. Hot-Weather Requirements: Protect unit masonry work when temperature and humidity conditions produce excessive evaporation of water from mortar and grout. Provide artificial shade and wind breaks and use cooled materials as required. Do not apply mortar to substrates with temperatures of 100 deg F (38 deg C) and above.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Concrete Masonry Units:
 - a. Expanded Slag aggregate CMU by Maier Masonry Products.
 - b. Limestone or Solite aggregate CMU by Supreme.
 - c. Lightweight aggregate CMU by United Concrete Products.
 2. Portland Cement, Mortar Cement, Masonry Cement, and Lime:
 - a. Glen-Gery Corporation.
 - b. Lafarge Corporation.
 - c. Lehigh Portland Cement Co.
 - d. Riverton Corporation (The).
 3. Joint Reinforcement, Ties, and Anchors:
 - a. Dur-O-Wall, Inc.(Hohmann & Barnard, Inc.)
 - b. Heckman Building Products, Inc.
 - c. Hohmann & Barnard, Inc.

2.2 CONCRETE MASONRY UNITS

- A. General: Provide shapes indicated and as follows for each form of concrete masonry unit required.
1. Provide special shapes for lintels, corners, jambs, sash, control joints, headers, bonding, and other special conditions.
 2. Provide bullnose units for outside corners, unless otherwise indicated.
- B. Fire-Resistance Ratings: Where indicated, provide units that comply with requirements for fire-resistance ratings indicated as determined by testing according to ASTM E 119, by equivalent masonry thickness, or by other means, as acceptable to authorities having jurisdiction.
- C. Concrete Masonry Units: ASTM C 90 and as follows:
1. Unit Compressive Strength: Provide units with minimum average net-area compressive strength indicated below:
 - a. 2000 psi (13.8 MPa).
 - b. Not less than the unit compressive strengths required to produce concrete unit masonry construction of compressive strength indicated.
 2. Weight Classification: Normal weight.
 3. Aggregates: ASTM C33 and ASTM C331; Do not use aggregates made from pumice, scoria, or tuff. Cinder aggregates are not acceptable.
 4. Provide Type I, moisture-controlled units, high- or low-pressure steam cured.
 5. Size: Manufactured to the actual dimensions listed below (within tolerances specified in the applicable referenced ASTM specification) for the corresponding nominal sizes indicated on Drawings:
 - a. 12 inch nominal: 11 5/8" actual.
 - b. 8 inch nominal: 7-5/8 inch actual.
 - c. 6 inch nominal: 5 5/8" actual

6. Exposed Faces: Manufacturer's standard color and texture, unless otherwise indicated.
7. Exposed Corners: Rounded.

2.3 MORTAR AND GROUT MATERIALS

- A. Portland Cement: ASTM C 150, Type I or II, except Type III may be used for cold-weather construction.
- B. Masonry Cement: ASTM C 91.
 1. For pigmented mortars, use premixed, colored masonry cements of formulation required to produce color indicated, or if not indicated, as selected from manufacturer's standard formulations. Pigments shall not exceed 5 percent of masonry cement by weight for mineral oxides nor 1 percent for carbon black.
 2. For colored-aggregate mortars, use masonry cement of natural color or white as required to produce mortar color indicated.
- C. Hydrated Lime: ASTM C 207, Type S.
- D. Aggregate for Mortar: ASTM C 144; except for joints less than 1/4 inch (6.5 mm), use aggregate graded with 100 percent passing the No. 16 (1.18 mm) sieve.
- E. Aggregate for Grout: ASTM C 404.
- F. Ready-Mixed Mortar: Cementitious materials, water, and aggregate complying with requirements specified in this Article; combined with set controlling admixtures to produce a ready-mixed mortar complying with ASTM C 1142.
- G. Water: Potable
- H. Grout for Unit Masonry: Comply with ASTM C 476. Use grout of consistency that at time of placement will completely fill spaces intended to receive grout. Unless otherwise indicated, use grout of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height. Fill cores in hollow units with grout under bearing plates, beams, lintels, posts, and similar items.
 1. Aggregate for grout: ASTM C 404.

2.4 REINFORCING STEEL

- A. Steel Reinforcing Bars: Material and grade as follows:
 1. Billet Steel complying with ASTM A 615 (ASTM A 615M), Grade 60.
- B. Description: Welded-wire units prefabricated with deformed continuous side rods and plain cross rods into straight lengths of not less than 10 feet (3 m), with prefabricated corner and tee units, and complying with requirements indicated below:
 1. Wire Diameter for Side Rods: 0.1875 inch (4.8 mm).
 2. Wire Diameter for Cross Rods: 0.1875 inch (4.8 mm).
- C. For single-wythe masonry, provide type as follows with single pair of side rods:
 1. Truss design with continuous diagonal cross rods spaced not more than 16 inches (407 mm) o.c.

2.5 TIES AND ANCHORS, GENERAL

- A. General: Provide ties and anchors specified in subsequent articles that comply with requirements for metal and size of this Article, unless otherwise indicated.
- B. Wire: As follows:

1. Galvanized Carbon-Steel Wire: ASTM A 82; with ASTM A 153, Class B-2 coating.
2. Wire Diameter: 0.1875 inch (4.8 mm).

2.6 MISCELLANEOUS MASONRY ACCESSORIES

- A. Compressible Filler: Pre-molded filler strips complying with ASTM D 1056, Type 2, Class A, Grade 1; compressible up to 35 percent; of width and thickness indicated; formulated from the following material:
 1. Neoprene.
- B. Bond-Breaker Strips: Asphalt-saturated, organic roofing felt complying with ASTM D 226, Type I (No. 15 asphalt felt).

2.7. MASONRY CLEANERS

- A. Available Cleaning Products: Subject to compliance with requirements, and masonry manufacturers express product approval, a product that may be used to clean unit masonry surfaces includes, but is not limited to, the following:
 1. "Sure Klean No. 600 Detergent," ProSoCo, Inc.
 2. "Sure Klean No. 101 Lime Solvent," ProSoCo., Inc.
 3. "Sure Klean Vana Trol," ProSoCo, Inc.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of unit masonry. Do not proceed with installation until unsatisfactory conditions have been corrected.
- B. Examine rough-in and built-in construction to verify actual locations of piping connections prior to installation.

3.2 INSTALLATION, GENERAL

- A. Thickness: Build cavity and composite walls and other masonry construction to the full thickness shown. Build single-wythe walls to the actual thickness of the masonry units, using units of thickness indicated.
- B. Build chases and recesses to accommodate items specified in this and other Sections of the Specifications.
- C. Leave openings for equipment to be installed before completion of masonry. After installing equipment, complete masonry to match construction immediately adjacent to the opening.

- D. Mix units for exposed unit masonry from several pallets or cubes as they are placed to produce uniform blend of colors and textures.

3.3 CONSTRUCTION TOLERANCES

- A. Variation from Plumb: For vertical lines and surfaces of columns, walls, and arrises, do not exceed 1/4 inch in 10 feet (6 mm in 3 m), nor 3/8 inch in 20 feet (10 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For external corners, expansion joints, control joints, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For vertical alignment of head joints, do not exceed plus or minus 1/4 inch in 10 feet (6 mm in 3 m) , nor 1/2 inch (12 mm) maximum.
- B. Variation from Level: For bed joints and lines of exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines, do not exceed 1/4 inch in 20 feet (6 mm in 6 m), nor 1/2 inch in 40 feet (12 mm in 12 m) or more. For top surface of bearing walls, do not exceed 1/8 inch (3 mm) in 10 feet (3 m), nor 1/16 inch (1.5 mm) within width of a single unit.
- C. Variation of Linear Building Line: For position shown in plan and related portion of columns, walls, and partitions, do not exceed 1/2 inch in 20 feet (12 mm in 6 m), nor 3/4 inch in 40 feet (19 mm in 12 m) or more.
- D. Variation in Cross-Sectional Dimensions: For columns and thickness of walls, from dimensions shown, do not exceed minus 1/4 inch (6 mm) nor plus 1/2 inch (12 mm) .
- E. Variation in Mortar-Joint Thickness: Do not vary from bed-joint thickness indicated by more than plus or minus 1/8 inch (3 mm), with a maximum thickness limited to 1/2 inch (12 mm) . Do not vary bed-joint thickness from bed-joint thickness of adjacent course by more than 1/8 inch (3 mm). Do not vary from head-joint thickness indicated by more than plus or minus 1/8 inch (3 mm). Do not vary head-joint thickness from adjacent headjoint thickness by more than 1/8 inch (3 mm). Do not vary from collar-joint thickness indicated by more than minus 1/4 inch (6 mm) or plus 3/8 inch (10 mm).

3.4 LAYING MASONRY WALLS

- A. Lay out walls in advance for accurate spacing of surface bond patterns with uniform joint widths and for accurate locating of openings, movement type joints, returns, and offsets. Avoid the use of less-than-half-size units at corners, jambs, and where possible at other locations.
- B. Lay walls to comply with specified construction tolerances, with courses accurately spaced and coordinated with other construction.
- C. Bond Pattern for Exposed Masonry: Lay exposed masonry in the following bond pattern; do

not use units with less than nominal 4-inch (100-mm) horizontal face dimensions at corners or jambs.

- F. Stopping and Resuming Work: In each course, rack back 1/2-unit length for one-half running bond or 1/3-unit length for one-third running bond; do not tooth. Clean exposed surfaces of set masonry, wet clay masonry units lightly if required, and remove loose masonry units and mortar prior to laying fresh masonry.
- G. Built-in Work: As construction progresses, build-in items specified under this and other Sections of the Specifications. Fill in solidly with masonry around built-in items.
- H. Fill space between hollow metal frames and masonry solidly with mortar, unless otherwise indicated.
 - 1. At exterior frames, insert extruded polystyrene board insulation around perimeter of frame in thickness indicated, but not less than 3/4 inch (19 mm) to act as a thermal break between frame and masonry.
- I. Where built-in items are to be embedded in cores of hollow masonry units, place a layer of metal lath in the joint below and rod mortar or grout into core.
- J. Fill cores in hollow concrete masonry units with grout 24 inches (600 mm) under bearing plates, beams, lintels, posts, and similar items, unless otherwise indicated.
- K. Build non-load bearing interior partitions full height of story to underside of solid floor or roof structure above and as follows:
 - I. Install compressible filler in joint between top of partition and underside of structure above.

3.5. MORTAR BEDDING AND JOINTING

- A. Lay hollow concrete masonry units as follows:
 - 1. With full mortar coverage on horizontal and vertical face shells.
 - 2. Bed webs in mortar in starting course on footings and in all courses of piers, columns, and pilasters, and where adjacent to cells or cavities to be filled with grout.
 - 3. For starting course on footings where cells are not grouted, spread out full mortar bed, including areas under cells.
 - 4. Maintain joint widths indicated, except for minor variations required to maintain bond alignment. If not indicated, lay walls with 3/8-inch (10-mm) joints.
- B. Lay solid brick-size masonry units with completely filled bed and head joints; butter ends with sufficient mortar to fill head joints and shove into place. Do not furrow bed joints or slush head joints.

1. At cavity walls, slope beds toward cavity to minimize mortar protrusions into cavity. As work progresses, trowel mortar fins protruding into cavity flat against cavity face of brick.

- C. Tool exposed joints slightly concave when thumbprint hard, using a jointer larger than joint thickness, unless otherwise indicated.

3.7 CAVITIES

- A. Keep cavities clean of mortar droppings and other materials during construction. Strike joints facing cavities flush.

1. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.

- B. Tie exterior wythe to back-up with specified anchors to horizontal-joint reinforcing.

3.8 HORIZONTAL-JOINT REINFORCEMENT

- A. General: Provide continuous horizontal-joint reinforcement as indicated. Install entire length of longitudinal side rods in mortar with a minimum cover of 5/8 inch (16 mm) on exterior side of walls, 1/2 inch (13 mm) elsewhere. Lap reinforcing a minimum of 6 inches (150 mm).

1. Space reinforcement not more than 16 inches (406 mm) o.c.
2. Space reinforcement not more than 8 inches (203 mm) o.c. in foundation walls and parapet walls.
3. Provide reinforcement in mortar joint 1 block course above and below wall openings and extending 12 inches (305 mm) beyond opening.

- a. Reinforcement above is in addition to continuous reinforcement.

- B. Cut or interrupt joint reinforcement at control and expansion joints, unless otherwise indicated.

- C. Provide continuity at corners and wall intersections by using prefabricated "L" and "T" sections. Cut and bend reinforcement units as directed by manufacturer for continuity at returns, offsets, column fireproofing, pipe enclosures, and other special conditions.

3.9 CONTROL AND EXPANSION JOINTS

- A. General: Install control and expansion joints in unit masonry. Build-in related items as the masonry progresses. Do not form a continuous span through movement joints unless provisions are made to prevent in-plane restraint of wall or partition movement.

- B. Form control joints in concrete masonry as follows:

1. Fit bond-breaker strips into hollow contour in ends of block units on one side of control joint. Fill the resultant core with grout and rake joints in exposed faces.

C. Form expansion joints in brick made from clay or shale as follows:

1. Form open joint of width indicated, but not less than 3/8 inch (10 mm) for installation of sealant and backer rod specified in Division 7 Section "Joint Sealants." Maintain joint free and clear of mortar.

D. Build-in horizontal pressure-relieving joints where indicated; construct joints by either leaving an air space or inserting a compressible filler of width required for installing sealant and backer rod specified in Division 7 Section "Joint Sealants."

1. Locate horizontal pressure-relieving joints beneath shelf angles supporting masonry veneer and attached to structure behind masonry veneer.

3.10 LINTELS

A. Install steel lintels where indicated.

B. Provide masonry lintels where steel lintels are not indicated and where openings of more than 12 inches (305 mm) for brick size units and 24 inches (610 mm) for block size units are shown without structural steel or other supporting lintels.

1. Provide precast lintels made from concrete matching concrete masonry units in texture, and compressive strength and with reinforcement bars indicated or required to support loads indicated. Cure precast lintels by same method as CMU.

C. Provide minimum bearing of 8 inches (200 mm) at each jamb, unless otherwise indicated.

3.11 REINFORCED UNIT MASONRY INSTALLATION

A. Placing Reinforcement: Comply with requirements in [ACI 530.1/ASCE 6/TMS 602] [Section 2104.5 in the Uniform Building Code].

B. Grouting: Do not place grout until entire height of masonry to be grouted has attained enough strength to resist grout pressure.

1. Comply with requirements in ACI 530.1/ASCE 6 /TMS 602 for clean-outs and for grout placement, including minimum grout space and maximum pour height.
2. Limit height of vertical grout pours to not more than 60 inches (1520 mm).

3.15 FIELD QUALITY CONTROL

A. Testing Agency: Contractor will engage and pay for a qualified independent testing and inspecting agency to perform field tests and inspections indicated below and prepare test reports:

1. Clay Masonry Unit Test: provided, per ASTM C 67. For each type of unit
2. Concrete Masonry Unit Test: For each type of unit provided, per ASTM C 140.

3. Prism Test: For each type of construction provided, per ASTM C 1314.

3.17 REPAIRING, POINTING, AND CLEANING

- A. Remove and replace masonry units that are loose, chipped, broken, stained, or otherwise damaged or if units do not match adjoining units. Install new units to match adjoining units; install in fresh mortar or grout, pointed to eliminate evidence of replacement.
- B. Pointing: During the tooling of joints, enlarge voids and holes, except weep holes, and completely fill with mortar. Point-up joints, including corners, openings, and adjacent construction, to provide a neat, uniform appearance. Prepare joints for application of sealants.
- C. In-Progress Cleaning: Clean unit masonry as work progresses by dry brushing to remove mortar fins and smears prior to tooling joints.
- D. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry as follows:
 - 1. Remove large mortar particles by hand with wooden paddles and nonmetallic scrape hoes or chisels.
 - 2. Test cleaning methods on sample wall panel; leave one-half of panel uncleaned for comparison purposes. Obtain Architect's approval of sample cleaning before proceeding with cleaning of masonry.
 - 3. Protect adjacent stone and non-masonry surfaces from contact with cleaner by covering them with liquid strippable masking agent, polyethylene film, or waterproof masking tape.
 - 4. Wet wall surfaces with water prior to application of cleaners; remove cleaners promptly by rinsing thoroughly with clear water.
 - 5. Clean brick by bucket and brush hand-cleaning method described in BIA Technical Note No. 20 Revised, using the following masonry cleaner:
 - 6. Clean concrete masonry by cleaning method indicated in NCMA TEK 8-2 applicable to type of stain present on exposed surfaces.
 - 7. Apply acrylic coating to exterior ground-face concrete masonry in strict accordance with manufacturer's recommendations.
- E. Protection: Provide final protection and maintain conditions that ensure unit masonry is without damage and deterioration at time of Substantial Completion.

END OF SECTION 04 20 00

SECTION 06 10 00 - ROUGH CARPENTRY

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Framing with dimension lumber.
2. Treated and un-treated wood blocking, cants and nailers for interior applications.
3. Fire-retardant treated wood framing and blocking
4. Wood furring and grounds.

1.2 DEFINITIONS

- A. Exposed Framing: Framing not concealed by other construction.
- B. Dimension Lumber: Lumber of 2 inches nominal (38 mm actual) or greater but less than 5 inches nominal (114 mm actual) in least dimension.
- C. Timber: Lumber of 5 inches nominal (114 mm actual) or greater in least dimension.
- D. Lumber grading agencies, and the abbreviations used to reference them, include the following:
1. NeLMA: Northeastern Lumber Manufacturers' Association.
 2. NLGA: National Lumber Grades Authority.
 3. RIS: Redwood Inspection Service.
 4. SPIB: The Southern Pine Inspection Bureau.
 5. WCLIB: West Coast Lumber Inspection Bureau.
 6. WWPA: Western Wood Products Association.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of process and factory-fabricated product. Indicate component materials and dimensions and include construction and application details.
1. Include data for wood-preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Indicate type of preservative used and net amount of preservative retained.
 2. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements. Include physical properties of treated materials based on testing by a qualified independent testing agency.
 3. For fire-retardant treatments, include physical properties of treated lumber both before and after exposure to elevated temperatures, based on testing by a qualified independent testing agency according to ASTM D 5664.
 4. For products receiving a waterborne treatment, include statement that moisture content of treated materials was reduced to levels specified before shipment to Project site.

5. Include copies of warranties from chemical treatment manufacturers for each type of treatment.

- B. Fastener Patterns: Full-size templates for fasteners in exposed framing.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For dimension lumber specified to comply with minimum allowable unit stresses. Indicate species and grade selected for each use and design values approved by the ALSC Board of Review.
- B. Evaluation Reports: For the following, from ICC-ES:
 1. Wood-preservative-treated wood.
 2. Fire-retardant-treated wood.
 3. Engineered wood products.
 4. Power-driven fasteners.
 5. Powder-actuated fasteners.
 6. Expansion anchors.
 7. Metal framing anchors.

1.5 QUALITY ASSURANCE

- A. Testing Agency Qualifications: For testing agency providing classification marking for fire-retardant treated material, an inspection agency acceptable to authorities having jurisdiction that periodically performs inspections to verify that the material bearing the classification marking is representative of the material tested.
- B. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Stack lumber flat with spacers beneath and between each bundle to provide air circulation. Protect lumber from weather by covering with waterproof sheeting, securely anchored. Provide for air circulation around stacks and under coverings.

PART 2 - PRODUCTS

2.1 WOOD PRODUCTS, GENERAL

- A. Certified Wood: Materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
- B. Composite wood installed within the building interior: Comply with low-emitting requirements of CARB, NAF or applicable standard in Section 01 81 13.

- C. Lumber: DOC PS 20 and applicable rules of grading agencies indicated. If no grading agency is indicated, provide lumber that complies with the applicable rules of any rules-writing agency certified by the ALSC Board of Review. Provide lumber graded by an agency certified by the ALSC Board of Review to inspect and grade lumber under the rules indicated.
 - 1. Factory mark each piece of lumber with grade stamp of grading agency.
 - 2. For exposed lumber indicated to receive a stained or natural finish, mark grade stamp on end or back of each piece or omit grade stamp and provide certificates of grade compliance issued by grading agency.
 - 3. Where nominal sizes are indicated, provide actual sizes required by DOC PS 20 for moisture content specified. Where actual sizes are indicated, they are minimum dressed sizes for dry lumber.
 - 4. Provide dressed lumber, S4S, unless otherwise indicated.
- D. Maximum Moisture Content of Lumber: 19 percent unless otherwise indicated.
- E. Engineered Wood Products: Provide engineered wood products acceptable to authorities having jurisdiction and for which current model code research or evaluation reports exist that show compliance with building code in effect for Project.
 - 1. Allowable Design Stresses: Provide engineered wood products with allowable design stresses, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.

2.2 WOOD-PRESERVATIVE-TREATED LUMBER

- A. Preservative Treatment by Pressure Process: AWPAC U1; Use Category UC2 for interior construction not in contact with the ground, Use Category UC3b for exterior construction not in contact with the ground, and Use Category UC4a for items in contact with the ground.
 - 1. Preservative Chemicals: Acceptable to authorities having jurisdiction and containing no arsenic or chromium.
 - 2. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not require incising, contain colorants, bleed through, or otherwise adversely affect finishes.
- B. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Do not use material that is warped or that does not comply with requirements for untreated material.
- C. Mark lumber with treatment quality mark of an inspection agency approved by the ALSC Board of Review.
- D. Application: Treat items indicated on Drawings, and the following:
 - 1. Wood cants, nailers, curbs, equipment support bases, blocking, stripping, and similar members in connection with roofing, flashing, vapor barriers, and waterproofing.
 - 2. Wood sills, sleepers, blocking, furring, stripping, and similar concealed members in contact with masonry or concrete.

3. Wood framing and furring attached directly to the interior of below-grade exterior masonry or concrete walls.
 4. Wood framing members that are less than 18 inches (460 mm) above the ground in crawlspaces or unexcavated areas.
 5. Wood floor plates that are installed over concrete slabs-on-grade.
 6. Plywood backing panels.
- E. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.

2.3 FIRE-RETARDANT-TREATED MATERIALS

- A. General: Where fire-retardant-treated materials are indicated or required, use materials complying with requirements in this article, that are acceptable to authorities having jurisdiction, and with fire-test-response characteristics specified as determined by testing identical products per test method indicated by a qualified testing agency.
- B. Fire-Retardant-Treated Lumber and Plywood by Pressure Process: Products with a flame spread index of 25 or less when tested according to ASTM E 84, and with no evidence of significant progressive combustion when the test is extended an additional 20 minutes, and with the flame front not extending more than 10.5 feet (3.2 m) beyond the centerline of the burners at any time during the test.
1. Use treatment that does not promote corrosion of metal fasteners.
 2. Exterior Type: Treated materials shall comply with requirements specified above for fire-retardant-treated lumber and plywood by pressure process after being subjected to accelerated weathering according to ASTM D 2898. Use for exterior locations and where indicated.
 3. Interior Type A: Treated materials shall have a moisture content of 28 percent or less when tested according to ASTM D 3201 at 92 percent relative humidity. Use where exterior type is not indicated.
 4. Design Value Adjustment Factors: Treated lumber shall be tested according ASTM D 5664 and design value adjustment factors shall be calculated according to ASTM D 6841.
- C. Kiln-dry lumber after treatment to a maximum moisture content of 19 percent. Kiln-dry plywood after treatment to a maximum moisture content of 15 percent.
- D. Identify fire-retardant-treated wood with appropriate classification marking of qualified testing agency.
1. For exposed lumber indicated to receive a stained or natural finish, mark end or back of each piece or omit marking and provide certificates of treatment compliance issued by testing agency.
- E. For exposed items indicated to receive a stained or natural finish, use chemical formulations that do not bleed through, contain colorants, or otherwise adversely affect finishes.

2.4 DIMENSION LUMBER FRAMING

- A. Non-Load-Bearing Interior Partitions: Construction or No. 2 grade.

1. Application: Interior partitions not indicated as load-bearing.
2. Species:
 - a. Hem-fir (north); NLGA.
 - b. Spruce-pine-fir; NLGA.
 - c. Hem-fir; WCLIB, or WWP.
 - d. Spruce-pine-fir (south); NLGA, WCLIB, or WWP.

B. Load-Bearing Partitions: No. 2 grade.

1. Application: Exterior walls and interior load-bearing partitions.
2. Species:
 - a. Spruce-pine-fir; NLGA.

C. Joists, Rafters, and Other Framing Not Listed Above: No. 2 grade.

1. Species:
 - a. Spruce-pine-fir; NLGA.

D. Exposed Framing: Provide material hand-selected for uniformity of appearance and freedom from characteristics, on exposed surfaces and edges, that would impair finish appearance, including decay, honeycomb, knot-holes, shake, splits, torn grain, and wane.

1. Application: Exposed exterior and interior framing.
2. Species and Grade: Douglas fir-larch; No. 1 grade.

2.5 MISCELLANEOUS LUMBER

A. General: Provide miscellaneous lumber indicated and lumber for support or attachment of other construction, including the following:

1. Blocking.
2. Nailers.
3. Rooftop equipment bases and support curbs.
4. Cants.
5. Furring.
6. Grounds.
7. Utility shelving.

B. For items of dimension lumber size, provide Standard, Stud, or No. 3 grade lumber of any species.

C. For blocking not used for attachment of other construction, Utility, Stud, or No. 3 grade lumber of any species may be used provided that it is cut and selected to eliminate defects that will interfere with its attachment and purpose.

D. For blocking and nailers used for attachment of other construction, select and cut lumber to eliminate knots and other defects that will interfere with attachment of other work.

E. For furring strips for installing plywood or hardboard paneling, select boards with no knots capable of producing bent-over nails and damage to paneling.

2.6 FASTENERS

- A. General: Provide fasteners of size and type indicated that comply with requirements specified in this article for material and manufacture.
 - 1. Where rough carpentry is exposed to weather, in ground contact, pressure-preservative treated, or in area of high relative humidity, provide fasteners with hot-dip zinc coating complying with ASTM A 153/A 153M.
- B. Nails, Brads, and Staples: ASTM F 1667.
- C. Power-Driven Fasteners: NES NER-272.
- D. Wood Screws: ASME B18.6.1.
- E. Lag Bolts: ASME B18.2.1 (ASME B18.2.3.8M).
- F. Bolts: Steel bolts complying with ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6); with ASTM A 563 (ASTM A 563M) hex nuts and, where indicated, flat washers.
- G. Expansion Anchors: Anchor bolt and sleeve assembly of material indicated below with capability to sustain, without failure, a load equal to six times the load imposed when installed in unit masonry assemblies and equal to four times the load imposed when installed in concrete as determined by testing per ASTM E 488 conducted by a qualified independent testing and inspecting agency.
 - 1. Material: Carbon-steel components, zinc plated to comply with ASTM B 633, Class Fe/Zn 5.
 - 2. Material: Stainless steel with bolts and nuts complying with ASTM F 593 and ASTM F 594, Alloy Group 1 or 2 (ASTM F 738M and ASTM F 836M, Grade A1 or A4).

2.7 METAL FRAMING ANCHORS

- A. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:
 - 1. Cleveland Steel Specialty Co.
 - 2. KC Metals Products, Inc.
 - 3. Phoenix Metal Products, Inc.
 - 4. Simpson Strong-Tie Co., Inc.
 - 5. USP Structural Connectors.
- B. Allowable Design Loads: Provide products with allowable design loads, as published by manufacturer, that meet or exceed those indicated. Manufacturer's published values shall be determined from empirical data or by rational engineering analysis and demonstrated by comprehensive testing performed by a qualified independent testing agency.
- C. Galvanized-Steel Sheet: Hot-dip, zinc-coated steel sheet complying with ASTM A 653/A 653M, G60 (Z180) coating designation.
 - 1. Use for interior locations unless otherwise indicated.

- D. Hot-Dip, Heavy-Galvanized Steel Sheet: ASTM A 653/A 653M; structural steel (SS), high-strength low-alloy steel Type A (HSLAS Type A), or high-strength low-alloy steel Type B (HSLAS Type B); G185 (Z550) coating designation; and not less than 0.036 inch (0.9 mm) thick.
 - 1. Use for wood-preservative-treated lumber and where indicated.
- E. Stainless-Steel Sheet: ASTM A 666, Type 304.
 - 1. Use for exterior locations and where indicated.

2.8 MISCELLANEOUS MATERIALS

- A. Adhesives for Gluing Furring and Sleepers to Concrete or Masonry: Formulation complying with ASTM D 3498 that is approved for use indicated by adhesive manufacturer.
 - 1. Adhesives shall have a VOC content of 70 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 - 2. Adhesives shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
- B. Water-Repellent Preservative: NWWDA-tested and -accepted formulation containing 3-iodo-2-propynyl butyl carbamate, combined with an insecticide containing chlorpyrifos as its active ingredient.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Set rough carpentry to required levels and lines, with members plumb, true to line, cut, and fitted. Fit rough carpentry to other construction; scribe and cope as needed for accurate fit. Locate furring, nailers, blocking, grounds, and similar supports to comply with requirements for attaching other construction.
- B. Framing Standard: Comply with AF&PA's WCD 1, "Details for Conventional Wood Frame Construction," unless otherwise indicated.
- C. Framing with Engineered Wood Products: Install engineered wood products to comply with manufacturer's written instructions.
- D. Metal Framing Anchors: Install metal framing anchors to comply with manufacturer's written instructions. Install fasteners through each fastener hole.
- E. Install sill sealer gasket to form continuous seal between sill plates and foundation walls.
- F. Do not splice structural members between supports unless otherwise indicated.
- G. Provide blocking and framing as indicated and as required to support facing materials, fixtures, specialty items, and trim.

1. Provide metal clips for fastening gypsum board or lath at corners and intersections where framing or blocking does not provide a surface for fastening edges of panels. Space clips not more than 16 inches (406 mm) o.c.
- H. Sort and select lumber so that natural characteristics will not interfere with installation or with fastening other materials to lumber. Do not use materials with defects that interfere with function of member or pieces that are too small to use with minimum number of joints or optimum joint arrangement.
- I. Comply with AWWA M4 for applying field treatment to cut surfaces of preservative-treated lumber.
 1. Use inorganic boron for items that are continuously protected from liquid water.
 2. Use copper naphthenate for items not continuously protected from liquid water.
- J. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated, complying with the following:
 1. NES NER-272 for power-driven fasteners.
 2. Table 2304.9.1, "Fastening Schedule," in ICC's International Building Code.
 3. Table R602.3(1), "Fastener Schedule for Structural Members," and Table R602.3(2), "Alternate Attachments," in ICC's International Residential Code for One- and Two-Family Dwellings.
- K. Use steel common nails unless otherwise indicated. Select fasteners of size that will not fully penetrate members where opposite side will be exposed to view or will receive finish materials. Make tight connections between members. Install fasteners without splitting wood. Drive nails snug but do not countersink nail heads unless otherwise indicated.
- L. For exposed work, arrange fasteners in straight rows parallel with edges of members, with fasteners evenly spaced, and with adjacent rows staggered.
 1. Comply with indicated fastener patterns where applicable.
 2. Use finishing nails unless otherwise indicated. Countersink nail heads and fill holes with wood filler.
 3. Use common nails unless otherwise indicated. Drive nails snug but do not countersink nail heads.

3.2 WOOD GROUND, SLEEPER, BLOCKING, AND NAILER INSTALLATION

- A. Install where indicated and where required for attaching other work. Form to shapes indicated and cut as required for true line and level of attached work. Coordinate locations with other work involved.
- B. Attach items to substrates to support applied loading. Recess bolts and nuts flush with surfaces unless otherwise indicated.
- C. Where wood-preservative-treated lumber is installed adjacent to metal decking, install continuous flexible flashing separator between wood and metal decking.
- D. Provide permanent grounds of dressed, pressure-preservative-treated, key-beveled lumber not less than 1-1/2 inches (38 mm) wide and of thickness required to bring face of ground to exact thickness of finish material. Remove temporary grounds when no longer required.

3.3 WOOD FURRING INSTALLATION

- A. Install level and plumb with closure strips at edges and openings. Shim with wood as required for tolerance of finish work.
- B. Furring to Receive Plywood or Hardboard Paneling: Install 1-by-3-inch nominal- (19-by-63-mm actual-) size furring horizontally or vertically at 24 inches (610 mm) o.c.
- C. Furring to Receive Gypsum Board: Install 1-by-2-inch nominal- (19-by-38-mm actual-) size furring vertically at 16 inches (406 mm) o.c.

3.4 PROTECTION

- A. Protect wood that has been treated with inorganic boron (SBX) from weather. If, despite protection, inorganic boron-treated wood becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.
- B. Protect rough carpentry from weather. If, despite protection, rough carpentry becomes wet, apply EPA-registered borate treatment. Apply borate solution by spraying to comply with EPA-registered label.

END OF SECTION 06 10 00

SECTION 06 40 23 - INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Interior standing and running trim.
 - 2. Plastic-laminate cabinets.
 - 3. Plastic-laminate countertops and aprons.
 - 4. Shop finishing interior woodwork.
 - 5. Countertop supports.
 - 6. Cabinet and miscellaneous hardware.
- B. Related Sections include the following:
 - 1. Division 6 Section "Rough Carpentry" for wood blocking, shims, and hanging strips required for installing woodwork and concealed within other construction before woodwork installation.
 - 2. Division 7 Sealants.
 - 3. Division 9 Painting.

1.3 DEFINITIONS

- A. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips for installing woodwork items unless concealed within other construction before woodwork installation.

1.4 SUBMITTALS

- A. Product Data: For panel products, high-pressure decorative laminate, adhesive for bonding plastic laminate, solid-surfacing material, fire-retardant-treated materials, cabinet hardware and accessories and finishing materials and processes.
 - 1. Include data for fire-retardant treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

1. Show details full size.
2. Show locations and sizes of blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
3. Show locations and sizes of cutouts and holes for other items installed in architectural woodwork.
4. Apply AWI-certified compliance label to first page of Shop Drawings.

C. Samples for Initial Selection:

1. Shop-applied transparent finishes (on board and veneer panels).
2. Plastic laminates (PVC edgings not permitted for exposed surfaces).
3. Thermoset decorative panels (for cabinet interiors and other non-exposed surfaces).

D. Samples for Verification:

1. Lumber with or for transparent finish, not less than 5 inches wide by 24 inches long, for each species and cut, finished on 1 side and 1 edge.
2. Veneer-faced panel products with or for transparent finish, 8 by 10 inches, for each species and cut. Include at least one face-veneer seam and finish as specified.
3. Plastic laminates, 8 by 10 inches, for each type, color, pattern, and surface finish, with 1 sample applied to core material and specified edge material applied to 1 edge.
4. Thermoset decorative-panels, 8 by 10 inches, for each type, color, pattern, and surface finish, with edge banding on 1 edge.

E. Product Certificates: For each type of product, signed by product manufacturer.

F. Woodwork Quality Standard Compliance Certificates: AWI Quality Certification Program certificates.

G. Qualification Data: For fabricator/installer.

1.5 QUALITY ASSURANCE

- A. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance. Shop is a certified participant in AWI's Quality Certification Program.
- B. Installer Qualifications: Fabricator of products and certified participant in AWI's Quality Certification Program.
- C. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body. All non-FSC wood in assemblies with FSC-certified wood shall meet the FSC Controlled Wood (CW) criteria.
- D. Source Limitations: Engage a qualified woodworking firm to assume undivided responsibility for production of interior architectural woodwork with sequence-matched wood veneers and transparent-finished wood doors that are required to be of same species as woodwork.
- E. Quality Standard: Unless otherwise indicated, comply with AWI's "Architectural Woodwork Quality Standards" for grades of interior architectural woodwork indicated for construction, finishes, installation, and other requirements.

1. Provide AWI Quality Certification Program labels and certificates indicating that woodwork, including installation, complies with requirements of grades specified.
 2. The Contract Documents contain selections chosen from options in the quality standard and additional requirements beyond those of the quality standard. Comply with such selections and requirements in addition to the quality standard.
- F. Fire-Test-Response Characteristics: Where fire-retardant materials or products are indicated, provide materials and products with specified fire-test-response characteristics as determined by testing identical products per test method indicated by UL, ITS, or another testing and inspecting agency acceptable to authorities having jurisdiction. Identify with appropriate markings of applicable testing and inspecting agency in the form of separable paper label or, where required by authorities having jurisdiction, imprint on surfaces of materials that will be concealed from view after installation.
- G. Mockups: Build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
1. Approved mockups may become part of the completed Work if undisturbed at time of Substantial Completion.
- H. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
- 1.6 DELIVERY, STORAGE, AND HANDLING
- A. Do not deliver woodwork until painting and similar operations that could damage woodwork have been completed in installation areas. If woodwork must be stored in other than installation areas, store only in areas where environmental conditions comply with requirements specified in "Project Conditions" Article.
- 1.7 PROJECT CONDITIONS
- A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.
- B. Field Measurements: Where woodwork is 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.
1. Locate concealed framing, blocking, and reinforcements that support woodwork by field measurements before being enclosed, and indicate measurements on Shop Drawings.
 2. Established Dimensions: Where field measurements cannot be made without delaying the Work, establish dimensions and proceed with fabricating woodwork without field measurements. Provide allowance for trimming at site, and coordinate construction to ensure that actual dimensions correspond to established dimensions.

1.8 COORDINATION

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

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Wood Cabinet Units: Merillat Industries Classic Line of cabinet products, framed wood cabinets, laminate clad or approved equal. Door panel style and color and hardware style as selected by Owner from available manufacturer options. Provide all hardware and accessories necessary for doors, shelves, drawers, and sink inserts. Provide filler panels to match as required. Install all units level and plumb. Fasten securely. Locate grommets for outlets as coordinated with owner. Submittals shall include manufacturer's information, color samples for Owner's selection, shop drawings showing layout and dimensions of units, and section details. /Contractor shall be responsible for field verification of all dimensions.
- B. General: Provide materials that comply with requirements of AWI's quality standard for each type of woodwork and quality grade specified, unless otherwise indicated.
- C. Recycled Content: Provide particleboard and MDF with minimum 80 percent recycled content; plastic panels with recycled content.
- D. Composite wood installed within the building interior: Comply with low-emitting requirements of CARB or NAF.
- E. Wood Species or Interior running trim for Opaque Finish: Any closed-grain hardwood, premium grade.
- F. Wood Species of Interior running trim for Transparent Finish: Select White Birch
- G. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD.
 - 3. Particleboard: For all wood veneer panels in public spaces or egress corridors: Mat-formed wood particleboard, 45 pound density, complying with AWI 200-G-2. UL approved Class 1 fire retardant treated. ASTM E 84. Thickness: ¾". Flame Spread: 20. Representative Product: Duraflake FR by Weyerhaeuser.
 - 4. Softwood Plywood: DOC PS 1-83, APA standard as follows:
 - a. veneer grade: A-C plugged
 - b. Species: Group 1
 - c. Fire-retardant treated.
 - 5. Veneer-Faced Panel Products (Hardwood Plywood for transparent finish): HPVA HP-1. Plain-sliced Select White Birch:
 - a. Cut: Flat cut consistent clear, no sapwood, no blemishes.
 - b. Matching of adjacent veneer leaves: Book Match.
 - c. Matching within panel face: End Match to Adjacent Panels above and below.
 - d. Wood veneer:

- Crown Hardwood Veneer Corp., West Grove, PA (phone: 610-869-8771) or equal by one of the following:
- 1) Dooge Veneers, Inc. Grand Rapids, MI (phone: 616-698-6450).
 - 2) Bacon Veneer, Chicago, IL (N.Y. phone: 212-213-5200).
- e. Finish system: Refer to Division 9 Section "Painting"
- 1) Class A Flame Spread, Class 1 Finish Fire Rating. Panels shall have flame-spread index of 25 or less and smoke-developed index of 450 or less per ASTM E 84
- H. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.
1. Provide PVC or polyester edge banding on components with exposed or semiexposed edges.
- I. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.
1. Preferred Plastic Laminate Counter Top to be Nevamar Studio White Matrix Textured MR-7-IT, and Preferred Plastic Laminate Base Cabinet to be Nevamar ARP Plus Wild Oats Matrix Textured MR-7-2T
 2. Manufacturers: Subject to compliance with requirements and approved by owner. Provide high-pressure decorative laminates by one of the following:
 - a. Formica Corporation.
 - b. Pionite
 - c. Wilsonart International; Div. of Premark International, Inc.

2.2 CABINET HARDWARE AND ACCESSORIES

- A. General: Provide cabinet hardware and accessory materials associated with architectural cabinets.
- B. Frameless Concealed Hinges (European Type): BHMA A156.9, B01602, 170 degrees of opening (unless otherwise impractical), self-closing.
- C. Back-Mounted Pulls: BHMA A156.9, B02011.
- D. Wire Pulls: Back mounted, solid metal, 4 inches long, 5/16 inch in diameter, brushed stainless (typical).
- E. Z-clips/rails: Monarch Aluminum MF625 Z Clips (Panel Hanger Clips) or approved equal.
- F. Adjustable Shelf Standards and Supports: Metal. Supports with round pegs to be inserted into holes in cabinet walls..
- G. Drawer Slides: BHMA A156.9, B05091.
1. Heavy Duty (Grade 1HD-100 and Grade 1HD-200): Side mounted; full-overtravel-extension type; zinc-plated steel ball-bearing slides.
- H. Door Locks: BHMA A156.11, E07121.
- I. Drawer Locks: BHMA A156.11, E07041.

- J. Casters for mobile millwork:
 - 1. Swiveling caster without brake, plate mount, Häfele 670.12.901 or approved equal.
 - 2. Swiveling caster with brake, plate mount, Häfele 670.13.901 or approved equal.
- K. Coat and wall hooks: as shown on the drawings:
 - 1. polished aluminum double hook, Häfele 845.12.809 or approved equal.
- L. Grommets for Cable Passage through Countertops: 2-inch OD, black, molded-plastic grommets and matching plastic caps with slot for wire passage.
 - 1. Product: Subject to compliance with requirements, provide by Doug Mockett & Company, Inc.
- M. Crutch hook in health suite: 8" deep, zinc plated steel, 50lbs capacity
 - 1. Zoro #G1270123 or approved equal
- N. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.
 - 1. US32D, Satin Stainless steel.
- O. For concealed hardware, provide manufacturer's standard finish that complies with product class requirements in BHMA A156.9.

2.3 MISCELLANEOUS MATERIALS

- A. Anchors: Select material, type, size, and finish required for each substrate for secure anchorage. Provide nonferrous-metal or hot-dip galvanized anchors and inserts on inside face of exterior walls and elsewhere as required for corrosion resistance. Provide toothed-steel or lead expansion sleeves for drilled-in-place anchors.

2.4 FABRICATION, GENERAL

- A. Interior Woodwork Grade: Unless otherwise indicated, provide Premium-grade interior woodwork complying with referenced quality standard.
- B. Wood Moisture Content: Comply with requirements of referenced quality standard for wood moisture content in relation to ambient relative humidity during fabrication and in installation areas.
- C. Fabricate woodwork to dimensions, profiles, and details indicated. Ease edges to radius indicated for the following:
 - 1. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members 3/4 Inch Thick or Less: 1/16 inch.
 - 2. Edges of Rails and Similar Members More Than 3/4 Inch Thick: 1/8 inch.
 - 3. Corners of Cabinets and Edges of Solid-Wood (Lumber) Members and Rails: 1/16 inch.
- D. Complete fabrication, including assembly, finishing, and hardware application, to maximum extent possible before shipment to Project site. Disassemble components only as necessary for

shipment and installation. Where necessary for fitting at site, provide ample allowance for scribing, trimming, and fitting.

1. Notify Architect seven days in advance of the dates and times woodwork fabrication will be complete.
 2. Trial fit assemblies at fabrication shop that cannot be shipped completely assembled. Install dowels, screws, bolted connectors, and other fastening devices that can be removed after trial fitting. Verify that various parts fit as intended and check measurements of assemblies against field measurements indicated on Shop Drawings before disassembling for shipment.
- E. Shop-cut openings to maximum extent possible to receive hardware, appliances, plumbing fixtures, electrical work, and similar items. Locate openings accurately and use templates or roughing-in diagrams to produce accurately sized and shaped openings. Sand edges of cutouts to remove splinters and burrs.
1. Seal edges of openings in countertops with a coat of varnish.
- F. Install glass to comply with applicable requirements in Division 8 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

2.5 PLASTIC-LAMINATE CABINETS

- A. Grade: Premium
- B. AWI Type of Cabinet Construction: Flush overlay.
- C. Laminate Cladding for Exposed Surfaces: High-pressure decorative laminate complying with the following requirements:
1. Horizontal Surfaces Other Than Tops: Grade [HGS] .
 2. Postformed Surfaces: Grade [HGP].
 3. Vertical Surfaces: Grade [HGS].
 4. Edges: PVC edge banding, 0.12 inch (3 mm) thick, matching laminate in color, pattern, and finish.
- D. Materials for Semiexposed Surfaces:
1. Surfaces Other Than Drawer Bodies: High-pressure decorative laminate, Grade VGS or Thermoset decorative panels.
 - a. Edges of Plastic-Laminate Shelves: matching the High-Pressure Decorative Laminate
 - b. For semiexposed backs of panels with exposed plastic-laminate surfaces, provide surface of high-pressure decorative laminate, Grade [VGS] .
- E. Concealed Backs of Panels with Exposed Plastic Laminate Surfaces: High-pressure decorative laminate, Grade BKL.
- F. Colors, Patterns, and Finishes:
1. As selected by Architect from manufacturer's full range.

G. Colors, Patterns and Finishes: Basis-of-Design:

1. **[PLAM-1]** 312 Mailroom, 340 Breakroom
 - a. Manufacturer: Wilsonart
 - b. Color: Huntington Maple
 - c. Number: 7929-38
 - d. Finish: Fine Velvet Finish
 - e. Installation: Base Cabinets
2. **[PLAM-2]** 312 Mailroom, 340 Breakroom
 - a. Manufacturer: Wilsonart
 - b. Color: Frosty White
 - c. Number: 1753-60
 - d. Finish: Matte Finish
 - e. Installation: Countertops
3. **[PLAM-3]** Reception Desk
 - a. Manufacturer: Wilsonart
 - b. Color: Misted Zephyr
 - c. Number: 4843-60
 - d. Finish: Matte Finish
 - e. Installation: Countertop

- H. Provide dust panels of 1/4-inch (6.4-mm) plywood or tempered hardboard above compartments and drawers, unless located directly under tops

2.6 PLASTIC-LAMINATE COUNTERTOPS

- A. Grade: Premium.
- B. High-Pressure Decorative Laminate Grade: HGS.
- C. Edge Treatment: Same as laminate cladding on horizontal surfaces.
- D. Core Material: Particleboard or medium-density fiberboard for wet applications
- E. Backer Sheet: Provide plastic-laminate backer sheet, Grade BKL, on underside of countertop substrate.

2.8 COUNTERTOP SUPPORTS

- A. Provide steel concealed brackets by A&M Hardware, Inc. or approved equal.
 1. Size: Coordinate with countertop detail for required supporting arm depth.
 2. Install bracket within stud wall construction directly to metal studs.

2.10 SHOP FINISHING

- A. Grade: Provide finishes of same grades as items to be finished.
- B. General: Finish architectural woodwork at fabrication shop as specified. Defer only final touchup, cleaning, and polishing until after installation.

- C. General: Shop finish transparent-finished interior architectural woodwork at fabrication shop as specified in Division 9 Painting Section for finishing architectural woodwork.
- D. Preparation for Finishing: Comply with referenced quality standard for sanding, filling countersunk fasteners, sealing concealed surfaces, and similar preparations for finishing architectural woodwork, as applicable to each unit of work.
 - 1. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling and to end-grain surfaces. Concealed surfaces of plastic-laminate-clad woodwork do not require backpriming when surfaced with plastic laminate, backing paper, or thermoset decorative panels.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas.
- B. Before installing architectural woodwork, examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

3.2 INSTALLATION

- A. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.
- B. Assemble woodwork and complete fabrication at Project site to comply with requirements for fabrication in Part 2, to extent that it was not completed in the shop.
- C. Install woodwork level, plumb, true, and straight. Shim as required with concealed shims. Install level and plumb (including tops) to a tolerance of 1/8 inch in 96 inches.
- D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.
- E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.
- F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Do not use pieces less than 60 inches long, except where shorter single-length pieces are necessary. Scarf running joints and stagger in adjacent and related members.
 - 1. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.

2. Install standing and running trim with no more variation from a straight line than 1/8 inch in 96 inches.
- G. Cabinets: Install without distortion so doors and drawers fit openings properly and are accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation. Complete installation of hardware and accessory items as indicated.
1. Install cabinets with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 2. Maintain veneer sequence matching of cabinets with transparent finish.
 3. Fasten wall cabinets through back, near top and bottom, at ends and not more than 16 inches o.c. with No. 10 wafer-head screws sized for 1-inch penetration into wood framing, blocking, or hanging strips
- H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop.
1. Align adjacent solid-surfacing-material countertops and form seams to comply with manufacturer's written recommendations using adhesive in color to match countertop. Carefully dress joints smooth, remove surface scratches, and clean entire surface.
 2. Install countertops with no more than 1/8 inch in 96-inch sag, bow, or other variation from a straight line.
 3. Secure backsplashes to walls with adhesive.
 4. Calk space between backsplash and wall with sealant specified in Division 7 Section "Joint Sealants."
- I. Touch up finishing work specified in this Section after installation of woodwork. Fill nail holes with matching filler where exposed.
- J. Refer to Division 9 Sections for final finishing of installed architectural woodwork not indicated to be shop finished.

3.3 ADJUSTING AND CLEANING

- A. Repair damaged and defective woodwork, where possible, to eliminate functional and visual defects; where not possible to repair, replace woodwork. Adjust joinery for uniform appearance.
- B. Clean, lubricate, and adjust hardware.
- C. Clean woodwork on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

END OF SECTION 06 40 23

SECTION 07 21 00 - INSULATION

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. Glass Fiber Blanket Insulation.
 - 2. Mineral-wool blanket acoustic insulation.
 - 3. Spray polyurethane foam insulation.
- B. Related Sections:
 - 1. Section 07 84 46 "Fire-Resistive Joint Systems" for insulation installed as part of a perimeter fire-resistive joint system.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 QUALITY ASSURANCE

- A. Surface-Burning Characteristics: As determined by testing identical products according to ASTM E 84 by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
 - 1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
 - 2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
 - 3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Recycled Content: Provide mineral wool insulation with minimum 75 percent recycled content; provide polystyrene insulation with minimum 20 percent recycled content; provide glass fiber insulation with minimum 20 percent recycled content.
- B. Thermal and acoustic insulation installed within the building interior: Comply with emissions requirements of CDPH Standard Test Method in Section 01 81 13.

2.2 ACOUSTIC MINERAL-WOOL BLANKET INSULATION (For Interior Acoustic & Fire-rated Walls)

- A. Manufacturers: Acceptable Material: ROCKWOOL ACOUSTICAL FIRE BATT™. Subject to compliance with requirements, provide products by one of the following:
 - 1. Owens Corning: Thermafiber SAFB. (Sound Attenuation Fire Blankets).
- B. Description: Unfaced, Mineral-Wool Blanket Insulation: Non-combustible, lightweight, semi-rigid stone wool batt insulation per ASTM C665, Type 1.
 - 1. Fire performance:
 - a. Non-combustibility: Per ASTM E136.
 - b. Surface Burning Characteristics: Per ASTM E84.
 - 1) Flame spread: 0.
 - 2) Smoke developed: 0.
 - 2. Density: minimum 2.5 lbs/ft³ per ASTM C303.
 - 3. R-Value:
 - a. Interior walls: R-13 to R-23
 - b. Above Ceiling: 2-inch thick R-30 to R-49 for acoustic separation.

2.3 SPRAY POLYURETHANE FOAM INSULATION

- A. Closed-Cell Polyurethane Foam Insulation: ASTM C 1029, Type II, with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, per ASTM E 84 for insulating around penetrations in exterior walls.
 - 1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - a. BASF Corporation.
 - b. BaySystems NorthAmerica, LLC.
 - c. Dow Chemical Company (The).
 - d. ERSystems, Inc.
 - e. Gaco Western Inc.
 - f. Henry Company.
 - g. NCFI; Division of Barnhardt Mfg. Co.
 - h. SWD Urethane Company.
 - i. Volatile Free, Inc.

2. Minimum density of 1.5 lbs/ft³, thermal resistivity per inch of 6.2 h ft² °F/Btu at 75 °F.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Clean substrates of substances that are harmful to insulation or vapor retarders, including removing projections capable of puncturing vapor retarders, or that interfere with insulation attachment.

3.2 INSTALLATION, GENERAL

- A. Comply with insulation manufacturer's written instructions applicable to products and applications indicated.
- B. Install insulation that is undamaged, dry, and unsoiled and that has not been left exposed to ice, rain, or snow at any time.
- C. Extend insulation to envelop entire area to be insulated. Cut and fit tightly around obstructions and fill voids with insulation. Remove projections that interfere with placement.
- D. Provide sizes to fit applications indicated and selected from manufacturer's standard thicknesses, widths, and lengths. Apply single layer of insulation units to produce thickness indicated unless multiple layers are otherwise shown or required to make up total thickness.

3.3 INSTALLATION OF INSULATION FOR FRAMED CONSTRUCTION

- A. Apply insulation units to substrates by method indicated, complying with manufacturer's written instructions. If no specific method is indicated, bond units to substrate with adhesive or use mechanical anchorage to provide permanent placement and support of units.
- B. Mineral-Wool Blanket Insulation: Install in cavities formed by framing members according to the following requirements:
 1. Use insulation widths and lengths that fill the cavities formed by framing members. If more than one length is required to fill the cavities, provide lengths that will produce a snug fit between ends.
 2. Place insulation in cavities formed by framing members to produce a friction fit between edges of insulation and adjoining framing members.
 3. Maintain 3-inch (76-mm) clearance of insulation around recessed lighting fixtures not rated for or protected from contact with insulation.
- C. Spray-Applied Insulation: Apply spray-applied insulation according to manufacturer's written instructions. Do not apply insulation until installation of pipes, ducts, conduits, wiring, and electrical outlets in walls is completed and windows, electrical boxes, and other items not indicated to receive insulation are masked. After insulation is applied, make flush with face of studs by using method recommended by insulation manufacturer.

- D. Miscellaneous Voids: Install insulation in miscellaneous voids and cavity spaces where required to prevent gaps in insulation using the following materials:
 - 1. Loose-Fill Insulation: Compact to approximately 40 percent of normal maximum volume equaling a density of approximately 2.5 lb/cu. ft. (40 kg/cu. m).
 - 2. Spray Polyurethane Insulation: Apply according to manufacturer's written instructions.

3.4 INSTALLATION OF INSULATION IN CEILINGS FOR SOUND ATTENUATION

- A. Where insulation blankets are indicated for sound attenuation above ceilings, install blanket insulation over entire ceiling area in thicknesses indicated.

3.5 PROTECTION

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

END OF SECTION 07 21 00

SECTION 07 92 00 - JOINT SEALANTS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes joint sealants, fillers and adhesives for the following applications, including those specified by reference to this Section:
 - 1. Interior and exterior joints in the following vertical surfaces and horizontal surfaces:
 - a. Control and expansion joints on exposed surfaces of masonry walls.
 - b. Joints where countertops abut vertical surfaces.
 - c. Perimeter joints between interior wall surfaces and frames of interior doors windows, elevator entrances and wood bases.
 - d. Joints between plumbing fixtures and adjoining walls, floors, and counters.
 - e. Tile control and expansion joints.
 - f. MCM panel joints.
- B. Related Sections include the following:
 - 1. Division 8 Section "Glazing" for butt glazing sealant.
 - 2. Division 9 Section "Gypsum Board Assemblies" for locations of perimeter joints of gypsum board partitions to reduce sound transmission, with products specified in this section.
 - 3. Division 8 Sections "Wood Doors" and "Hollow Metal Doors and Frames" for sealants applied to junction of door frames and partitions.

1.2 PERFORMANCE REQUIREMENTS

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

1.3 SUBMITTALS

- A. Product Data: For each joint-sealant product indicated.
- B. Samples for Initial Selection: Manufacturer's color charts consisting of strips of cured sealants showing the full range of colors available for each product exposed to view.
- C. Samples for Verification: For each type and color of joint sealant required, provide Samples with joint sealants in 1/2-inch- (13-mm-) wide joints formed between two 6-inch- (150-mm-) long strips of material matching the appearance of exposed surfaces adjacent to joint sealants.
- D. Field Test Report Log: For each elastomeric sealant application.
- E. Warranties: Special warranties specified in this Section.

1.5 PROJECT CONDITIONS

- A. Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside limits permitted by joint-sealant manufacturer.
 2. When joint substrates are wet.
 3. Where joint widths are less than those allowed by joint-sealant manufacturer for applications indicated.
 4. Contaminants capable of interfering with adhesion have not yet been removed from joint substrates.

1.6 WARRANTY

- F. Special Installer's Warranty: Installer's standard form in which Installer agrees to repair or replace elastomeric 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.
- G. Special Manufacturer's Warranty: Manufacturer's standard form in which elastomeric sealant manufacturer agrees to furnish elastomeric joint sealants to repair or replace those that do not comply with performance and other requirements specified in this Section within specified warranty period.
1. Warranty Period: 5 years from date of Substantial Completion.
- H. Special warranties specified in this Article exclude deterioration or failure of elastomeric joint sealants from the following:
1. Movement of the structure resulting in stresses on the sealant exceeding sealant manufacturer's written specifications for sealant elongation and compression caused by structural settlement or errors attributable to design or construction.
 2. Disintegration of joint substrates from natural 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 MANUFACTURERS

- A. Products: Subject to compliance with requirements, provide one of the products listed.

2.2 MATERIALS, GENERAL

- A. Compatibility: Provide joint sealants, backings, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer, based on testing and field experience.
- B. Colors of Exposed Joint Sealants: As selected by Architect from manufacturer's full range.
- C. Architectural Sealants:

1. Toxicity/IEQ:
 - a. Comply with applicable regulations regarding toxic and hazardous materials, and as specified. Sealants must meet or exceed requirements South Coast Air Quality Management District (SCAQMD) #1168.
 - b. Sealants containing aromatic solvents, fibrous talc, formaldehyde, halogenated solvents, mercury, lead, cadmium, chromium and their compounds, are not permitted.

2.3 ELASTOMERIC JOINT SEALANTS

- A. Elastomeric Sealants: Comply with ASTM C 920 and other requirements indicated for each liquid-applied chemically curing sealant specified, including those referencing ASTM C 920 classifications for type, grade, class, and uses related to exposure and joint substrates.
- B. Stain-Test-Response Characteristics: Where elastomeric sealants are specified to be nonstaining to porous substrates, provide products that have undergone testing according to ASTM C 1248 and have not stained porous joint substrates indicated for Project.
- C. Suitability for Contact with Food: Where elastomeric sealants are indicated for joints that will come in repeated contact with food, and for all countertop sealants provide products that comply with 21 CFR 177.2600.
- D. Single-Component Neutral-Curing Silicone Sealant [ES-1]:
 1. Available Products:
 - a. GE Silicones; SilPruf SCS2000.
 - b. Pecora Corporation; 864.
 - c. Pecora Corporation; 890.
 - d. Polymeric Systems Inc.; PSI-641.
 - e. Sonneborn, Division of ChemRex Inc.; Omniseal.
 - f. Tremco; Spectrem 3.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 50.
 4. Use Related to Exposure: NT (nontraffic).
- E. Single-Component Mildew-Resistant Neutral-Curing Silicone Sealant [ES-4]:
 1. Products:
 - a. Dow Corning; 786 Mildew Resistant.
 - b. Pecora Corporation; 898.
 - c. Tremco; Tremsil 600.
 2. Type and Grade: S (single component) and NS (nonsag).
 3. Class: 25.
 4. Use Related to Exposure: NT (nontraffic).
 5. Uses Related to Joint Substrates: M, G, A, and O.

2.4 LATEX JOINT SEALANTS

- A. Latex Sealant [LS]: Comply with ASTM C 834, Type P, Grade NF.

B. Available Products:

1. Bostik Findley; Chem-Calk 600.
2. Pecora Corporation; AC-20+.
3. Schnee-Morehead, Inc.; SM 8200.
4. Sonneborn, Division of ChemRex Inc.; Sonolac.
5. Tremco; Tremflex 834.

2.5 ACOUSTICAL JOINT SEALANTS

A. Acoustical Sealant [AS] for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant complying with ASTM C 834 and the following:

1. Product effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.
2. Elastomeric Flexible Clear Sealants:
 - a. Sound Specialties Coatings Corporation: Slickthane high solids polyurethane-acrylic blend, single component ambient or heat cure, zero to low VOC, waterborne.

B. Non-hardening fire-stop sealant:

1. Gun or trowel-applied intumescent sealant: 3M "CPW-25WB+" or approved equal.
2. Moldable intumescent putty: 3M "Fire Barrier Moldable Putty+" or approved equal.
3. Non-intumescent silicone sealant: 3M "Silicone Fire Stop", USG "SmokeSeal" or approved equal) may be used in lieu of the sealant on foam rod in noise sensitive walls that are also fire rated.

2.6 FOAM BACKER ROD

- A. Closed cell polyethylene backer rod, ASTM C1193
- B. Acceptable Manufacturers: ITP, Nomaco, or approved equal.

2.7 JOINT-SEALANT BACKING

- A. General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type 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. Elastomeric Tubing Sealant Backings: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, and capable of remaining resilient at temperatures down to minus 26 deg F (minus 32 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and to otherwise contribute to optimum sealant performance.

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

2.8 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: Non-staining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.
- D. Expansion Joint Filler: W.R. Meadows, Sealtight, multi-purpose expansion-contraction joint filler in recommended thickness for anticipated range of joint movement. Adhere to one plane surface.

2.9 ADHESIVES

- A. Material recommended by adhesive manufacturer for application of material to substrate for intended application.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint-sealant performance.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with joint-sealant manufacturer's written instructions and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining after cleaning operations above by vacuuming or blowing out joints with oil-free compressed air. Porous joint substrates include the following:

- a. Concrete.
 - b. Masonry.
 - c. Unglazed surfaces of ceramic tile.
 - d. Other porous substrates.
 3. Remove laitance and form-release agents from concrete.
 4. Clean nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants. Nonporous joint substrates include the following:
 - a. Porcelain enamel.
 - b. Glazed surfaces of ceramic tile.
 - c. Other porous substrates.
 - B. Joint Priming: Prime joint substrates, where recommended in writing by joint-sealant manufacturer, based on preconstruction joint-sealant-substrate tests or prior experience. Apply primer to comply with joint-sealant manufacturer's written instructions.
 - C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged.
- ### 3.3 INSTALLATION OF JOINT SEALANTS
- A. General: Comply with joint-sealant manufacturer's written installation instructions for products and applications indicated, unless more stringent requirements apply.
 - B. Sealant Installation Standard: Comply with recommendations in ASTM C 1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
 - C. Sealants for Stone Masonry: Provide non-staining sealant systems as certified by test data and as recommended by manufacturer for sealing interior and exterior stone facing joints.
 - D. Acoustical Sealant Application Standard: Comply with recommendations in ASTM C 919 for use of joint sealants in acoustical applications as applicable to materials, applications, and conditions indicated.
1. Furnish and install acoustical sealant at the following locations:
 - a. All penetrations of partition, wall, and floor construction by ductwork, conduit, piping, or structure
 - b. All termination of partitions enclosing Noise Critical Spaces to abutting construction (e.g. partitions, structure, etc.)
 - c. Both sides of door frames to abutting construction where doors are scheduled to have acoustical seals
 - d. Both sides of window frames to adjacent construction at windows in partitions enclosing Noise Critical Spaces.
 - e. Perimeter of penetrations through sound isolating ceilings, roof systems, and floor systems
 2. Backer Rod shall be used in all joints greater than ¼ inch. Product to be constructed of closed cell foam, or appropriate resilient material for sealant. Dimension shall be minimum 30% greater than joint width, unless otherwise indicated on details.

- E. 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.
- F. Install bond-breaker tape behind sealants where sealant backings are not used between sealants and backs of joints.
- G. 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.
- H. Tooling of Nonsag Sealants: Immediately after sealant application and before skinning or curing begins, tool sealants according to requirements specified below to form smooth, uniform beads of configuration indicated; to eliminate air pockets; and to ensure contact and adhesion of sealant with sides of joint.
 - 1. Remove excess sealant from surfaces adjacent to joints.
 - 2. Use tooling agents that are approved in writing by sealant manufacturer and that do not discolor sealants or adjacent surfaces.
 - 3. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
 - 4. Provide flush joint configuration where indicated per Figure 5B in ASTM C 1193.
 - 5. Provide recessed joint configuration of recess depth and at locations indicated per Figure 5C in ASTM C 1193.
 - a. Use masking tape to protect surfaces adjacent to recessed tooled joints.
- I. Installation of Preformed Silicone-Sealant System: Comply with the following requirements:
 - 1. Apply masking tape to each side of joint, outside of area to be covered by sealant system.
 - 2. Apply silicone sealant to each side of joint to produce a bead of size complying with preformed silicone-sealant system manufacturer's written instructions and covering a bonding area of not less than 3/8 inch (10 mm). Hold edge of sealant bead 1/4 inch (6 mm) inside masking tape.
 - 3. Within 10 minutes of sealant application, press silicone extrusion into sealant to wet extrusion and substrate. Use a roller to apply consistent pressure and ensure uniform contact between sealant and both extrusion and substrate.
 - 4. Complete installation of sealant system in horizontal joints before installing in vertical joints. Lap vertical joints over horizontal joints. At ends of joints, cut silicone extrusion with a razor knife.
- J. Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, producing seal continuity at ends, turns, and intersections of joints. For applications at low ambient

temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in compliance with sealant manufacturer's written instructions.

3.4 FIELD QUALITY CONTROL

1. Inspect joints for complete fill, for absence of voids, and for joint configuration complying with specified requirements. Record results in a field-adhesion-test log.
 2. Inspect tested joints and report on the following:
 - a. 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 type of product and joint substrate. Compare these results to determine if adhesion passes sealant manufacturer's field-adhesion hand-pull test criteria.
 - b. Whether sealants filled joint cavities and are free of voids.
 - c. Whether sealant dimensions and configurations comply with specified requirements.
 3. 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 fill, sealant configuration, and sealant dimensions.
 4. 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.
- B. Evaluation of Field 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.

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 and remove damaged or deteriorated joint sealants immediately so installations with repaired areas are indistinguishable from original work.

3.7 Sealant Schedule:

LOCATION	SYSTEM NO.	CUSTOM COLOR
Masonry/Masonry	ES-1	Yes
Masonry/Metal	ES-1	Yes
Metal/Metal	ES-1	Yes

BCDC LOBBY RENOVATION
BALTIMORE COUNTY, MARYLAND
JOB ORDER NUMBER – PROJ-10001187
CONTRACT NUMBER – 25122 PO0

PROJECT MANUAL
100% CONSTRUCTION DOCUMENTS
6-13-2025

Tile/Fixtures	ES-4	Yes
Painter's Caulk	LS	No
Interior Acoustical Joints	AS	No

END OF SECTION 07 92 00

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. Light frames and glazing installed in hollow metal doors.

B. Related Sections:

1. Division 08 Section "Flush Wood Doors".
2. Division 08 Section "Glazing" for glass view panels in hollow metal doors.
3. Division 08 Section "Door Hardware".
4. Division 09 Sections "Interior Painting" for field painting hollow metal doors and frames.
5. Division 28 Section "Access Control" for access control devices installed at door openings and provided as part of a security access control system.

C. 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.
 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.
- C. 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. 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 COORDINATION

- A. Coordinate installation of anchorages for hollow metal frames. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors. Deliver such items to Project site in time for installation.

1.8 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace doors that fail in materials or workmanship for a period of at least two years.
- 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. Republic.
 - 2. Other manufacturers must comply with performance requirements and be approved by the owner.
 - a. CECO Door Products (CE).
 - b. Curries Company (CU).
 - c. Steelcraft (ST).

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.
- D. Recycled Content: Provide steel and aluminum with minimum 25 percent post-consumer recycled content.

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. 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.
 - 2. Core Construction: Manufacturer's standard kraft-paper honeycomb, or one-piece polystyrene core, securely bonded to both faces.
 - 3. Level/Model: Level 2 and Physical Performance Level B (Heavy Duty), Minimum 20 gauge thick steel, Model 2.
 - 4. 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.
 - 5. 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.
 - 6. Hardware Reinforcements: Fabricate according to ANSI/SDI A250.6 with reinforcing plates from same material as door face sheets.

2.4 SPECIAL FUNCTION HOLLOW METAL DOORS

- A. Stile and Rail Hollow Metal Doors: Subject to the same compliance standards and requirements as standard hollow metal doors, provide insulated tubular stile and rail constructed, 1-3/4" thick doors fabricated from minimum 16 gauge steel with flush tubular steel tops. Stiles to extend the full height of the door and rails internally welded or permanently mechanically joined to the stiles forming a neat seam on the face.

2.5 METAL DOORS – BULLET RESISTANT

- A. All ballistic rated metal doors are to be Level 3 bullet resistant 16-gauge steel doors.
- B. Basis of Design:
 - 1. Subject to compliance with requirements, provide products by the following:
 - a. Total Security Solutions, Inc., 935 Garden Lane, Fowlerville, MI 48836, 866 734-6277. Attn: Sales Department, sales@tssbulletproof.com. Web: www.tssbulletproof.com.
 - 2. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved by owner.

C. Door and Frame Performance

1. Standard door and frame assembly shall be manufactured to defeat ballistic assaults from a .44 magnum superpower small arms handgun, in accordance with UL Standard 752, Level 3
2. Steel for face plates shall be 14 gauge, with ballistic proprietary core.
3. Rails and stiles shall be fully welded to face plates and provide a flush surface on all edges.
4. Door unit shall be pre-hung with a continuous gear hinge in a steel frame.
5. Door and frame shall be mortised and reinforced at the factory for template hardware per hardware schedule.
6. Peepholes, view windows and door scopes shall be pre-drilled and factory installed.

2.6 HOLLOW METAL FRAMES

- A. General: Comply with ANSI/SDI A250.8 and with details indicated for type and profile.
- B. 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.
- C. Hardware Reinforcement: Fabricate according to ANSI/SDI A250.6 Table 4 with reinforcement plates from same material as frames.

2.7 HOLLOW METAL FRAMES – BULLET RESISTANT

- A. Basis of Design:
1. Subject to compliance with requirements, provide products by the following:
 - a. Total Security Solutions, Inc., 935 Garden Lane, Fowlerville, MI 48836, 866 734-6277. Attn: Sales Department, sales@tssbulletproof.com. Web: www.tssbulletproof.com.
 2. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved by owner.
- B. Design Performance:
1. Ballistic Resistant:
 - a. Level 3 in accordance with UL 752 – Testing for Ballistic Resistance for the complete assembly including framing, glazing and panels.
 2. Through the design, manufacturing techniques and material application the Bullet Resistant Hollow Metal Frame shall be of the non-ricochet type. This design is intended

- to permit the retention of an attacking projectile lessening the potential of a random injury or lateral penetration.
3. All joints and connections shall be tight, providing hairline points and true alignment of adjacent members.

C. Frame Dimensions: As indicated on the Drawings.

D. Frame Performance:

1. Frame shall be manufactured to defeat ballistic assaults in accordance with UL Standard 752, Levels 1 through 8.

E. Frame Construction:

1. Frame construction:
 - a. 16 gauge commercial cold rolled steel.
2. Steel shall be free of scale, pitting, coil breaks or other surface defects.
3. Frames shall be welded and ground flush.
4. Standard tolerances shall be +/- 1/16" for frame opening width, height, and diagonal.

F. Field alterations to the construction of the assembly fabricated under the acceptable standards are not allowed unless approved in writing by the manufacturer and the Architect.

G. Standard manufacturing tolerances +/- 1/16" shall be maintained.

2.8 FRAME ANCHORS

A. Jamb Anchors:

1. Provide minimum of three anchors per jamb.
2. 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.
3. Stud Wall Type: Designed to engage stud and not less than 0.042 inch thick.

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.

2.9 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.

2.10 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.
- C. Provide door silencers by Door Controls International.
 - 1. Three per strike jamb on single doors.

2.11 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".
 - 5. Electrical Raceways: Provide hollow metal doors to receive electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through-wire transfer hardware or wiring

harness specified in hardware sets in Division 08 Sections "Door Hardware" and "Access Control Hardware". Wire nut connections are not acceptable.

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.

2.12 STEEL FINISHES

- 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. **Coordinate with threshold installation and detailed in the shop drawings.**
 - 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 081113

SECTION 08 14 16 - FLUSH WOOD DOORS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Section Includes:

1. Solid core doors with wood veneer faces.
2. Factory finishing wood doors.
3. Factory fitting wood doors to frames and factory machining for hardware.
4. Louvers installed in flush wood doors.

B. Related Sections:

1. Division 08 Section "Hollow Metal Doors and Frames" for wood doors in steel frames.
2. Division 08 Section "Glazing" for glass view panels in wood doors (except for fire-rated doors).
3. Division 08 Section "Door Hardware" for door hardware for flush wood doors and wood frames.

C. Standards and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A208.1 – Wood Particleboard.
2. Intertek Testing Service (ITS Warnock Hersey) - Certification Listings for Fire Doors.
3. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association.
4. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association.
5. UL 10C - Positive Pressure Fire Tests of Door Assemblies; UL 1784 - Standard for Air Leakage Tests of Door Assemblies.
6. Window and Door Manufacturers Association - WDMA I.S.1-A Architectural Wood Flush Doors.

1.3 SUBMITTALS

- A. Product Data: For each type of door indicated. Include details of core and edge construction, louvers, trim for openings, and WDMA I.S.1-A or AWS classifications. Include factory finishing specifications.
- B. Door hardware supplier is to furnish templates, template reference number and/or physical hardware to the wood door supplier in order to prepare the doors and frames to receive the finish hardware items.

- C. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
 - 1. Indicate dimensions and locations of mortises and holes for hardware.
 - 2. Indicate dimensions and locations of cutouts.
 - 3. Indicate requirements for veneer matching.
 - 4. Indicate doors to be factory finished and finish requirements.
 - 5. Indicate fire protection ratings for fire rated doors.
- D. Samples for Initial Selection: For factory finished doors.
 - 1. Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
 - 2. Corner sections of doors, 8 by 10 inches, with door faces and edges representing actual materials to be used.
 - a. Provide samples for each species of veneer and solid lumber required.
 - b. Finish veneer faced door samples with same materials proposed for factory finished doors.
 - 3. Frames for light openings, 6 inches long, for each material, type, and finish required.
- E. Informational Submittals:
 - 1. Submit manufacturer's environmental documentation and applicable sustainability program credits that are available to contribute towards a LEED rated project certification.
- F. Warranty: Sample of special warranties.

1.4 QUALITY ASSURANCE

- A. Source Limitations: Obtain flush wood doors through one source from a single manufacturer wherever possible.
 - 1. Forest Certification: Provide wood products made from forests certified by an FSC-accredited certification body.
 - a. All non-FSC wood in assemblies with FSC-certified wood: Meet the FSC Controlled Wood (CW) criteria.
- B. Quality Standard: In addition to requirements specified, comply with WDMA I.S.1-A, latest edition, "Industry Standard for Architectural Wood Flush Doors".
- C. Pre-Construction Conference: Conduct conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier, Installer, and Contractor to review proper methods and procedures for receiving, handling, and installing flush wood doors.

1.5 DELIVERY, STORAGE, AND HANDLING

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

1.6 PROJECT CONDITIONS

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

1.7 WARRANTY

- A. 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.
 - 1. Failures include, but are not limited to, the following:
 - a. Warping (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section.
 - b. Telegraphing of core construction in wood face veneers exceeding 0.01 inch in a 3-inch span.
 - c. Telegraphing of core construction and delaminating of face in decorative laminate-faced doors.
 - 2. Warranty includes installation and finishing that may be required due to repair or replacement of defective doors.
 - 3. Warranty Period for Solid Core Interior Doors: Life of installation according to manufacturer's written warranty.

PART 2 - PRODUCTS

2.1 DOOR CONSTRUCTION – GENERAL

- A. WDMA I.S.1-A Performance Grade: Extra Heavy Duty; Aesthetic Grade: Premium.
- B. Recycled Content: Provide composite wood door cores with minimum 60 percent recycled content; provide fire-rated doors with at least 20 percent recycled content.

2.2 CORE CONSTRUCTION

- A. Particleboard Core Doors:

1. Particleboard: Wood fiber-based materials complying with ANSI A208.1 Particleboard standard. Grade LD-2.
 2. Adhesive: Fully bonded construction using Polyurethane (PUR) glue.
 3. Blocking: When through-bolted hardware is not used, provide wood blocking in particleboard core doors as follows:
 - a. 5-inch (125-mm) top-rail blocking, in doors indicated to have closers.
 - b. 5-inch (125-mm) mid-rail blocking, in doors indicated to have exit devices.
- 1) Optional Cores for Blocking: Provide doors with either glued-wood-stave or structural-composite-lumber core instead of particleboard core for doors indicated to receive closers and exit devices.

2.3 VENEERED DOORS FOR TRANSPARENT FINISH

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

9. At doors over 40% of the face cut-out for lights and or louvers, furnish engineered composite lumber core.

2.4 LIGHT FRAMES AND GLAZING

- A. Glazing: Comply with installation requirements in Division 08 Section "Glazing" and with the flush wood door manufacturer's written instructions.

2.5 FABRICATION

- A. Factory fit doors to suit frame opening sizes indicated. Comply with clearance requirements of referenced quality standard for fitting unless otherwise indicated.
- B. Factory machine doors for hardware that is not surface applied. Comply with final hardware schedules, door frame Shop Drawings, DHI A115-W series standards, and hardware templates.
 1. Coordinate with hardware mortises in metal frames to verify dimensions and alignment before factory machining.
 2. Metal Astragals: Factory machine astragals and formed steel edges for hardware for pairs of fire rated doors.
- C. Transom and Side Panels: Fabricate matching panels with same construction, exposed surfaces, and finish as specified for associated doors. Finish bottom edges of transoms and top edges of rabbeted doors same as door stiles.
- D. Openings: Cut and trim openings through doors in factory.
 1. Light Openings: Trim openings with moldings of material and profile indicated. If not indicated, provide standard pre-finished metal trim kits in color as selected by Architect from manufacturer's standard colors.
 2. Glazing: Comply with applicable requirements in Division 08 Section "Glazing."
- E. Electrical Raceways: Provide flush wood doors receiving electrified hardware with concealed wiring harness and standardized Molex™ plug connectors on both ends to accommodate up to twelve wires. Coordinate connectors on end of the wiring harness to plug directly into the electrified hardware and the through wire transfer hardware or wiring harness specified in hardware sets in Division 08 "Door Hardware". Wire nut connections are not acceptable.

2.6 FACTORY FINISHING

- A. General: Comply with referenced quality standard for factory finishing. Complete fabrication, including fitting doors for openings and machining for hardware that is not surface applied, before finishing.
 1. Finish faces, all four edges, edges of cutouts, and mortises. Stains and fillers may be omitted on top and bottom edges, edges of cutouts, and mortises.
- B. Transparent Finish: Provide a clear protective coating over the wood veneer allowing the natural color and grain of the selected wood species to provide the appearance specified. Stain is applied to the wood surface underneath the transparent finish to add color and design flexibility.

1. Grade: Premium.
2. Finish: Meet or exceed WDMA I.S. 1A TR6 Catalyzed Polyurethane finish performance requirements.
3. Staining: As selected by Architect from manufacturer's full range.
4. Sheen: Satin.

PART 3 - EXECUTION

3.1 EXAMINATION

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

3.2 INSTALLATION

- A. Hardware: For installation, see Division 8 Section "Door Hardware."
- B. Installation Instructions: Install doors to comply with manufacturer's written instructions and the referenced quality standard, and as indicated.
 1. Install fire rated doors in corresponding fire rated frames according to NFPA 80.
- C. Factory Fitted Doors: Align in frames for uniform clearance at each edge.
- D. Factory Finished Doors: Restore finish before installation if fitting or machining is required at Project site.

3.3 ADJUSTING

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

END OF SECTION 08 14 16

SECTION 08 56 53 – TRANSACTION WINDOW - ALUMINUM VOICE AROUND

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Bullet resistant voice around aluminum transaction window.

1.2 REFERENCES

- A. Underwriters Laboratory UL 752-Standard for Bullet Resisting Equipment.
- B. ASTM E119-98- Standard Test Methods for Fire Tests of Building Construction and Materials.
- C. ASTM B 209/B 209M- Standard Specification for Aluminum and Aluminum Alloy Sheet and Plate.
- D. ASTM A 666-Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar.

1.3 ACTION SUBMITTALS

- A. Refer to Section 01 33 00 Submittal Procedures
- B. Product Data: For each type of framing and glass including manufacturer recommended installation instructions.
- C. Shop Drawings: Include plans, elevations, sections, details, attachment to other work.
- D. Samples: For each exposed finish.

1.4 INFORMATION SUBMITTALS

- A. Product Test Reports: Indicating compliance with requirements
- B. Warranty: Sample of finish warranty

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Section 01 77 00 Closeout Procedures.
- B. Maintenance data.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver materials to the project site with the manufacturer's UL Listed Labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations provided by manufacturer. Do not install products stored in conditions outside manufacturer's recommended limits.

1.7 WARRANTY

- A. Workmanship Warranty: All materials shall be warranted against defects for a period of 1 year for the date of receipt at the project site. Provide certificates of manufacturer's standard limited warranty with closeout documents.
- B. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Basis of Design:
 - 1. Subject to compliance with requirements, provide products by the following:
 - a. Total Security Solutions, Inc., 935 Garden Lane, Fowlerville, MI 48836, 866 734-6277. Attn: Sales Department, sales@tssbulletproof.com. Web: www.tssbulletproof.com.
 - 2. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved in accordance with Section 01 25 00 Substitution Procedures and Owner's approval.
- B. Design Performance:
 - 1. Through the design, manufacturing techniques and material application the TSS Aluminum Voice Around Transaction Window shall be of the "non-ricochet" type. This design is intended to permit the capture and retention of an attacking projectile

lessening the potential of a random injury or lateral penetration. This design shall employ a spacer within the frame to allow for natural sound transmission.

2. Each transaction position may have a stainless steel dip tray as shown on the drawings.
 3. All vision panels shall be cut to size with all exposed edges polished.
 4. Necessary holes shall be pre-drilled and tapped where required.
 5. Stainless Steel assembly screws and acrylic spacers shall be provided.
 6. Provide anchor screws as required to install equipment.
- C. Field alterations to the construction of the assembly fabricated under the acceptable standards are not allowed unless approved in writing by the manufacturer and the Architect.
- D. Standard manufacturing tolerances +/- 1/16" shall be maintained.
- E. Materials shall meet or exceed UL 752 requirements.

2.2 PERFORMANCE CRITERIA

A. Ballistic Resistant:

1. Level 3 in accordance with UL 752 – Testing for Ballistic Resistance for the complete assembly including framing, glazing and panels.

2.3 FABRICATION

- A. Aluminum sections to be manufactured in accordance with ASTM B209, Extruded aluminum alloy 6063 T5 Anodized to match the existing décor and be free of sharp edges or burrs when in place.
- B. Glazing Channel: U-Channel specifically designed for securing transparencies tightly in place. Angles and stops are only acceptable for top attachment. All exposed aluminum edges shall be clean cut and have no burrs. Exposed corners shall be rounded and sanded.
- C. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members

2.4 FRAME FINISH

- A. Factory-applied finish:
 - 1. Clear Anodic Finish: Architectural Class I, clear coating AA-M10C22A41
Mechanical Finish Chemical Finish: etched, medium matte; 0.70 mils minimum
complying with AAMA 611 "Voluntary Specification for Anodized Architectural
Aluminum"
 - 2. The bottom of the glazing to be capped with corresponding material on the
frame.

2.5 GLAZING

- A. Glazing shall be as shown on the drawings and as specified separately in 08 80 00
Glazing.
 - 1. Bullet Resistant Level 3
1 1/4" All Poly 1250
- B. Acrylic: All acrylic pieces shall meet or exceed UL 752 testing for ballistic integrity.
All edges of acrylic shall be filed, sanded after cutting to remove rough edges and
then polished until "water clear" transparent. All through holes for fasteners shall be
3/8" in diameter and be drilled clean. Chipped edges at through-hole exit points are
not acceptable. All acrylic pieces shall be supported in the proper glazing channel
designed for this purpose (see aluminum, Section D).
- C. Glazing gaskets:
 - 1. Interior: Closed cell neoprene.
 - 2. Exterior: Solid neoprene.

2.6 ACCESSORIES

- A. Anchors: Fully concealed manufacturer recommended.
- B. Mounting plates and connecting clips shall be fabricated from 1/8" thick clear
polycarbonate.
- C. Cash Tray:
 - 1. Location: Recessed.

2. Finish: Brushed Stainless Steel #4 finish.
 3. Material: 18 gauge stainless steel.
 4. Dimensions: 16" x 8" from the outside edge of flanges with a clear opening.
- D. Provide a 1-1/2" thick counter to accommodate recessed cash tray. Counter shall be full width of window, 18" deep, under the glazing and covered with Stainless steel 18 gauge #4 finish.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to beginning installation, verify that all supports have been installed as required by the Contract Documents and architectural drawings, and Shop Drawings have been approved.
- B. Notify Architect of any unsatisfactory preparation that is responsibility of others.
- C. Clean and prepare all surfaces per manufacturers recommendations as required for achieving the best results for the substrate under the project conditions.
- D. Verify field dimensions of openings prior to fabrication of framing.
- E. Coordinate structural requirements to ensure proper attachment and support.
- F. Do not begin installation of material until all unsatisfactory conditions have been resolved and approved by Architect.

3.2 INSTALLATION

- A. Do not begin installation until openings have been verified and surfaces properly prepared in accordance with Drawings.
- B. Install in accordance with manufacturer's instructions and UL 752. Set all equipment plumb.
- C. All products shall be installed per installation instructions provided by manufacturer.
- D. Security window units shall arrive on site completely pre-fabricated to field dimensions approved by Shop Drawings.
- E. Install framing and secure to structure in accordance with manufacturer's recommendations and approved shop drawings.

- F. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- G. Apply sealant in accordance with window and sealant manufacturer's recommendations as indicated in installation instructions.
- H. Remove excess sealant and leave exposed surfaces clean and smooth

3.3 PROTECTION

- A. Clean and protect windows from damage during ongoing construction operations. If damage occurs, remove and replace as required to provide windows in their original, undamaged condition.
- B. Inspection and Cleaning: Verify installation is complete and complies with manufacturer's requirements.
- C. Provide final cleaning of product and accessories, removing excess sealant, labels and protective covers.
- D. Touch-up, repair or replace damaged products prior to Substantial Completion.

END OF SECTION

SECTION 08 56 53.25 – BULLET RESISTANT FRAMING SYSTEM

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Bullet resistant 2.5 aluminum ballistic channel.

1.2 REFERENCES

- A. Underwriters Laboratory UL 752-Standard for Bullet Resisting Equipment.
- B. ASTM C 1172 - Standard Specification for Laminated Architectural Flat Glass.
- C. ASTM B 209 - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
- D. ASTM B 221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.3 ACTION SUBMITTALS

- A. Refer to Section 01 33 00 Submittal Procedures.
- B. Product Data: For each type of framing and glass including manufacturer recommended installation instructions.
- C. Shop Drawings: Include plans, elevations, sections, details, attachment to other work.
- D. Samples: For each exposed finish.

1.4 INFORMATION SUBMITTALS

- A. Product Test Reports: Indicating compliance with requirements
- B. Warranty: Sample of finish warranty

1.5 CLOSEOUT SUBMITTALS

- A. Refer to Section 01 77 00 Closeout Procedures.
- B. Maintenance data.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Refer to Section 01 60 00 Product Requirements.
- B. Deliver materials to the project site with the manufacturer's UL Listed Labels intact and legible. Handle the materials with care to prevent damage. Store materials inside and under cover, stack flat and off floor. Project conditions (temperature, humidity, and ventilation) shall be within the maximum limit recommendations provided by manufacturer. Do not install products stored in conditions outside manufacturer's recommended limits.

1.7 WARRANTY

- A. Workmanship Warranty: All materials shall be warranted against defects for a period of 1 year for the date of receipt at the project site. Provide certificates of manufacturer's standard limited warranty with closeout documents.
- B. Finish Warranty: Manufacturer's warranty against deterioration of factory finishes for the period of 5 years from the date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

- A. Basis of Design:
 - 1. Subject to compliance with requirements, provide products by the following:
 - a. Total Security Solutions, Inc., 935 Garden Lane, Fowlerville, MI 48836, 866 734-6277. Attn: Sales Department, sales@tssbulletproof.com. Web: www.tssbulletproof.com.
 - 2. Subject to compliance with requirements, manufacturers of products of equivalent design may be acceptable if approved in accordance with Section 01 25 00 Substitution Procedures and Owner approval.
- B. Design Performance:
 - 1. Total Security Solutions Bullet Resistant Aluminum Sash TSS-BL2.5 Ballistic Channel.
 - 2. Head and sill shall be one piece extrusions with no integral weep system at the sill.
 - 3. Jambs shall be two piece extrusions with removable faces to allow for re-glazing.
 - 4. All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members.

5. Glazing must not be removable from the threat side of the sash.
 6. Provide to dimension heights and widths indicated on the Drawings.
 7. System shall be designed to defeat ballistic assaults from a .44 magnum handgun in accordance with UL 752, Level 3.
- C. Field alterations to the construction of the assembly fabricated under the acceptable standards are not allowed unless approved in writing by the manufacturer and the Architect.
- D. Standard manufacturing tolerances +/- 1/16" shall be maintained.
- E. Materials shall meet or exceed UL 752 requirements.

2.2 PERFORMANCE CRITERIA

A. Ballistic Resistant:

1. Level 3 in accordance with UL 752 – Testing for Ballistic Resistance for the complete assembly including framing, glazing and panels.

2.3 FABRICATIONS

- A. Aluminum sections to be manufactured in accordance with ASTM B209, Extruded aluminum alloy 6063 T5 Anodized to match the existing décor and be free of sharp edges or burrs when in place.
- B. Glazing Channel: U-Channel specifically designed for securing transparencies tightly in place. Angles and stops are only acceptable for top attachment. All exposed aluminum edges shall be clean cut and have no burrs. Exposed corners shall be rounded and sanded.
- C. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members

2.4 FRAME FINISH

A. Factory-applied finish:

1. Clear Anodic Finish - Satin: Architectural Class I, clear coating AA-M10C22A41
Mechanical Finish Chemical Finish: etched, medium matte; 0.70 mils minimum

complying with AAMA 611 "Voluntary Specification for Anodized Architectural Aluminum"

2. The bottom of the glazing to be capped with corresponding material on the frame.

2.5 GLAZING

- A. Glazing shall be as shown on the drawings and as specified separately in 08 80 00 Glazing.
 1. Bullet Resistant Level 3
1 1/4" All Poly 1250
- B. Acrylic: All acrylic pieces shall meet or exceed UL 752 testing for ballistic integrity. All edges of acrylic shall be filed, sanded after cutting to remove rough edges and then polished until "water clear" transparent. All through holes for fasteners shall be 3/8" in diameter and be drilled clean. Chipped edges at through-hole exit points are not acceptable. All acrylic pieces shall be supported in the proper glazing channel designed for this purpose (see aluminum, Section D).
- C. Glazing gaskets:
 1. Interior: Closed cell neoprene.
 2. Exterior: Solid neoprene.

2.6 ACCESSORIES

- A. Anchors: Fully concealed manufacturer recommended.
- B. Mounting plates and connecting clips shall be fabricated from 1/8" thick clear polycarbonate.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Prior to beginning installation, verify that all supports have been installed as required by the Contract Documents and architectural drawings, and Shop Drawings have been approved.
- B. Notify Architect of any unsatisfactory preparation that is responsibility of others.
- C. Clean and prepare all surfaces per manufacturers recommendations as required for achieving the best results for the substrate under the project conditions.

- D. Verify field dimensions of openings prior to fabrication of framing.
- E. Coordinate structural requirements to ensure proper attachment and support.
- F. Do not begin installation of material until all unsatisfactory conditions have been resolved and approved by Architect.

3.2 INSTALLATION

- A. Do not begin installation until openings have been verified and surfaces properly prepared in accordance with Drawings.
- B. Install in accordance with manufacturer's instructions and UL 752. Set all equipment plumb.
- C. All products shall be installed per installation instructions provided by manufacturer.
- D. Security window units shall arrive on site completely pre-fabricated to field dimensions approved by Shop Drawings.
- E. Install framing and secure to structure in accordance with manufacturer's recommendations and approved shop drawings.
- F. Provide required support and securely fasten and set windows plumb, square, and level without twist or bow.
- G. Apply sealant in accordance with window and sealant manufacturer's recommendations as indicated in installation instructions.
- H. Remove excess sealant and leave exposed surfaces clean and smooth

3.3 PROTECTION

- A. Clean and protect windows from damage during ongoing construction operations. If damage occurs, remove and replace as required to provide windows in their original, undamaged condition.
- B. Inspection and Cleaning: Verify installation is complete and complies with manufacturer's requirements.
- C. Provide final cleaning of product and accessories, removing excess sealant, labels and protective covers.
- D. Touch-up, repair or replace damaged products prior to Substantial Completion.

END OF SECTION

SECTION 08 71 00 – DOOR HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes: Finish Hardware for door openings as otherwise specified herein.
 - 1. Door hardware for steel (hollow metal) doors
 - 2. Door hardware for Ballistic steel (hollow metal) doors (DHM)
 - 3. Door hardware for wood doors
 - 4. Keyed cylinders as indicated.
- B. Related Sections
 - 1. Division 6: Rough Carpentry
 - 2. Division 8: Hollow Metal Doors and Frames
 - 3. Division 8: Flush Wood Doors
 - 4. Division 8: Detention Doors and Frames
 - 5. Division 8: Detention Hardware
 - 6. Division 26: Electrical
- C. References: Comply with applicable requirements of the following standards. Where these standards conflict with other specific requirements, the most restrictive shall govern.
 - 1. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.
 - 2. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2019.
 - 3. BHMA A156.1 - Standard for Butts and Hinges 2021.
 - 4. BHMA A156.2 - Bored and Preassembled Locks and Latches 2017.
 - 5. BHMA A156.3 - Exit Devices 2020.
 - 6. BHMA A156.4 - Door Controls - Closers 2019.
 - 7. BHMA A156.5 - Cylinders and Input Devices for Locks 2020.
 - 8. BHMA A156.6 - Standard for Architectural Door Trim 2021.
 - 9. BHMA A156.7 - Template Hinge Dimensions 2016.
 - 10. BHMA A156.8 - Door Controls - Overhead Stops and Holders 2021.
 - 11. BHMA A156.13 - Mortise Locks & Latches Series 1000 2017.
 - 12. BHMA A156.15 - Release Devices - Closer Holder, Electromagnetic and Electromechanical 2021.
 - 13. BHMA A156.16 - Auxiliary Hardware 2018.
 - 14. BHMA A156.18 - Materials and Finishes 2020.
 - 15. BHMA A156.19 - Power Assist and Low Energy Power Operated Swinging Doors 2019.
 - 16. BHMA A156.21 - Thresholds 2019.
 - 17. BHMA A156.22 - Standard for Gasketing 2021.
 - 18. BHMA A156.23 - Electromagnetic Locks 2017.
 - 19. BHMA A156.25 - Electrified Locking Devices 2018.
 - 20. BHMA A156.26 - Standard for Continuous Hinges 2021.
 - 21. BHMA A156.28 - Recommended Practices For Mechanical Keying Systems 2018.
 - 22. BHMA A156.30 - High Security Cylinders 2020.

23. BHMA A156.31 - Electric Strikes and Frame Mounted Actuators 2019.
24. BHMA A156.36 - Auxiliary Locks 2020.
25. BHMA A156.115 - Hardware Preparation In Steel Doors And Steel Frames 2016.
26. BHMA A156.115W - Hardware Preparation in Wood Doors with Wood or Steel Frames 2006.
27. DHI (H&S) - Sequence and Format for the Hardware Schedule 2019.
28. DHI (KSN) - Keying Systems and Nomenclature 2019.
29. DHI (LOCS) - Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames 2004.
30. DHI WDHS.3 - Recommended Locations for Architectural Hardware for Flush Wood Doors 1993; also in WDHS-1/WDHS-5 Series, 1996.
31. ICC (IBC) - International Building Code, 2021 Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
32. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.
33. ISO 9001 - Quality management systems -- Requirements 2015.
34. ITS (DIR) - Directory of Listed Products Current Edition.
35. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
36. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2022.
37. NFPA 101 - Life Safety Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.
38. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2022.
39. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2022.
40. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.
41. UL 437 - Standard for Key Locks Current Edition, Including All Revisions.
42. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

D. Intent of Hardware Groups

1. Should items of hardware not specified be required for completion of the Work, furnish such items of type and quality comparable to adjacent hardware and appropriate for service required.
2. Where items of hardware aren't specified, are required for completion of the Work, a written statement of such discrepancy to be submitted to Architect, prior to date specified for receipt of bids for clarification by addendum; or furnish such items in the type and quality established by this specification, and appropriate to the service intended.
3. The door hardware contractor shall bid and in construction submit coordinated hardware and components that are required but not defined within the hardware set. The owner has County Standards and pre-approved manufacturers listed below.

1.2 SUBSTITUTIONS

- A. No substitutions are permitted. Components within a preapproved manufacturer may be substituted to better capture the requirements of the set.

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: Shall be 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.

F. 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.

1.4 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. Automatic Operator Supplier Qualifications: Power operator products and accessories are required to be supplied and installed through current members of the manufacturer's "Power Operator Preferred Installer" program. Suppliers are to be factory trained, certified, and a direct purchaser of the specified power operators and be responsible for the installation and maintenance of the units and accessories indicated for the Project.

F. 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.

G. Each unit to bear third party permanent label demonstrating compliance with the referenced standards.

H. 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.
- I. 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), Contractor(s), Owner, and Architect to confirm hardware sets and components, review proper methods and 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.
- J. At completion of installation, provide written documentation that components were applied to manufacturer's instructions and recommendations and according to approved schedule.

1.5 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".

1.6 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 Hardware and Electrical Connections: Coordinate the layout and installation of scheduled electrified door hardware and related access control equipment with required connections to source power junction boxes, low voltage power supplies, detection and monitoring hardware, and fire and detection alarm systems.

- C. 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.

1.7 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. Standard Warranty Period: Two years from date of Substantial Completion, unless otherwise indicated.
- D. Special Warranty Periods:
1. Ten years for mortise locks and latches.
 2. Five years for exit hardware.
 3. Twenty five years for manual overhead door closer bodies.
 4. Five years for motorized electric latch retraction exit devices.
 5. Two years for electromechanical door hardware, unless noted otherwise.

1.8 MAINTENANCE

- 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 MANUFACTURERS

- A. The following manufacturers are approved subject to compliance with requirements of the Contract Documents.

<u>Item:</u>	<u>Manufacturer:</u>
Hinges	Stanley
Continuous Hinges	Stanley
Locksets	Marks USA, Schlage
Cylinders	Medeco

Exit Devices	Marks, Schlage
Closers	Corbin Russwin DC6210-N54
Push/ Pull Plates	Don-Jo
Push/ Pull Bars	Don-Jo
Protection Plates	Don-Jo
Overhead Stops	Don-Jo
Door Stops	Don-Jo
Flush Bolts	Don-Jo
Coordinator & Brackets	Don-Jo
Threshold & Gasket	National Guard

2.2 MATERIALS

1. Hinges:

1. Template screw hole locations
2. Minimum of 2 permanently lubricated non-detachable bearings
3. Equip with easily seated, non-rising pins
4. Sufficient size to allow 180-degree swing of door
5. Furnish hinges with five knuckles and flush [concealed] bearings
6. Provide hinge type as listed in schedule.
7. Furnish 3 hinges per leaf to 7 foot 6 inch height. Add one for each additional 30 inches in height or fraction thereof.
8. Tested and approved by BHMA for all applicable ANSI Standards for type, size, function and finish
9. UL10C listed for Fire rated doors.

2. Geared Continuous Hinges:

1. Tested and approved by BHMA for ANSI A156.26-1996 Grade 1
2. Anti-spinning through fastener
3. ULIOC listed for 3 hour Fire rating
4. Non-handed
5. Lifetime warranty
6. Provide Fire Pins for 3-hour fire ratings
7. Sufficient size to permit door to swing 180 degrees

3. Electrified Functions for Hinges: Comply with the following:

1. Power transfer: concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle. Provide wire quantity and sizes required for electric hardware to be served.
2. Monitoring: concealed electrical monitoring switch.
3. Power transfer and monitoring: concealed PTFE-jacketed wires, secured at each leaf and continuous through hinge knuckle, and with concealed electrical monitoring switch.

4. Mortise Type Locks and Latches:

1. Tested and approved by BHMA for ANSI A156.13, Series 1000, Operational Grade 1, Extra— Heavy Duty, Security Grade 2 and be UL10C.
2. Furnish UL or recognized independent laboratory certified mechanical operational testing to 4 million cycles minimum.
3. Provide 9001—Quality Management and 14001—Environmental Management.
4. Fit ANSI A115.1 door preparation
5. Functions and design as indicated in the hardware groups
6. Solid, one—piece, 3/4—inch (19mm) throw, antifriction latchbolt made of self-lubricating stainless

- steel
 - 7. Deadbolt functions shall have 1 inch (25mm) throw bolt made of hardened stainless steel
 - 8. Latchbolt and Deadbolt are to extend into the case a minimum of 3/8 inch (9.5mm) when fully extended
 - 9. Auxiliary deadlatch to be made of one piece stainless steel, permanently lubricated
 - 10. Provide sufficient curved strike lip to protect door trim
 - 11. Lever handles must be of forged or cast brass, bronze or stainless-steel construction and conform to ANSI A117.1. Levers that contain a hollow cavity are not acceptable
 - 12. Lock shall have self—aligning, thru—bolted trim
 - 13. Levers to operate a roller bearing spindle hub mechanism
 - 14. Mortise cylinders of lock shall have a concealed internal setscrew for securing the cylinder to the lockset. The internal setscrew will be accessible only by removing the core, with the control key, from the cylinder body.
 - 15. Spindle to be designed to prevent forced entry from attacking of lever
 - 16. Provide locksets with 7-pin removable and interchangeable core cylinders
 - 17. Each lever to have independent spring mechanism controlling it
 - 18. Core face must be the same finish as the lockset.
5. Cylindrical Type Locks and Latches:
- a. Tested and approved by BHMA for ANSI A156.2, Series 4000, Operational Grade 1, Extra-Heavy Duty, and be ULIOC listed.
 - b. Provide 9001-Quality Management and 14001-Environmental Management.
 - c. Fit modified ANSI A115.2 door preparation.
 - d. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 - e. Locksets to have anti-rotational studs that are thru-bolted
 - f. Keyed lever shall not have exposed “keeper” hole
 - g. Each lever to have independent spring mechanism controlling it
 - h. 2-3/4 inch (70 mm) backset
 - i. 9/16 inch (14 mm) throw latchbolt
 - j. Provide sufficient curved strike lip to protect door trim
 - k. Outside lever sleeve to be seamless, of one-piece construction made of a hardened steel alloy
 - l. Keyed lever to be removable only after core is removed, by authorized control key
 - m. Provide locksets with 7-pin removable and interchangeable core cylinders
 - n. Hub, side plate, shrouded rose, locking pin to be a one-piece casting with a shrouded locking lug.
 - o. Locksets outside locked lever must withstand minimum 1400 inch pounds of torque. In excess of that, a replaceable part will shear. Key from outside and inside lever will still operate lockset.
 - p. Core face must be the same finish as the lockset.
 - q. Functions and design as indicated in the hardware groups.
6. Cylindrical Grade 2 Type Locks and Latches:
- a. Certified by BHMA for ANSI A156.3, Series 4000, Operational Grade 2.
 - b. Fit modified ANSI A115.3 door preparation
 - c. Locksets and cores to be of the same manufacturer to maintain complete lockset warranty
 - d. 2-3/4 inch (70mm) backset, or 2 3/8 inch backset as needed
 - e. 1/2 inch (14mm) throw latchbolt
 - f. Provide locksets with 7-pin code.

- g. Functions and design as indicated in the hardware groups
7. Exit Devices:
- a. Exit devices to meet or exceed BHMA for ANSI 156.3, Grade 1.
 - b. Exit devices to be tested and certified by UL or by a recognized independent laboratory for mechanical operational testing to 9 million cycles minimum with inspection confirming Grade 1 Loaded Forces have been maintained.
 - c. Exit devices chassis to be investment cast steel, zinc dichromate.
 - d. Exit devices to have stainless steel deadlocking 3/4" through latch bolt.
 - e. Exit devices to be equipped with sound dampening on touchbar.
 - f. Non-fire rated exit devices to have cylinder dogging.
 - g. Non-fire rated exit devices to have 1/4" minimum turn hex key dogging.
 - h. Touchpad to be "T" style constructed of architectural metal with matching metal end caps.
 - i. Touchbar assembly on wide style exit devices to have a 1/4" clearance to allow for vision frames.
 - j. All exposed exit device components to be of architectural metals and "true" architectural finishes.
 - k. Provide strikes as required by application.
 - l. Fire exit hardware to conform to UL10C and UBC 7-2. UL tested for Accident Hazard.
 - m. Exit device to be heavy investment cast stainless steel with black powder coated finish.
 - n. Exit devices to have field reversible handing.
 - o. Provide heavy duty vandal resistant lever rim with heavy duty investment cast stainless steel components and extra strength shock absorbing overload springs. Lever shall not require resetting. Lever design to match locksets and latchsets.
 - p. Provide 9001-Quality Management and 14001 -Environmental Management.
 - q. Vertical Latch Assemblies to have gravity operation, no springs.
8. Cylinders:
- a. Provide the necessary cylinder housings, collars, rings & springs as recommended by the manufacturer for proper installation.
 - b. Provide the proper cylinder cams or tail piece as required to operate all locksets and other keyed hardware items listed in the hardware sets.
 - c. Coordinate and provide as required for related sections.
9. Door Closers:
- a. Tested and approved by BHMA for ANSI 156.4, Grade 1
 - b. UL10C certified
 - c. Provide 9001—Quality Management and 14001-Environmental Management.
 - d. Closer shall have extra—duty arms and knuckles
 - e. Conform to ANSI 117.1
 - f. Maximum 2 7/16 inch case projection with non-ferrous cover
 - g. Separate adjusting valves for closing and latching speed, and backcheck
 - h. Provide adapter plates, shim spacers and blade stop spacers as required by frame and door conditions
 - i. Full rack and pinion type closer with 1 1/2" minimum bore
 - j. Mount closers on non-public side of door, unless otherwise noted in specification
 - k. Closers shall be non-handed, non-sized and multi-sized.
10. Door Stops:

- a. Wall stop and floor stop shall be wrought bronze, brass or stainless steel.
 - b. Provide fastener suitable for wall construction.
 - c. Coordinate reinforcement of walls where wall stop is specified.
 - d. Provide dome stops where wall stops are not practical. Provide spacers or carpet riser for floor conditions encountered
11. Overhead Stops: Provide a Surface mounted or concealed overhead when a floor or wall stop cannot be used or when listed in the hardware set.
- a. Concealed overhead stops shall be heavy duty bronze or stainless steel.
 - b. Surface overhead stops shall be heavy duty bronze or stainless steel.
12. Push Plates: Provide with four beveled edges ANSI J301, .050 thickness, size as indicated in hardware set. Furnish oval-head countersunk screws to match finish.
13. Pulls with Plates: Provide with four beveled edges ANSI J301, .050 thickness plates with ANSI J401 Pull as listed in hardware set. Provide proper fasteners for door construction.
14. Push/ Pull Bars: Provide ANSI J504, 1" Dia. Pull and push bar model and series as listed in hardware set. Provide proper fasteners for door construction.
15. Kickplates: Provide with four beveled edges ANSI J102, 10 inches high by width less 2 inches on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
16. Mop Plates: Provide with four beveled edges ANSI J103, 4 inches high by width less 1 inch on single doors and 1 inch on pairs of doors. Furnish oval-head countersunk screws to match finish.
17. Door Bolts: Flush bolts for wood or metal doors.
- a. Provide a set of Automatic bolts, Certified ANSI/BHMA 156.3 Type 25 for hollow metal label doors.
 - b. Provide a set of Automatic bolts, Certified ANSUBHMA 156.3 Type 27 at wood label doors.
 - c. Manual flush bolts, Certified ANSI/BHMA 156.16 at openings where allowed local authority.
 - d. Provide Dust Proof Strike, Certified ANSI/BHMA 1J6.16 at doors with flush bolts without thresholds.
18. Coordinator and Brackets: Provide a surface mounted coordinator when automatic bolts are used in the hardware set.
- a. Coordinator, Certified ANSI/BHMA A1156.3 Type 2IA for full width of the opening.
 - b. Provide mounting brackets for soffit applied hardware.
 - c. Provide hardware preparation (cutouts) for latches as necessary.
19. Power Supply:
- a. Provide power supply for (ELR) Electric Latch Retraction exit devices
 - i. Motherboard will accept up to four plug—in Control Modules. Provide the appropriate necessary control module to operate the number of ELR exit devices used at

- each opening. The Control Module shall include a Time delay Feature, variable (0-4 minutes) latch retraction period in response to a momentary input.
 - ii. UL Listed for class II output
 - iii. Include circuit breakers for protection of motherboard
 - iv. 115 or 230 Volt user selectable switch, with AC input = 115 Volt at 1 Amp
 - v. Control module shall include Fire alarm terminal and Auxiliary contacts for remote signaling.
 - vi. Optional card for Battery Backup (BT) power tap module to operate a Card reader or when ELR devices require battery backup (Lead Acid Batteries are not included and is to be furnished by others)
- b. Provide power supply that is UL Listed, Field Selectable 12VDC or 24VDC output. The power supply will be specifically designed to support electric locks and access controls. The power supply uses 115 VAC at 800mA input. The power shall be able to be expanded to four station controls. The filtered and regulated output power is field selectable for 12 or 24 VDC.
- i. Fire Alarm/Life Safety emergency release included in power supply.
 - ii. Available options for multiple door options four or more control stations, Adjustable Time delay relay, Battery charging, Battery Backup.
20. Power Transfer: Power transfer device shall be a steel housing and flexible tube. Secure and inconspicuous channel is to bring power from the frame to the door.
- a. Precision EPT-5
 - b. Tube shall accept up to 5/16" wire bundle and accommodate a door swing of 120 Deg.
 - c. Wires as required by others
21. Surface Mounted Door Loop Power Transfer: Armored flex conduit is to bring power from the frame to the door. The tube shall accept up to 1/4" wire bundle and is 18" long.
- a. Precision EPT-2
 - b. Wires as required by others.
22. Electric Door Strike: Certified by ANSI/BHMA 1J6.31, Grade 1. and listed for Burglary Protection ANSI/ ULI034 Grade 1.
- a. For General use provide fail-secure electric strike and with fire-rated device.
 - b. Listed UL10C for Fire Door assemblies
 - c. Latchbolt monitor switch option when specified in hardware sets.
 - d. Provide the electric strike in the appropriate model that will accept a 5/8" or 3/4" latchbolt.
23. Door Position Switch: Provided by Security Contractor for door status monitoring as indicated in hardware sets.
- a. At all fired rated doors the door and frames, position switch preparation will be provided by the door and frame manufacturer or by an authorized label service agent.
24. Seals: All seals shall be finished to match adjacent frame color. Seals shall be furnished as listed in schedule. Material shall be UL listed for labeled openings.
25. Weatherstripping: Provide at head and jambs only those units where resilient or flexible-seal strip is easily replaceable. Where bar-type weatherstrip is used with parallel arm mounted closers install weatherstrip first.

- a. Weatherstrip shall be resilient seal of Silicone
 - b. UL10C Positive Pressure rated seal set when required.
26. Door Bottom/ Sweeps: Surface mounted or concealed door bottom where listed in the hardware sets.
- a. Door seal shall be resilient seal of Silicone
 - b. UL10C Positive Pressure rated seal set when required.
27. Thresholds: Thresholds shall be aluminum beveled type with maximum height of 1/2" for conformance with ADA requirements. Furnish as specified and per details. Provide fasteners and screws suitable for floor conditions.
28. Key Cabinet: Provide one wall mounted Telkee, Lund or MMF series key cabinet complete with hooks, index and tags to accommodate 50% expansion. Coordinate mounting location with architect.
29. Silencers: Furnish silencers on all interior frames, 3 for single doors, 2 for pairs. Omit where any type of seals occur.

3.3 FINISH

- A. Designations used in Schedule of Finish Hardware - 3.05, and elsewhere to indicate hardware finishes are those listed in ANSI/BHMA A156.18 including coordination with traditional U.S. finishes shown by certain manufacturers for their products
- B. Powder coat door closers to match other hardware, unless otherwise noted.
- C. Aluminum items shall be finished to match predominant adjacent material. Seals to coordinate with frame color.

3.4 KEYS AND KEYING

- A. Provide keyed brass construction cores and keys during the construction period. Construction control and operating keys and core shall not be part of the Owner's permanent keying system or furnished in the same keyway (or key section) as the Owner's permanent keying system. Permanent cores and keys (prepared according to the accepted keying schedule) will be furnished to the Owner.
- B. Cylinders, removable and interchangeable core system: MEDECO.
- C. Permanent keys and cores: stamped with the applicable key mark for identification. These visual key control marks or codes will not include the actual key cuts. Permanent keys will also be stamped "Do Not Duplicate."
- D. Transmit Grand Masterkeys, Masterkeys, and other Security keys to Owner by Registered Mail, return receipt requested.
- E. Furnish Keys in the following quantities:
 - 1. 1 each Grand Masterkeys
 - 2. 4 each Masterkeys
 - 3. 2 each Change keys each keyed core
 - 4. 15 each Construction masterkeys

- 5. 1 each Control keys
- F. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Hardware Supplier. Construction cores and keys remain the property of the Hardware Supplier.
- G. Keying Schedule: Arrange for a keying meeting, and programming meeting with Architect Owner and hardware supplier, and other involved parties to ensure locksets and locking hardware, are functionally correct and keying and programming complies with project requirements. Furnish 3 typed copies of keying and programming schedule to Architect.

PART 3 – EXECUTION

3.1 EXAMINATION

- A. Verification of conditions: Examine doors, frames, related items and conditions under which Work is to be performed and identify conditions detrimental to proper and or timely completion.
 - a. Do not proceed until unsatisfactory conditions have been corrected.

3.2 HARDWARE LOCATIONS

- A. Mount hardware units at heights indicated in the following publications except as specifically indicated or required to comply with the governing regulations.
 - 1. Recommended Locations for Builder's Hardware for Standard Steel Doors and Frames, by the Door and Hardware Institute (DHI).
 - 2. Recommended locations for Architectural Hardware for flush wood doors (DHI).
 - 3. WDMA Industry Standard I.S.-IA-04, Industry Standard for Architectural wood flush doors.

3.3 INSTALLATION

- A. Install each hardware item per manufacturer's instructions and recommendations. Do not install surface mounted items until finishes have been completed on the substrate. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.
- B. Conform to local governing agency security ordinance.
- C. Install Conforming to ICC/ANSI A117.1 Accessible and Usable Building and Facilities.
 - 1. Adjust door closer sweep periods so that from the open position of 70 degrees, the door will take at least 3 seconds to move to a point 3 inches from the latch, measured to the landing side of the door.
- D. Installed hardware using the manufacturers fasteners provided. Drill and tap all screw holes located in metallic materials. Do not use "Riv-Nuts" or similar products.

3.4 FIELD QUALITY CONTROL AND FINAL ADJUSTMENT

- A. Contractor/installers, Field Services: After installation is complete, contractor shall inspect the completed door openings on site to verify installation of hardware is complete and properly adjusted, in accordance with both the Contract Documents and final shop drawings.
1. Check and adjust closers to ensure proper operation.
 2. Check latchset, lockset, and exit devices are properly installed and adjusted to ensure proper operation.
 - i. Verify levers are free from binding.
 - ii. Ensure latchbolts and dead bolts are engaged into strike and hardware is functioning.
 4. Report findings, in writing, to architect indicating that all hardware is installed and functioning properly. Include recommendations outlining corrective actions for improperly functioning hardware if required.

3.5 SCHEDULE OF FINISH HARDWARE

Manufacturer List:

<u>Code</u>	<u>Name</u>
BY	By Related Section
CR	Corbin Russwin
DJ	Don-Jo
MA	Marks
MD	Medeco
NA	National Guard
ST	Stanley
BO	By Owner/ Others

Finish List:

<u>Code</u>	<u>Description</u>
15	Satin Nickel Plate
28	Aluminum Anodized (Clear)
32D	Satin Stainless Steel
626	Satin Chromium Plated
628	Satin Aluminum, Clear Anodized
630	Satin Stainless Steel
689	Aluminum Painted
AL	Aluminum
CL	Clear
US32D	Stainless Steel, Dull

Hardware Sets

Set 1 – Interior - Access Control – CR on one side – Ballistic: DHM/DHF
Door: 1

2	Hinges	By HDW Contractor	US26D	ST
1	Elect. Hinges	By HDW Contractor	US26D	ST
1	Elect Strike Mortise Lock	195RAB/26D	626	MA
1	Card Reader	Furnished and Installed by the Security Contractor		BO
1	Core	By HDW Contractor	626	MD
1	Closer	By HDW Contractor	689	CR
3	Door Silencers	By HDW Contractor		DJ
1	Wall Bumper	By HDW Contractor	626	DJ
1	Harness	By HDW Contractor		ST
1	Wiring Diagram	Furnished by Hardware Supplier		BY
1	Power Transfer	By HDW Contractor		BY
1	Door Position Switch	By HDW Contractor	WHITE	BY
2	Backup Battery	By HDW Contractor		BY
1	Harness	By HDW Contractor		ST
1	Power Supply	By HDW Contractor		BY
1	Gasketing	By HDW Contractor		BY
1	Kick plate	By HDW Contractor		DJ

Set 2 – Corridor - Access Control – CR on one Side: HMD/HMF
Door: 2

2	Hinges	By HDW Contractor	US26D	ST
1	Elect. Hinges	By HDW Contractor	US26D	ST
1	Elect Strike Mortise Lock	195RDW/26D	626	MA
1	Card Reader	Furnished and Installed by the Security Contractor		BO
1	Core	By HDW Contractor	626	MD
1	Closer	By HDW Contractor	689	CR
3	Door Silencers	By HDW Contractor		DJ
1	Wall Bumper	By HDW Contractor	626	DJ
1	Harness	By HDW Contractor		ST
1	Wiring Diagram	Furnished by Hardware Supplier		BY
1	Power Transfer	By HDW Contractor		BY
1	Door Position Switch	By HDW Contractor	WHITE	BY
2	Backup Battery	By HDW Contractor		BY
1	Harness	By HDW Contractor		ST
1	Power Supply	By HDW Contractor		BY

Set 3 – Private Office WDD/HMF
Doors: 3, 4, 5

3	Hinge	By HDW Contractor	32D	ST
1	Entry Lock	195RAB/26D	630	MA
1	Cylinder Core	By HDW Contractor	626	MD
1	Closer	By HDW Contractor	689	CR
1	Wall Bumper	By HDW Contractor	626	DJ
1	Overhead Stop	By HDW Contractor	689	DJ
1	Coat Hook	By HDW Contractor	630	DJ

1	Sound Gasketing	By HDW Contractor @ Head & Jambs		BY
1	Threshold	By HDW contractor	AL	NA

Set 4 – Existing Ext. AL SF – Access Control, CR on Ext, Monitored w/Remote Buzzer

Doors: Existing AD373

1	Card Reader	Furnished and Installed by the Security Contractor		BO

OPERATION DESCRIPTION: Door normally closed 24/7. Card Reader or mechanical key will momentarily release lock. Egress from interior controlled remotely by Security Control Room.

END OF SECTION 08 71 00

SECTION 08 80 00 - GLAZING

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.
- B. 08 11 13 – Hollow Metal Doors and Frames
- C. 08 56 69 – Bullet Resistant Aluminum Transoms Windows

1.2 SUMMARY

- A. Section includes glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section:
 - 1. Interior side lites in hollow metal framing and doors
 - 2. Bullet Resistant Glazing

1.3 DEFINITIONS

- A. Glass Manufacturers: Firms that produce primary glass, fabricated glass, or both, as defined in referenced glazing publications.
- B. Glass Thicknesses: Indicated by thickness designations in millimeters according to ASTM C 1036.

1.4 PERFORMANCE REQUIREMENTS

- A. General: Installed glazing systems shall withstand normal thermal movement and wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, or installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

1.5 SUBMITTALS

- A. Product Data: For each glass product and glazing material indicated.
- B. Glass Samples: For each type of the following products; 12 inches (300 mm) square.
- C. Glazing Accessory Samples: For gaskets and sealants in 12-inch (300-mm) lengths.
- D. Glazing Schedule: List glass types and thicknesses for each size opening and location. Use same designations indicated on Drawings.

- E. Qualification Data: For installers manufacturers of insulating-glass units with sputter-coated, low-e coatings glass testing agency.
- F. Product Certificates: For glass and glazing products, from manufacturer.
- G. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for coated glass, insulating glass, glazing sealants, and glazing gaskets.
- H. Preconstruction adhesion and compatibility test report.
- I. Warranties: Sample of special warranties.

1.6 QUALITY ASSURANCE

- A. Installer Qualifications: A qualified installer who employs glass installers for this Project who are certified under the National Glass Association's Certified Glass Installer Program.
- B. Glass Testing Agency Qualifications: A qualified independent testing agency accredited according to the NFRC CAP 1 Certification Agency Program.
- C. Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated.
- D. Source Limitations for Glass: Obtain coated float glass from single source from single manufacturer for each glass type.
- E. Source Limitations for Glazing Accessories: Obtain from single source from single manufacturer for each product and installation method.
- F. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
 - 1. GANA Publications: GANA's "Glazing Manual."
 - 2. AAMA Publications: AAMA GDSG-1, "Glass Design for Sloped Glazing," and AAMA TIR-A7, "Sloped Glazing Guidelines."
 - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, "Guidelines for Sloped Glazing."
 - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, "North American Glazing Guidelines for Sealed Insulating Glass Units for Commercial and Residential Use."
- G. Safety Glazing Labeling: Where safety glazing labeling is indicated, permanently mark glazing with certification label of the SGCCthe manufacturer. Label shall indicate manufacturer's name, type of glass, thickness, and safety glazing standard with which glass complies.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions. Prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

- B. Comply with insulating-glass manufacturer's written recommendations for venting and sealing units to avoid hermetic seal ruptures due to altitude change.

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
 - 1. Do not install glazing sealants when ambient and substrate temperature conditions are outside limits permitted by sealant manufacturer or below 40 deg F (4.4 deg C).

1.9 WARRANTY

- A. Manufacturer's Special Warranty for Coated-Glass Products: Manufacturer's standard form in which coated-glass manufacturer agrees to replace coated-glass units that deteriorate within specified warranty period. Deterioration of coated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning coated glass contrary to manufacturer's written instructions. Defects include peeling, cracking, and other indications of deterioration in coating.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- B. Manufacturer's Special Warranty on Laminated Glass: Manufacturer's standard form in which laminated-glass manufacturer agrees to replace laminated-glass units that deteriorate within specified warranty period. Deterioration of laminated glass is defined as defects developed from normal use that are not attributed to glass breakage or to maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.
 - 1. Warranty Period: 10 years from date of Substantial Completion.
- C. Manufacturer's Special Warranty on Insulating Glass: Manufacturer's standard form in which insulating-glass manufacturer agrees to replace insulating-glass units that deteriorate within specified warranty period. Deterioration of insulating glass is defined as failure of hermetic seal under normal use that is not attributed to glass breakage or to maintaining and cleaning insulating glass contrary to manufacturer's written instructions. Evidence of failure is the obstruction of vision by dust, moisture, or film on interior surfaces of glass.
 - 1. Warranty Period: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 GLASS PRODUCTS, GENERAL

- A. GLAZING SCHEDULE
 - 1. GL-1 clear tempered interior glazing
 - 2. GL-2 Ballistic Level 3 Glazing

- B. Thickness: Where glass thickness is indicated, it is a minimum. Provide glass lites in thicknesses as needed to comply with requirements indicated.
 - 1. Minimum glass thickness for GL-1 interior lites in hollow metal door and frames: Clear tempered glazing not less than ¼" thick.
 - 2. Minimum glass thickness for GL-2 interior ballistic glazing in transaction window: 1.149"
- C. Strength: Where float glass is indicated, provide annealed float glass, Kind HS heat-treated float glass, or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where heat-strengthened glass is indicated, provide Kind HS heat-treated float glass or Kind FT heat-treated float glass as needed to comply with "Performance Requirements" Article. Where fully tempered glass is indicated, provide Kind FT heat-treated float glass.
- D. Thermal and Optical Performance Properties: Provide glass with performance properties specified, as indicated in manufacturer's published test data, based on procedures indicated below:
 - 1. For monolithic-glass lites, properties are based on units with lites 6.0 mm thick
 - 2. For laminated-glass lites, properties are based on products of construction indicated.
 - 3. Visible Reflectance: Center-of-glazing values, according to NFRC 300.

2.2 GLASS PRODUCTS

- A. Float Glass: ASTM C 1036, Type I, Quality-Q3, Class I (clear) unless otherwise indicated.
- B. Glazing Type: GL-1
- C. Heat-Treated Float Glass: ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
 - 1. Fabrication Process: By horizontal (roller-hearth) process with roll-wave distortion parallel to bottom edge of glass as installed unless otherwise indicated.
 - 2. For uncoated glass, comply with requirements for Condition A.
 - 3. For coated vision glass, comply with requirements for Condition C (other coated glass).

2.3 Ballistic Glazing

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Reference Section 08 43 33.13 for ballistic framing systems
- C. Basis of Design: Total Security Solutions, Inc., 935 Garden Lane, Fowlerville, MI 48836, 8866 734-6277. Attn: Sales Department, sales@tssbulletproof.com. Web: www.tssbulletproof.com.
- D. Other manufacturers subject to compliance with requirements and approved by owner and architect:
 - 1. McGrory & Insulguard
 - 2. Or equal as approved by Architect and Owner

E. GLAZING TYPE

1. GL-2 Level 3 ballistic UL 752
2. Tolerances: All joints and connections shall be tight, providing hairline joints and true alignment of adjacent members
3. Product shall meet UL Standard 752 rating level 3
 - a. TSS Polycarbonate LP shall be All Poly 1250 – Level 3, light transmission of 77% with thickness of 1-1/4".

2.4 GLAZING GASKETS

- A. Dense Compression Gaskets: Molded or extruded gaskets of profile and hardness required to maintain watertight seal, made from one of the following:
1. Neoprene complying with ASTM C 864.
 2. EPDM complying with ASTM C 864.
 3. Silicone complying with ASTM C 1115.
 4. Thermoplastic polyolefin rubber complying with ASTM C 1115.
- B. Soft Compression Gaskets: Extruded or molded, closed-cell, integral-skinned neoprene, EPDM, silicone or thermoplastic polyolefin rubber gaskets complying with ASTM C 509, Type II, black; of profile and hardness required to maintain watertight seal.
1. Application: Use where soft compression gaskets will be compressed by inserting dense compression gaskets on opposite side of glazing or pressure applied by means of pressure-glazing stops on opposite side of glazing.
- C. Lock-Strip Gaskets: Neoprene extrusions in size and shape indicated, fabricated into frames with molded corner units and zipper lock-strips, complying with ASTM C 542, black.

2.5 GLAZING SEALANTS

- A. General:
1. Compatibility: Provide glazing sealants that are compatible with one another and with other materials they will contact, including glass products, seals of insulating-glass units, and glazing channel substrates, under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
 2. Suitability: Comply with sealant and glass manufacturers' written instructions for selecting glazing sealants suitable for applications indicated and for conditions existing at time of installation.
 3. Sealants used inside the weatherproofing system, shall have a VOC content of not more than 250 g/L when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
 4. Sealants used inside the weatherproofing system shall comply with the testing and product requirements of the California Department of Health Services' "Standard Practice for the Testing of Volatile Organic Emissions from Various Sources Using Small-Scale Environmental Chambers."
 5. Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range.

- B. Glazing Sealants for Fire-Rated Glazing Products: Products that are approved by testing agencies that listed and labeled fire-resistant glazing products with which they are used for applications and fire-protection ratings indicated.

2.6 GLAZING TAPES

- A. Back-Bedding Mastic Glazing Tapes: Preformed, butyl-based, 100 percent solids elastomeric tape; nonstaining and nonmigrating in contact with nonporous surfaces; with or without spacer rod as recommended in writing by tape and glass manufacturers for application indicated; and complying with ASTM C 1281 and AAMA 800 for products indicated below:
 - 1. AAMA 804.3 tape, where indicated.
 - 2. AAMA 806.3 tape, for glazing applications in which tape is subject to continuous pressure.
 - 3. AAMA 807.3 tape, for glazing applications in which tape is not subject to continuous pressure.
- B. Expanded Cellular Glazing Tapes: Closed-cell, PVC foam tapes; factory coated with adhesive on both surfaces; and complying with AAMA 800 for the following types:
 - 1. AAMA 810.1, Type 1, for glazing applications in which tape acts as the primary sealant.
 - 2. AAMA 810.1, Type 2, for glazing applications in which tape is used in combination with a full bead of liquid sealant.

2.7 MISCELLANEOUS GLAZING MATERIALS

- A. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.
- B. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.
- C. Setting Blocks: Elastomeric material with a Shore, Type A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions of hardness required by glass manufacturer to maintain glass lites in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit glass lateral movement (side walking).
- F. Cylindrical Glazing Sealant Backing: ASTM C 1330, Type O (open-cell material), of size and density to control glazing sealant depth and otherwise produce optimum glazing sealant performance.
- G. Perimeter Insulation for Fire-Resistive Glazing: Product that is approved by testing agency that listed and labeled fire-resistant glazing product with which it is used for application and fire-protection rating indicated.

2.8 FABRICATION OF GLAZING UNITS

- A. Fabricate glazing units in sizes required to fit openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with written instructions of product manufacturer and referenced glazing publications, to comply with system performance requirements.
- B. Clean-cut or flat-grind vertical edges of butt-glazed monolithic lites to produce square edges with slight chamfers at junctions of edges and faces.
- C. Grind smooth and polish exposed glass edges and corners.

2.9 INTERIOR GLAZING

- A. INTERIOR GLAZING - HEAT-TREATED FLOAT GLASS (Unless otherwise noted as Pattern Glass):
 - 1. ASTM C 1048; Type I; Quality-Q3; Class I (clear) unless otherwise indicated; of kind and condition indicated.
- B. GL-2 Interior Glazing
 - 1. Glass Type - Interior: Clear fully tempered float glass.
 - 2. Thickness: 6.0 mm.
 - 3. Provide safety glazing labeling.
 - a. Location: See drawings

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing, glazing channels, and stops, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep systems.
 - 3. Minimum required face and edge clearances.
 - 4. Effective sealing between joints of glass-framing members.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings not firmly bonded to substrates.
- B. Examine glazing units to locate exterior and interior surfaces. Label or mark units as needed so that exterior and interior surfaces are readily identifiable. Do not use materials that will leave visible marks in the completed work.

3.3 GLAZING, GENERAL

- A. Comply with combined written instructions of manufacturers of glass, sealants, gaskets, and other glazing materials, unless more stringent requirements are indicated, including those in referenced glazing publications.
- B. Adjust glazing channel dimensions as required by Project conditions during installation to provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances.
- C. Protect glass edges from damage during handling and installation. Remove damaged glass from Project site and legally dispose of off Project site. Damaged glass is glass with edge damage or other imperfections that, when installed, could weaken glass and impair performance and appearance.
- D. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction testing.
- E. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- F. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.
- G. Provide spacers for glass lites where length plus width is larger than 50 inches (1270 mm).
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glass. Install correct size and spacing to preserve required face clearances, unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glass and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.
- H. Provide edge blocking where indicated or needed to prevent glass lites from moving sideways in glazing channel, as recommended in writing by glass manufacturer and according to requirements in referenced glazing publications.
- I. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.
- J. Set glass lites with proper orientation so that coatings face exterior or interior as specified.
- K. Where wedge-shaped gaskets are driven into one side of channel to pressurize sealant or gasket on opposite side, provide adequate anchorage so gasket cannot walk out when installation is subjected to movement.
- L. Square cut wedge-shaped gaskets at corners and install gaskets in a manner recommended by gasket manufacturer to prevent corners from pulling away; seal corner joints and butt joints with sealant recommended by gasket manufacturer.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glass, their exposed edges are flush with or protrude slightly above sightline of stops.
- B. Install tapes continuously, but not necessarily in one continuous length. Do not stretch tapes to make them fit opening.
- C. Cover vertical framing joints by applying tapes to heads and sills first and then to jambs. Cover horizontal framing joints by applying tapes to jambs and then to heads and sills.
- D. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- E. Do not remove release paper from tape until right before each glazing unit is installed.
- F. Apply heel bead of elastomeric sealant.
- G. Center glass lites in openings on setting blocks and press firmly against tape by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings.
- H. Apply cap bead of elastomeric sealant over exposed edge of tape.

3.5 GASKET GLAZING (DRY)

- A. Cut compression gaskets to lengths recommended by gasket manufacturer to fit openings exactly, with allowance for stretch during installation.
- B. Insert soft compression gasket between glass and frame or fixed stop so it is securely in place with joints miter cut and bonded together at corners.
- C. Installation with Drive-in Wedge Gaskets: Center glass lites in openings on setting blocks and press firmly against soft compression gasket by inserting dense compression gaskets formed and installed to lock in place against faces of removable stops. Start gasket applications at corners and work toward centers of openings. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- D. Installation with Pressure-Glazing Stops: Center glass lites in openings on setting blocks and press firmly against soft compression gasket. Install dense compression gaskets and pressure-glazing stops, applying pressure uniformly to compression gaskets. Compress gaskets to produce a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.
- E. Install gaskets so they protrude past face of glazing stops.

3.6 CLEANING AND PROTECTION

- A. Protect exterior glass from damage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations. If, despite such protection, contaminating substances do come into contact with glass, remove substances immediately as recommended in writing by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for buildup of dirt, scum, alkaline deposits, or stains; remove as recommended in writing by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, or abraded or that is damaged from natural causes, accidents, and vandalism, during construction period.
- E. Wash glass on both exposed surfaces in each area of Project not more than four days before date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended in writing by glass manufacturer.

END OF SECTION 08 80 00

SECTION 09 29 00 - GYPSUM BOARD ASSEMBLIES

PART 1 – GENERAL

1.2 SUMMARY

A. Section Includes:

1. Non-load bearing steel framing members for gypsum board assemblies.
2. Gypsum board assemblies.
3. Abuse Resistant Gypsum Wallboard

B. Products Installed but not specified under this Section:

1. Acoustical insulation in partitions - acoustical insulation is furnished under Division 7 Section - Building Insulation.
2. Acoustical sealants - acoustical sealants are furnished under Division 7 Section – Joint Sealants.

C. Related Documents/Sections: Carefully examine the Contract Documents for requirements which affect work of this Section. Documents and specification sections containing requirements which relate to this Section include, but are not necessarily limited to:

1. General and Supplementary Conditions and sections in Division 1 of these Specifications.
2. Division 7 Section - Building Insulation.
3. Division 7 Section - Joint Sealants.
4. Division 8 Section - Standard Steel Doors and Frames: Hollow metal frames.
5. Division 9 Section - Tile
6. Division 9 Section - Painting: Field painting.

1.3 DEFINITIONS

- A. Gypsum Board Construction Terminology: Refer to ASTM C 11 and GA-505 for definitions of terms related to gypsum board assemblies not defined in this Section or in other referenced standards.

1.4 ASSEMBLY PERFORMANCE REQUIREMENTS

- A. Sound Transmission Characteristics: For gypsum board assemblies indicated to have STC ratings, provide materials and construction identical to those of assemblies whose STC ratings were determined per ASTM E 90 and classified per ASTM E 413 by a qualified independent testing agency.

1.5 SUBMITTALS:

A. General:

1. Identify proposed changes, differences, and discrepancies, including verbiage, terms, and definitions, between Contract Documents and submittals.

B. Product Data:

1. For each type of product indicated, submit manufacturer's specifications and other data needed to prove compliance with the specified requirements.

D. Samples:

1. Samples for Verification Purposes: 6" x 6" units of each facing material indicated.

E. Quality Control Submittals:

1. Certificates:

- a. Manufacturer's Certificates: Provide product certificates signed by manufacturers of gypsum board assembly components certifying that their products comply with specified requirements.

2. Manufacturer's Instructions:

- a. Submit manufacturer's recommended installation procedures which, when reviewed by the Architect, may become the basis for accepting or rejecting actual installation procedures used on the work.

F. Contract Closeout Submittals:

1. Upon completion of this portion of the Work, and as a condition of its acceptance, deliver to the Architect requisite copies of the following.
 - a. Project Record Documents.

1.6 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: Where fire-rated gypsum board assemblies are indicated, provide materials and construction identical to those of assemblies tested for fire resistance per ASTM E 119 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.

- a. Fire Resistance Ratings: As indicated by reference to GA File Numbers in GA-600 "Fire Resistance Design Manual" or to design designations in UL "Fire Resistance Directory" or in the listing of another testing and inspecting agency acceptable to authorities having jurisdiction.

- B. Single-Source Responsibility for Steel Framing: Obtain steel framing members for gypsum board assemblies from a single manufacturer.

- C. Single-Source Responsibility for Panel Products: Obtain each type of gypsum board and other panel products from a single manufacturer.

- D. Single-Source Responsibility for Finishing Materials: Obtain finishing materials from either the same manufacturer that supplies gypsum board and other panel products or from a manufacturer acceptable to gypsum board manufacturer.

- E. Field Samples: On actual gypsum board assemblies, prepare field samples of at least 100 sq. ft. in surface area for the following applications. Simulate finished lighting conditions for review of in-place unit of Work.
 - a. Wall surfaces indicated to receive nontextured paint finishes.
 - b. Ceiling surfaces indicated to receive nontextured paint finishes.
 - c. Surfaces indicated to receive textured finishes specified in this Section.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Neatly stack gypsum panels flat to prevent sagging.
- C. Handle gypsum board to prevent damage to edges, ends, and surfaces. Do not bend or otherwise damage metal corner beads and trim.

1.8 PROJECT CONDITIONS

- A. Environmental Conditions, General: Establish and maintain environmental conditions for applying and finishing gypsum board to comply with ASTM C 840 and with gypsum board manufacturer's recommendations.
- B. Room Temperatures: For non-adhesive attachment of gypsum board to framing, maintain not less than 40 deg F (4 deg C). For adhesive attachment and finishing of gypsum board, maintain not less than 50 deg F (10 deg C) for 48 hours prior to application and continuously after until dry. Do not exceed 95 deg F (35 deg C) when using temporary heat sources.
- C. Ventilation: Ventilate building spaces, as required, for drying joint treatment materials. Avoid drafts during hot dry weather to prevent finishing materials from drying too rapidly.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Recycled Content: Provide regular gypsum board with minimum 80 percent recycled content, including recycled content face paper; provide specialty gypsum board products with at least 10 percent recycled content; provide steel with at least 25 percent post-consumer recycled content.
- B. Recycled Content: Provide steel with at least 25 percent post-consumer recycled content.
- C. Regional Materials: Provide at least 25 percent of steel manufactured and containing recycled raw materials recovered within 100-mile radius of Project Site.
- D. Gypsum board and joint compound installed at ceilings and acoustic insulation: Comply with emissions requirements of CDPH Standard Method in Section 018113.

2.2 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Steel Framing and Furring:
 - a. ClarkDietrich
 - b. Marino Industries Corp.
 - c. Gold Bond Building Products Div., National Gypsum Co.
 - d. Unimast Inc.
2. Gypsum Board and Related Products:
 - a. Lafarge North America
 - b. Gold Bond Building Products Div., National Gypsum Co.
 - c. United States Gypsum Co.
 - d. Georgia-Pacific Gypsum.

2.3 STEEL FRAMING COMPONENTS FOR SUSPENDED AND FURRED CEILINGS

- A. General: Provide components complying with ASTM C 754 for materials and sizes unless otherwise indicated.
- B. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated, and with capability to sustain, without failure, a load equal to 10 times that imposed by ceiling construction, as determined by testing per ASTM E 1190 conducted by a qualified testing agency.
- C. Wire for Hangers and Ties: ASTM A 641, Class 1 zinc coating, soft temper.
- D. Steel Studs for Furring Channels: ASTM C 645, with flange edges bent back 90 deg and doubled over to form 3/16-inch minimum lip (return), minimum thickness of base (uncoated) metal and minimum depth as follows:
 1. Thickness: 0.0312 (20-ga.) inch, unless otherwise required for loading.
 2. Depth: as noted on drawings.
 3. Protective Coating (use above ceilings in wet or humid areas): G40 hot-dip galvanized coating per ASTM A 525.
- E. Grid Suspension System for Interior Ceilings (do not use above ceilings in wet or humid areas): ASTM C 645, manufacturer's standard direct-hung grid suspension system composed of main beams and cross furring members that interlock to form a modular supporting network.

2.4 STEEL FRAMING FOR WALLS AND PARTITIONS

- A. General: Provide steel framing members complying with the following requirements:
 1. Component Sizes and Spacings: As indicated but not less than that required to comply with ASTM C 754 under the following maximum deflection and lateral loading conditions:
 - a. Maximum Deflection: L/240 at 5 lb. per sq. ft.
 2. Protective Coating: G40 hot-dip galvanized coating per ASTM A 525.

- B. Steel Studs and Runners: ASTM C 645, with flange edges of studs bent back 90 deg and doubled over to form 3/16-inch-wide minimum lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
1. Thickness: 25 gauge
 2. 20-ga.at all framed openings.
 3. Depth: As indicated on drawings.
- C. Steel Studs and Runners for Wall Assemblies up to 20'-0" in height. Basis of Design: ClarkDietrich 600PDS125-30-P. ASTM C 645, with flange edges of studs bent back 90 deg and doubled over to form stiffening lip (return) and complying with the following requirements for minimum thickness of base (uncoated) metal and for depth:
1. Thickness: 0.0312 inches (L/240 max deflection).
 2. Flange width: 1.250 inches
 3. Stiffening lip: 0.250 inches
 4. 20-ga.at all framed openings.
 5. Depth: 6 inches
 6. Provide 30mil 2-1/2" Leg Max Trak
 7. Gypsum Board to be installed in the vertical direction, full height of wall, following manufacturer's installation guidelines.

2.5 FASTENERS

A. Fasteners for Metal Framing, General:

1. Provide fasteners of type, material, size, corrosion resistance, holding power, and other properties required to fasten steel framing and furring members securely to substrates involved.
 - a. Comply with the recommendations of gypsum board manufacturers for applications indicated.
2. Provide steel drill screws complying with ASTM C 1002 for the following applications:
 - a. Fastening gypsum board to steel members less than 0.03 inch thick.
3. Provide steel drill screws complying with ASTM C 954 for the following applications:
 - a. Fastening gypsum board to steel members from 0.033 to 0.112 inch thick.

B. Fasteners for Metal Framing, Ceilings in Wet or Humid Areas:

1. In addition to general fastener requirements, provide fasteners for ceilings in wet or humid areas with organic polymer coating with salt-spray resistance to red rust of more than 800 hours per ASTM B 117.
2. Manufacturers of Organic-Polymer-Coated Steel Fasteners:
 - a. "Climaseal," ITW Buildex.
 - b. "Stalgard," Elco Industries, Inc.

2.6 GYPSUM BOARD PRODUCTS

- A. General: Provide gypsum board of types indicated in maximum lengths available to minimize end-to-end butt joints.
 - 1. Thickness: Provide gypsum board in thicknesses indicated to comply with ASTM C 840 for application system and support spacing indicated.
- B. Products: Subject to compliance with requirements, provide the following gypsum wallboard products:
 - 1. Representative Products:
 - a. National Gypsum: Gold Bond® BRAND Hi-Impact® XP® Gypsum Board with Sporgard:
 - 1). Consists of a tapered edge, mold and moisture resistant, fire-resistant, Type X gypsum core encased in a heavy, abrasion and mold/mildew/moisture resistant, 100% recycled, National Gypsum's original PURPLE® paper on the face side and a heavy, abrasion and mold/mildew/moisture resistant, 100% recycled, gray paper on the back side. A fiberglass mesh is embedded into the core, close to the back of the board to provide additional impact/penetration resistance.
 - b. US Gypsum: USG Sheetrock® Brand - Mold Tough® Vhi Firecode® X Panels
 - 2. Abuse Resistant:
 - a. Abuse-Resistant Gypsum Board: ASTM C 1629/C 1629M, Level 2.
 - b. Core: 5/8 inch (15.9 mm), Type X. 1/4" & 3/8" for curved surfaces.
 - c. Long Edges: Tapered.
 - d. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 - 3. Tile Backer Board
 - a. Water and Mold resistant coated Glass-Matt Tile Backer Board
 - b. Cementitious Backer Units: ANSI A118.9 and ASTM C 1288 or ASTM C 1325, with manufacturer's standard edges.
 - c. Thickness: 5/8 inch (15.9 mm).
 - d. Mold Resistance: ASTM D 3273, score of 10 as rated according to ASTM D 3274.
 - e. Water Resistance: To exceed ASTM C1178
 - 4. Ceiling Type: Manufactured to have more sag resistance than regular-type gypsum board for use on all gypsum ceilings and soffits.
 - a. Thickness: 1/2 inch (12.7 mm).
 - b. Long Edges: Tapered

2.7 TRIM ACCESSORIES FOR GYPSUM WALLBOARD

- A. Accessories for Interior Installation: Corner beads, edge trim, Horizontal clips/channels and control joints complying with ASTM C 1047 and requirements indicated below:
 - 1. Material: Formed metal, or metal combined with paper, with metal complying with the following requirement:

- a. Sheet steel zinc-coated by hot-dip process.
2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. Plastic cornerbead on outside corners, unless otherwise indicated.
 - b. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - c. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - d. U-bead with face and back flanges; face flange formed to be left without application of joint compound. Use U-bead where indicated.
 - e. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.
 - f. Horizontal Resilient Clips by US Gypsum or horizontal resilient channels by Gold Bond or equal.
 - g. Frye Reglet, Gordon or Pittcon trim piece for drywall reveals where reveals are shown on the drawings. Basis of Design: Pittcon SWR-063-050..
- B. Accessories for Interior Ceiling Installation in Wet or Humid Areas: Corner beads, edge trim, and control joints complying with ASTM C 1047 and requirements indicated below:
 1. Material: Plastic.
 2. Shapes indicated below by reference to Fig. 1 designations in ASTM C 1047:
 - a. LC-bead with both face and back flanges; face flange formed to receive joint compound. Use LC-beads for edge trim unless otherwise indicated.
 - b. L-bead with face flange only; face flange formed to receive joint compound. Use L-bead where indicated.
 - c. One-piece control joint formed with V-shaped slot, with removable strip covering slot opening.

2.8 JOINT TREATMENT MATERIALS

- A. General: Provide joint treatment materials complying with ASTM C 475 and the recommendations of both the manufacturers of sheet products and of joint treatment materials for each application indicated.
- B. Joint Tape for Gypsum Board: Paper reinforcing tape (use at ceiling in wet or humid areas), unless otherwise indicated.
 1. Use pressure-sensitive or staple-attached open-weave glass-fiber reinforcing tape with compatible joint compound where recommended by manufacturer of gypsum board and joint treatment materials for application indicated.
- C. Setting-Type Joint Compounds for Gypsum Board: Factory-packaged, job-mixed, chemical-hardening powder products formulated for uses indicated.
 1. Where setting-type joint compounds are indicated as a taping compound only or for taping and filling only, use formulation that is compatible with other joint compounds applied over it.

- a. Use setting-type joint compound for taping and filling of ceiling in wet or humid areas.
2. For prefilling gypsum board joints, use formulation recommended by gypsum board manufacturer for this purpose.
3. For topping compound, use sandable formulation.
- D. Drying-Type Joint Compounds for Gypsum Board: Factory-packaged vinyl-based products complying with the following requirements for formulation and intended use.
 1. Ready-Mixed Formulation: Factory-mixed product.
 2. Taping compound formulated for embedding tape and for first coat over fasteners and face flanges of trim accessories.
 3. Topping compound formulated for fill (second) and finish (third) coats.

2.9 MISCELLANEOUS MATERIALS

- A. General: Provide auxiliary materials for gypsum board construction that comply with referenced standards and recommendations of gypsum board manufacturer.
- B. Spot Grout: ASTM C 475, setting-type joint compound recommended for spot grouting hollow metal door frames.
- C. Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates to which gypsum board assemblies attach or abut, installed hollow metal frames, cast-in-anchors, and structural framing with Installer present for compliance with requirements for installation tolerances and other conditions affecting performance of assemblies specified in this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.
 1. For ceilings in wet or humid areas, verify that steel support is located @ 12" o.c. maximum.
 2. Verify that area above ceiling is vented.
 3. Confirm reinforcement locations of heavy wall mounted items and future grab bars.

3.2 PREPARATION

- A. Ceiling Anchorages: Coordinate installation of ceiling suspension systems with installation of overhead structural assemblies to ensure that inserts and other provisions for anchorages to building structure have been installed to receive ceiling hangers that will develop their full strength and at spacing required to support ceilings.

3.3 INSTALLING STEEL FRAMING, GENERAL

- A. Steel Framing Installation Standard: Install steel framing to comply with ASTM C 754 and with ASTM C 840 requirements that apply to framing installation.

- B. Install supplementary framing, blocking, and bracing at terminations in gypsum board assemblies to support fixtures, equipment services, heavy trim, grab bars, toilet accessories, furnishings, or similar construction. Comply with details indicated and with recommendations of gypsum board manufacturer or, if none available, with "Gypsum Construction Handbook" published by United States Gypsum Co.
 - 1. Install supplementary framing and blocking at locations indicated for heavy wall-mounted items.
- C. Isolate steel framing from building structure slab above to prevent transfer of loading imposed by structural movement.
- D. Do not bridge building expansion and control joints with steel framing or furring members. Independently frame both sides of joints with framing or furring members as indicated.
- E. Install special ceiling construction throughout room in which wet or humid areas occur.

3.4 INSTALLING STEEL FRAMING FOR SUSPENDED AND FURRED CEILINGS

- A. Suspend ceiling hangers from building structural members and as follows:
 - 1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
 - 2. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with the location of hangers required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards.
 - 3. Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eyescrews, or other devices and fasteners that are secure and appropriate for substrate, and in a manner that will not cause them to deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
 - 4. Do not attach hangers to steel deck tabs.
 - 5. Do not attach hangers to steel roof deck. Attach hangers to structural members.
 - 6. Do not connect or suspend steel framing from ducts, pipes or conduit.
- B. Sway-brace suspended steel framing with hangers used for support.
- C. Install suspended steel framing components in sizes and at spacings indicated but not less than that required by the referenced steel framing installation standard.
 - 1. Wire Hangers: 0.1620-inch (8-gage) diameter, 4 feet o.c.
 - 2. Steel Studs for Furring Channels: 24 inches o.c.
 - a. Ceilings in Wet or Humid Areas: Provide steel studs for furring channels or alternate suspended type support system @ 12 inches o.c.

- D. Installation Tolerances: Install steel framing components for suspended ceilings so that cross-furring members or grid suspension members are level to within 1/8 inch in 12 feet as measured both lengthwise on each member and transversely between parallel members.

3.5 INSTALLING STEEL FRAMING FOR WALLS AND PARTITIONS

- A. Install runners (tracks) at floors, ceilings, and structural walls and columns where gypsum board stud assemblies abut other construction.
1. Where studs are installed directly against exterior walls, install asphalt felt strips between studs and wall.
- B. Installation Tolerances: Install each steel framing and furring member so that fastening surfaces do not vary more than 1/8 inch from the plane formed by the faces of adjacent framing.
- C. Extend partition framing full height to structural supports or substrates above suspended ceilings, except where partitions are indicated to terminate at suspended ceilings. Cut studs 2 inch short of full height. Continue framing over frames for doors and openings and frame around ducts penetrating partitions above ceiling to provide support for gypsum board.
1. For STC-rated and fire-resistive-rated partitions requiring partitions to extend to the underside of floor/roof slabs and decks or other continuous solid structural surfaces to obtain ratings, install framing around structural and other members extending below floor/roof slabs and decks, as needed, to support gypsum board closures needed to make partitions continuous from floor to underside of solid structure.
2. Provide horizontal bracing as where necessary to achieve L/240 deflection for all wall partitions, if 20 ga. studs are not sufficient for the span.
3. Provide horizontal bracing for any wall 12'-0" in height or greater. Horizontal bracing to be installed at mid-height of wall.
- D. Install steel studs and furring in sizes and at spacings indicated but not less than that required by the referenced steel framing installation standard to comply with maximum deflection and minimum loading requirements specified:
1. Typical Construction: Space studs at 16 inches o.c.
- a. Walls Supporting Heavy Items: Space double studs (back to back) at 12 inches o.c.
- E. Install steel studs so that flanges point in the same direction and so that leading edges or ends of each gypsum board can be attached to open (unsupported) edges of stud flanges first.
1. At walls supporting heavy items, install double studs back to back and screw together at 12 inches o.c.
- F. Frame door openings to comply with details indicated, with GA-219, and with applicable published recommendations of gypsum board manufacturer. Attach vertical studs at jambs with screws either directly to frames or to jamb anchor clips on door frames; install runner track section (for cripple studs) at head and secure to jamb studs. Provide 20 ga. studs at all framed openings.

1. Extend vertical jamb studs through suspended ceilings and attach to underside of floor or roof structure above.
 2. Provide GA-219-89, Figure 6 or Figure 7 at all door jambs.
- G. Frame openings other than door openings to comply with details indicated or, if none indicated, in same manner as required for door openings. Install framing below sills of openings to match framing required above door heads.
- H. Provide continuous sheet metal reinforcement for attachment of handrails, grab rails, wood paneling and other items supported by gypsum board assemblies.

3.7 APPLYING AND FINISHING GYPSUM BOARD, GENERAL

- A. Board Application and Finishing Standards: Install and finish gypsum panels to comply with ASTM C 840 and GA-216.
- B. Install sound attenuation blankets where indicated prior to installing gypsum panels unless blankets are readily installed after panels have been installed on one side.
- C. Install ceiling board panels across framing to minimize the number of abutting end joints and avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- D. Install wall/partition board panels to minimize the number of abutting end joints or avoid them entirely. Stagger abutting end joints not less than one framing member in alternate courses of board. At stairwells and other high walls, install panels horizontally with end abutting joints over studs and staggered.
- E. Install gypsum panels with face side out. Do not install imperfect, damaged, or damp panels. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- F. Locate both edge or end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Position adjoining panels so that tapered edges abut tapered edges, and field-cut edges abut field-cut edges and ends. Do not place tapered edges against cut edges or ends. Stagger vertical joints over different studs on opposite sides of partitions. Avoid joints at corners of framed openings where possible.
1. Do not place cut edges of water resistant gypsum board within 48" of slab.
- G. Attach gypsum panels to steel studs so that the leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- H. Attach gypsum panels to framing provided at openings and cutouts.
- I. Spot grout hollow metal door frames for all doors. Apply spot grout at each jamb anchor clip and immediately insert gypsum panels into frames.
- J. Form control joints and expansion joints at locations indicated and as detailed, with space between edges of adjoining gypsum panels, as well as supporting framing behind gypsum panels.

- K. Cover both faces of steel stud partition framing with gypsum panels in concealed spaces (above ceilings, etc.), except in chase walls that are braced internally.
 - 1. Except where concealed application is indicated or required for sound, fire, air, or smoke ratings, coverage may be accomplished with scraps of not less than 8 sq. ft. in area.
 - 2. Fit gypsum panels tightly around ducts, pipes, and conduits.
 - 3. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4-to-1/2-inch-wide joints to install sealant.
- L. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors, as detailed. Provide 1/4-inch-to-1/2-inch-wide spaces at these locations and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.
- M. Where STC-rated gypsum board assemblies are indicated, seal construction at perimeters, behind control and expansion joints, openings, and penetrations with a continuous bead of acoustical sealant including a bead at both faces of the partitions. Comply with ASTM C 919 and manufacturer's recommendations for location of edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- N. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's recommendations.

3.8 GYPSUM BOARD APPLICATION METHODS

- A. Single-Layer Application: Install gypsum wallboard panels as follows:
 - 1. On ceilings apply gypsum board prior to wall/partition board application to the greatest extent possible.
 - 2. On partitions/walls apply gypsum board vertically (parallel to framing), unless otherwise indicated, and provide sheet lengths which will minimize end joints.
 - 3. On partitions/walls 8'-1" or less in height apply gypsum board horizontally (perpendicular to framing); use maximum length sheets possible to minimize end joints.
 - 4. On Z-furring members apply gypsum board vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
- B. Single-Layer Fastening Methods: Apply gypsum panels to supports as follows:
 - 1. Fasten with screws.
- C. Double-Layer Application: Install gypsum wall board for base layer and gypsum wallboard for face layer.
 - 1. On ceilings apply base layer prior to application of base layer on walls/partitions; apply face layers in same sequence. Offset joints between layers at least 10 inches. Apply base layers at right angles to supports unless otherwise indicated.
 - 2. On partitions/walls apply base layer and face layers vertically (parallel to framing) with joints of base layer over supports and face layer joints offset at least 10 inches with base layer joints.

3. On Z-furring members apply base layer vertically (parallel to framing) and face layer either vertically (parallel to framing) or horizontally (perpendicular to framing) with vertical joints offset at least one furring member. Locate edge joints of base layer over furring members.
 4. Provide either V-joint type backing board or tape and finish joints to produce a flat surface.
- D. Double-Layer Fastening Methods: Apply base layer of gypsum panels and face layer to base layer as follows:
1. Fasten both base layers and face layers separately to supports with screws.
- E. Ceilings in Wet or Humid Areas: Apply gypsum board panels perpendicular to supports, with end joints staggered over supports. Install with 1/4-inch open space where panels abut other construction or structural penetrations.
1. Fasten with corrosion-resistant screws spaced @ 6" o.c.
 2. Use 5/8" proprietary fire-resistive-rated type gypsum board panels.
- F. Exterior Soffits and Ceilings: Apply exterior gypsum soffit board panels perpendicular to supports, with end joints staggered over supports. Install with 1/4-inch open space where panels abut other construction or structural penetrations.

3.9 INSTALLING TRIM ACCESSORIES

- A. General: For trim accessories with back flanges, fasten to framing with the same fasteners used to fasten gypsum board. Otherwise, fasten trim accessories according to accessory manufacturer's directions for type, length, and spacing of fasteners.
- B. Install corner beads at external corners.
- C. Install edge trim where edge of gypsum panels would otherwise be exposed or semiexposed. Provide edge trim type with face flange formed to receive joint compound except where other types are indicated.
1. Install LC-bead where gypsum panels are tightly abutted to other construction and back flange can be attached to framing or supporting substrate.
 2. Install L-bead where edge trims can only be installed after gypsum panels are installed.
 3. Install U-bead where indicated.
 4. Install aluminum reveal trim and other accessories where indicated.
- D. Install control joints at locations indicated, and where not indicated according to ASTM C 840, and in locations approved by Architect for visual effect. Provide control joints at 30' o/c max. Control joints to occur over doorways or at column cover inside corners wherever possible.

3.10 FINISHING GYPSUM BOARD ASSEMBLIES

- A. General: Apply joint treatment at gypsum board joints (both directions); flanges of corner bead, edge trim, and control joints; penetrations; fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration and levels of gypsum board finish indicated.
1. Apply joint treatment to each layer of double layer assemblies.

- B. Prefill open joints, rounded or beveled edges, and damaged areas using setting-type joint compound.
- C. Apply joint tape over gypsum board joints except those with trim accessories having concealed face flanges not requiring taping to prevent cracks from developing in joint treatment at flange edges.
- D. Apply joint tape over gypsum board joints and to trim accessories with concealed face flanges as recommended by trim accessory manufacturer and as required to prevent cracks from developing in joint compound at flange edges.
- F. Levels of Gypsum Board Finish: Provide the following levels of gypsum board finish per GA-214.
 - 1. Level 1 for ceiling plenum areas, concealed areas, inner layer of double layer assemblies, and where indicated, unless a higher level of finish is required for fire-resistive-rated assemblies and sound-rated assemblies.
 - 1. Level 3 for gypsum board surfaces indicated to receive wood paneling.
 - 2. Level 4 for gypsum board surfaces indicated to receive wallcoverings, and flat or egg-shell paints.
- G. For level 4 gypsum board finish, embed tape in finishing compound plus two separate coats applied over joints, angles, fastener heads, and trim accessories using one of the following combinations of joint compounds (not including prefill), and sand between coats and after last coat.
- I. Where level 1 gypsum board finish is indicated, apply joint compound specified for embedding coat.

3.11 CLEANING AND PROTECTION

- A. Promptly remove any residual joint compound from adjacent surfaces.
- B. Provide final protection and maintain conditions, in a manner suitable to Installer, that ensures gypsum board assemblies remain without damage or deterioration at time of Substantial Completion.

END OF SECTION 09 29 00

SECTION 09 29 53 Partition Gap Closure

PART 1 – GENERAL

1.00 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.
- B. Baltimore County Property Management's general requirements included in each bid package shall also apply to this Section. In case of conflict the more stringent document shall take precedence.

1.01 SECTION INCLUDES:

- A. This section includes drywall accessories or noise control components featuring Basis of Design Mullion Mate® Series 40 Extruded Aluminum Partition Gap Closure or approved equal, as shown on the Architectural Drawings.
- B. Related sections include the following:
 - 1. 09 29 00 GYPSUM ASSEMBLIES

1.02 RELATED SECTIONS:

- A. Section 1 Specification sections as it applies to work of this Section.
- B. Finish Schedule or Finish Legend as it applies to work of this Section.

1.03 REFERENCES:

- A. GENERAL
 - 1. Comply with applicable requirements of the following, except where more stringent requirements are indicated by building codes.
- B. American Architectural Manufacturers Association (AAMA):
 - 1. AAMA 2604 – Specification for Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels
- C. American Society for Testing and Materials (ASTM)
 - 1. ASTM D2247 Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity
 - 2. ASTM E84 Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 3. ASTM E1399/E1399M-97 Standard Test Method for Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems.
 - 4. ASTM E90-2016 Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements.
- D. National Association of Architectural Metal Manufacturers (NAAMM)
 - 1. Metal Finishes Manual for Architectural and Metal Products

1.04 DESIGN/PERFORMANCE REQUIREMENTS:

- A. All components of the Extruded Aluminum Partition Gap Closure shall be provided by one (1) Manufacturer to ensure single source responsibility and quality control.
- B. Partition Gap Closure shall meet specified performance requirements listed in ASTM E1399/E1399M-97 for the joint width minimum and maximum dimension verification as well as the cyclic movement performance for Class IV – Combined movement which encompasses Seismic, Thermal and Wind Sway, movement at a cycling rate greater than or equal to 10 cycles per minute.
- C. Sound Transmission Class (STC) up to STC 50 per ASTM E90-2016.
- D. All materials are Class A rated per ASTM E84.

1.05 SUBMITTALS:

- A. Submission must be made within ten (10) working days of the General Contract Award to avoid project delay.
- B. Product Data: Submit Manufacturer's:
 - 1. Product Specifications
 - 2. Detail Drawings.
 - 3. Installation Instructions
- C. Samples:
 - 1. Submit samples consisting of 12" long Extruded Aluminum Partition Gap Closure and finish Q-Panel as specified, as well as accessories.

1.06 QUALITY ASSURANCE:

- A. Source Limitations:
 - 1. All components of the Extruded Aluminum Partition Gap Closures shall be provided by a single Manufacturer to ensure responsibility and quality control.
- B. Manufacturer Qualifications:
 - 1. Manufacturer must have manufacturing and delivery capacity required for the project and shall have successfully completed at least ten (10) projects within the past five (5) years, utilizing systems, materials, and techniques as herein specified.
 - 2. Manufacturer must own and operate its own manufacturing facilities for all metal components. "Stick Built" or "Kit of Parts Systems" consisting of components from a variety of Manufacturers/Fabricators will not be considered or accepted.
 - 3. Manufacturer must own and operate its own painting and finishing facility to assure single source responsibility and quality control.
- C. Installer Qualifications:
 - 1. Installers shall have a minimum of five (5) years of experience installing systems of similar type and scope as those specified in this section.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING:

- A. All materials shall be protected during fabrication, shipment and installation to prevent damage to the finished work from other trades.
- B. To avoid lasting deformation of the Extruded Aluminum Partition Gap Closure components when exposed to temperature and humidity extremes, store this material at or near room temperature. Allow a minimum of 48 hours for the product to adjust to internal room temperature and humidity conditions before installing the Extruded Aluminum Partition Gap Closure.

- C. Store Extruded Aluminum Partition Gap Closure inside a well-ventilated area, away from uncured concrete and masonry, and protected from the weather, moisture, soiling, abrasion, extreme temperatures, and humidity.
- D. Maintain environmental conditions (temperature, humidity and ventilation) within limits recommend by Manufacturer for optimum results. Do not install products under environmental conditions outside Manufacturer's recommendations.
- E. Exercise care in loading, unloading, storing and installing units to preclude bending, warping, twisting and other surface damage.

1.08 WARRANTY:

- A. Standard Warranty:
 - 1. Furnish Manufacturer's Standard Warranty of two (2) years for workmanship and for finish against defects in materials and/or workmanship.
- B. Extended Workmanship Warranty:
 - 1. Furnish Manufacturer's Standard Workmanship Warranty (must be requested at time of quotation) may be extended up to a maximum of twenty (20) years from date of material shipment, when installed in accordance with Manufacturer's recommendations.
 - 2. Provide a one (1) year extension of the Standard Workmanship Warranty for a total of three (3) years coverage
- C. Extended Finish Warranty:
 - 1. Furnish Manufacturer's Standard Finish Warranty (must be requested at time of quotation) may be extended up to a maximum of twenty (20) years from date of material shipment, when installed in accordance with Manufacturer's recommendations.
 - 2. Provide a one (1) year extension of the Standard Finish Warranty for a total of three (3) years coverage

1.09 SUBSTITUTIONS:

- A. No substitutions are permitted for the Extruded Aluminum Partition Gap Closure.
- B. Requests for substitutions will be considered in accordance with provisions of Section 01 60 00. Companies desiring to submit a proposal shall submit all descriptive information of the system proposed including photographs and Shop Drawings of at least ten (10) projects within the past five (5) years, utilizing systems, materials and techniques as herein specified.

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

- A. Basis-of-Design: Subject to compliance with requirements, provide Mullion Mate® Pro Extruded Aluminum Partition Gap Closures manufactured by Gordon, Inc. For all inquiries contact:
Gordon, Inc.
5023 Hazel Jones Road
Bossier City, LA 71111
(800) 747-8954
sales@mullionmate.com

- B. Or Approved Equal.
 - a. Mull-It-Over Mullion Trim Cap
 - b. Or other approved equal.
- C. The listed Manufacturer shall not be construed as closing specifications to other prospective Manufacturers, but rather as establishing a level of quality in a metal system. Other systems may be submitted for approval, as provided for in the specifications at least ten (10) working days prior to submission of bids. Companies desiring to submit a proposal shall submit all descriptive information of the system proposed including photographs and Shop Drawings of at least ten (10) projects within the past five (5) years, utilizing systems, materials, and techniques as herein specified.

2.02 MATERIALS:

- A. Provide metals free from surface blemishes where exposed to view in finished Extruded Aluminum Partition Gap Closures. Surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished Extruded Aluminum Partition Gap Closures are not acceptable. All metal shall be of the highest commercial grade available.
- B. Extruded Aluminum Partition Gap Closures are pre-assembled and spring-loaded to provide a tight fit for vertical junctures of partitions and window walls.
- C. Materials:
 - 1. Aluminum extrusions: 6063-T5 or T6 temper alloy.
 - 2. Aluminum sheet, 3000 series alloy.

2.03 FABRICATION:

- A. Provide Extruded Aluminum Extruded Aluminum Partition Gap Closures in lengths and sizes to fit openings.
- B. Provide Mullion Mate® End Caps in ten (10) foot lengths and widths to fit wall conditions.
 - 1. Mullion Mate® End Caps
- C. Caulk for Extruded Aluminum Partition Gap Closure is to be specified as follows:
 - 1. ASTM C920 Type S, Grade NS, Class 35, Use NT, G, A.
 - 2. Federal Specification TT-S-00230C Type II, Class A
 - 3. NSF Nonfood Compounds Category Code P1

2.04 FINISHES:

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations relative to applying and designating finishes.
- B. All material shall be in a finish chosen from one of the following options:
 - 1. Factory Anodized
 - a. Standard satin clear anodized.

PART 3 - EXECUTION

3.01 EXAMINATION:

- A. Examination of Surfaces: Installer must examine conditions under which work is to be performed and must notify Contractor in writing of unsatisfactory conditions.
- B. Verify that field measurements and block-out dimensions are as shown on Shop Drawings.

3.02 PREPARATION:

- A. Clean surfaces thoroughly prior to installation.
- B. Prepare surfaces using the methods recommended by the Manufacturer to achieve the best result for the project conditions.
- C. To avoid lasting deformation of the Extruded Aluminum Partition Gap Closure components when exposed to temperature and humidity extremes, store this material at or near room temperature. Allow a minimum of 48 hours for the product to adjust to internal room temperature and humidity conditions before installing the Extruded Aluminum Partition Gap Closure.

3.03 INSTALLATION:

- A. Extruded Aluminum Partition Gap Closures shall be inspected before installation to be free from dents, scratches, and other defects.
- B. Install Extruded Aluminum Partition Gap Closures in accordance with Manufacturer's written Installation Instructions and Details.
- C. Space Enclosure: Do not install any work until space is enclosed and weatherproofed, wet-work in space is completed and nominally dry, work above ceilings is complete, and temperature and humidity shall be continuously maintained at values near those of final occupancy.

3.04 CLEANING:

- A. Follow Manufacturer's cleaning instructions for specified finish.

3.05 PROTECTION:

- A. Procedures: Advise the Contractor of procedures required to protect the finished work from damage during the remainder of the construction period.

END OF SECTION

SECTION 09 31 00 - CERAMIC TILE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Glazed Ceramic Wall Tile
- B. Related Sections include the following:
 - 1. Division 7 Section "Joint Sealants" for sealing of expansion, contraction, control, and isolation joints in tile surfaces.
 - 2. Division 9 Section "Gypsum Board Assemblies" for substrates for ceramic tile.

1.2 DEFINITIONS

- A. Module Size: Actual tile size (minor facial dimension as measured per ASTM C 499) plus joint width indicated.
- B. Facial Dimension: Nominal tile size as defined in ANSI A137.1.

1.3 PERFORMANCE REQUIREMENTS

- A. A. Dynamic Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ANSI 137.1, section 9.6:
 - 1. Level Surfaces: DCOF 0.42 Wet.
- B. Static Coefficient of Friction: For tile installed on walkway surfaces, provide products with the following values as determined by testing identical products per ASTM C 1028:
 - 1. Level Surfaces: Minimum 0.6 Wet & Dry.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations of each type of tile and tile pattern. Show widths, details, and locations of expansion, contraction, control, and isolation joints in tile substrates and finished tile surfaces.
- C. Samples for Initial Selection: For each type of tile and grout indicated. Include Samples of accessories involving color selection.
- D. Samples for Verification:

1. Full-size units of each type and composition of tile and for each color and finish required.
 2. Assembled samples with grouted joints for each type and composition of tile and for each color and finish required, at least 12 inches (300 mm) square and mounted on rigid panel. Use grout of type and in color or colors approved for completed work.
 3. Full-size units of each type of trim and accessory for each color and finish required.
 4. Metal edge strips in 6-inch (150-mm) lengths.
- E. Master Grade Certificates: For each shipment, type, and composition of tile, signed by tile manufacturer and Installer.
- F. Product Certificates: For each type of product, signed by product manufacturer.
- G. Qualification Data: For Installer.
- H. Material Test Reports: For each tile-setting and -grouting product.

1.5 QUALITY ASSURANCE

- A. Source Limitations for Tile: Obtain all tile from one source or producer.
1. Obtain tile from same production run and of consistent quality in appearance and physical properties for each contiguous area.
- B. Source Limitations for Setting and Grouting Materials: Obtain ingredients of a uniform quality for each mortar, adhesive, and grout component from a single manufacturer and each aggregate from one source or producer.
- C. Source Limitations for Other Products: Obtain each of the following products specified in this Section through one source from a single manufacturer for each product:
1. Joint sealants.
 2. Metal edge strips.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination."
1. Meeting Agenda to include, but is not limited to:
 - a. Tile and installation material compatibility.
 - b. Grouting Procedure.
 - c. Surface Preparation.
 - d. Maintenance and cleaning products and methods.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver and store packaged materials in original containers with seals unbroken and labels intact until time of use. Comply with requirement in ANSI A137.1 for labeling sealed tile packages.
- B. Store tile and cementitious materials on elevated platforms, under cover, and in a dry location.

- C. Store aggregates where grading and other required characteristics can be maintained and contamination avoided.
- D. Store liquid latexes in unopened containers and protected from freezing.
- E. Handle tile that has temporary protective coating on exposed surfaces to prevent coated surfaces from contacting backs or edges of other units. If coating does contact bonding surfaces of tile, remove coating from bonding surfaces before setting tile.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install tile until construction in spaces is complete and ambient temperature and humidity conditions are maintained at the levels indicated in referenced standards and manufacturer's written instructions.
- B. Concrete Substrates: Prepare according to ASTM F 710.
 - 1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
 - 2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
 - 3. Moisture Testing:
 - a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. in 24 hours.
 - b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

1.8 EXTRA MATERIALS

- A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Tile and Trim Units: Furnish quantity of full-size units equal to 3 percent of amount installed, for each type, composition, color, pattern, and size indicated.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 PRODUCTS, GENERAL

- A. ANSI Ceramic Tile Standard: Provide tile that complies with ANSI A137.1, "Specifications for Ceramic Tile," for types, compositions, and other characteristics indicated.
 - 1. Provide tile complying with Standard grade requirements, unless otherwise indicated.
 - 2. For facial dimensions of tile, comply with requirements relating to tile sizes specified in Part 1 "Definitions" Article.
- B. ANSI Standards for Tile Installation Materials: Provide materials complying with ANSI standards referenced in "Setting and Grouting Materials" Article.
- C. Grout sealer and primers applied within the building waterproofing envelope: Comply with emissions requirements of CDPH Standard Test Method and VOC content limits in Section 01 81 13.
- D. Cement board and underlayment installed within the building waterproofing envelope: Comply with emissions requirements of CDPH Standard Test Method in Section 01 81 13.
- E. Colors, Textures, and Patterns: Where manufacturer's standard products are indicated for tile, grout, and other products requiring selection of colors, surface textures, patterns, and other appearance characteristics, provide specific products or materials complying with the following requirements:
 - 1. As selected by Architect from manufacturer's full range.
- F. Factory Blending: For tile exhibiting color variations within ranges selected during Sample submittals, blend tile in factory and package so tile units taken from one package show same range in colors as those taken from other packages and match approved Samples.
- G. Mounting: For factory-mounted tile, provide back- or edge-mounted tile assemblies as standard with manufacturer, unless otherwise indicated.
- H. Factory-Applied Temporary Protective Coating: Where indicated under tile type, protect exposed surfaces of tile against adherence of mortar and grout by precoating with continuous film of petroleum paraffin wax, applied hot. Do not coat unexposed tile surfaces.

2.3 TILE PRODUCTS

- A. Manufacturers: Subject to compliance with requirements, Manufacturers of products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Garden State Tile (Basis of Design)
 - 2. American Olean
 - 3. Crossville, Inc.
 - 4. Daltile; Div. of Dal-Tile International Inc.
 - 5. Johnson Tiles
 - 6. Royal Mosa

- B. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following listed Basis of Design selections:

1. [CT-1] Floor Tile
 - a. Manufacturer: Garden State Tile
 - b. Collection: Tribeca
 - c. Number: na
 - d. Color: Sand Matte Rectified
 - e. Size: 24" x 24"
 - f. Location: Main Lobby
2. [CT-2] Wall Base Tile
 - a. Manufacturer: Crossville
 - b. Collection: Retro Active 2.0 Porcelain Stone
 - c. Number: RET10.11224PO
 - d. Color: Armor
 - e. Size: 12" x 24" cut to 8" x 8"
 - f. Installation: Wall Base in CT-1 areas only where missing
 - g. Location: Main Lobby
3. [CT-Ex] Wall Base Tile
 - a. Manufacturer: Existing BCDC Attic Stock
 - b. Size: 18" x 18"
 - c. Installation: Fill in as needed per drawings.
 - d. Location: Main Lobby

2.4 SETTING AND GROUTING MATERIALS

- A. Available Manufacturers:
1. Custom Building Products.
 2. Bonsal, W. R., Company.
 3. Bostik.
 4. DAP, Inc.
 5. LATICRETE International Inc.
 6. MAPEI Corporation, (Basis of Design).
- B. [GR-1] GROUT
1. Manufacturer: Full Manufacturer's selection
 2. Number: TBD
 3. Color: Match Existing as selected by Architect from Mfr's. full range.
 4. Location: Existing Tile Attic Stock
- C. [GR-2] GROUT
1. Manufacturer: Full Manufacturer's selection
 2. Number: TBD
 3. Color: Match Existing as selected by Architect from Mfr's. full range.
 4. Location: CT-1 and CT-2

- C. ANSI A118.4, ANSI A118.1, See Evaluations for difference between normal and nonsagging mortar.
 - 1. For wall applications, provide nonsagging mortar that complies with Paragraph C-4.6.1 in addition to the other requirements in ANSI A118.1.
- D. Latex-Portland Cement Mortar (Thin Set): ANSI A118.4, consisting of the following:
 - 1. Prepackaged dry-mortar mix combined with styrene-butadiene-rubber liquid-latex additive.
 - a. For wall applications, provide nonsagging mortar that complies with Paragraph F-4.6.1 in addition to the other requirements in ANSI A118.4.
- E. Premium non-sag, medium-bed and thin-set mortar: Polymer-modified single-component mortar for large format tile ", complying with ANSI A118.4, A118.11 and ISO 13007 C2TES1P1; MAPEI "Ultraflex LFT", Basis of Design.
- F. Fast Setting Sanded Polymer-Modified Grout, complying with ANSI A118.6, ANSI A118.7 and ISO 13007 CG2WAF, for joints between 1/16 inch and 1 inch (1,5 mm and 25 mm) wide; MAPEI "Ultracolor Plus"; Basis of Design, Full Range of Colors to be selected by Architect.
- G. Standard Unsanded Cement Grout: ANSI A118.6, color as selected by Architect from manufacturer's full range.
- H. Polymer-Modified Tile Grout: ANSI A118.7, color as selected by Architect from manufacturer's full range.
- I. Water-Cleanable Epoxy Grout: ANSI A118.3[, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D, color as selected by Architect from manufacturer's full range.

2.5 SURFACE PREPARATION MATERIALS

- A. Reduced-preparation, self-leveling underlayment for smoothing and repairing interior floors before the installation of floor coverings from feather edge to up to 2" (5 cm).; MAPEI, "Ultraplan Easy"; Basis of Design.
 - 1. Requires MAPEI "Primer T".
- B. Cementitious Patching Compound; MAPEI, "Mapecem Quickpatch"; Basis of Design

2.6 CRACK ISOLATION AND WATERPROOFING MEMBRANE

- A. General: Manufacturer's standard product, selected from the following, that complies with ANSI A118.12 for standard performance and is recommended by the manufacturer for the application indicated.

- B. Corrugated Polyethylene: Corrugated polyethylene with dovetail-shaped corrugations and with anchoring webbing on the underside; 3/16-inch (4-mm) nominal thickness.
 - 1. Products: Subject to compliance with requirements, available products that may be incorporated into the Work include, but are not limited to, the following:
 - a. Schluter Systems L.P.; DITRA.
 - b. Premium Latex Based Waterproofing and Crack Isolation Membrane; fast setting, flexible, thin, load-bearing, waterproofing membrane system consisting of a premixed, quick-drying liquid latex, for installation under ceramic tile or complying with ANSI A118.10 and ANSI A118.12; and having IAMPO certification as a shower pan liner; MAPEI, "AquaDefense", Basis of Design.
 - c. Premixed, liquid-rubber, quick-drying crack-isolation membrane for installation under ceramic tile or stone in residential and commercial interior and exterior environments complying with ANSI A118.12; MAPEI, "Mapelastic CI"; Basis of Design.

2.7 ELASTOMERIC SEALANTS

- A. General: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer and characteristics indicated that comply with applicable requirements in Division 7 Section "Joint Sealants."
- B. Colors: Provide colors of exposed sealants to match colors of grout in tile adjoining sealed joints, unless otherwise indicated.
- C. One-Part, Mildew-Resistant Silicone Sealant: ASTM C 920; Type S; Grade NS; Class 25; Uses NT, G, A, and, as applicable to nonporous joint substrates indicated, O; formulated with fungicide, intended for sealing interior ceramic tile joints and other nonporous substrates that are subject to in-service exposures of high humidity and extreme temperatures.
 - 1. Available Products:
 - a. Dow Corning Corporation; Dow Corning 786.
 - b. GE Silicones; Sanitary 1700.
 - c. Pecora Corporation; Pecora 898 Sanitary Silicone Sealant.
 - d. Tremco, Inc.; Tremsil 600 White.

2.8 MISCELLANEOUS MATERIALS

- A. Trowelable Underlayments and Patching Compounds: Latex-modified, portland cement-based formulation provided or approved by manufacturer of tile-setting materials for installations indicated.
- B. Metal Edge Strips for floors: Angle or L-shape, height to match tile and setting-bed thickness, designed specifically for flooring applications, white zinc alloy exposed-edge material. Schluter as Basis of Design. Use at all transitions to other floor materials and between areas of different tile types.

- C. Temporary Protective Coating: Product indicated below that is formulated to protect exposed surfaces of tile against adherence of mortar and grout; compatible with tile, mortar, and grout products; and easily removable after grouting is completed without damaging grout or tile.
 - 1. Petroleum paraffin wax, fully refined and odorless, containing at least 0.5 percent oil with a melting point of 120 to 140 deg F (49 to 60 deg C) per ASTM D 87.
 - 2. Grout release in form of manufacturer's standard proprietary liquid coating that is specially formulated and recommended for use as temporary protective coating for tile.
- D. Tile Cleaner: A neutral cleaner capable of removing soil and residue without harming tile and grout surfaces, specifically approved for materials and installations indicated by tile and grout manufacturers.
- E. Grout Sealer: Manufacturer's standard silicone product for sealing grout joints and that does not change color or appearance of grout.

2.9 MIXING MORTARS AND GROUT

- A. Mix mortars and grouts to comply with referenced standards and mortar and grout manufacturers' written instructions.
- B. Add materials, water, and additives in accurate proportions.
- C. Obtain and use type of mixing equipment, mixer speeds, mixing containers, mixing time, and other procedures to produce mortars and grouts of uniform quality with optimum performance characteristics for installations indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions where tile will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of installed tile.
 - 1. Verify that substrates for setting tile are firm; dry; clean; free of oil, waxy films, and curing compounds; and within flatness tolerances required by referenced ANSI A108 Series of tile installation standards for installations indicated.
 - 2. Verify that installation of grounds, anchors, recessed frames, electrical and mechanical units of work, and similar items located in or behind tile has been completed before installing tile.
 - 3. Verify that joints and cracks in tile substrates are coordinated with tile joint locations; if not coordinated, adjust joint locations in consultation with Architect.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Remove coatings, including curing compounds and other substances that contain soap, wax, oil, or silicone, that are incompatible with tile-setting materials.
- B. Provide concrete substrates for tile floors installed with [adhesives] [or] [thin-set mortar] that comply with flatness tolerances specified in referenced ANSI A108 Series of tile installation standards.
 - 1. Fill cracks, holes, and depressions with trowelable leveling and patching compound according to tile-setting material manufacturer's written instructions. Use product specifically recommended by tile-setting material manufacturer.
 - 2. Remove protrusions, bumps, and ridges by sanding or grinding.
- C. Blending: For tile exhibiting color variations within ranges selected during Sample submittals, verify that tile has been factory blended and packaged so tile units taken from one package show same range of colors as those taken from other packages and match approved Samples. If not factory blended, either return to manufacturer or blend tiles at Project site before installing.
- D. Field-Applied Temporary Protective Coating: Where indicated under tile type or needed to prevent grout from staining or adhering to exposed tile surfaces, precoat them with continuous film of temporary protective coating, taking care not to coat unexposed tile surfaces.

3.3 INSTALLATION, GENERAL

- A. ANSI Tile Installation Standards: Comply with parts of ANSI A108 Series "Specifications for Installation of Ceramic Tile" that apply to types of setting and grouting materials and to methods indicated in ceramic tile installation schedules.
- B. TCA Installation Guidelines: TCA's "Handbook for Ceramic Tile Installation." Comply with TCA installation methods indicated in ceramic tile installation schedules.
- C. Extend tile work into recesses and under or behind equipment and fixtures to form complete covering without interruptions, unless otherwise indicated. Terminate work neatly at obstructions, edges, and corners without disrupting pattern or joint alignments.
- D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish, or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures, and other penetrations so plates, collars, or covers overlap tile.
- E. Jointing Pattern: Lay tile in grid pattern, unless otherwise indicated. Align joints when adjoining tiles on floor, base, walls, and trim are same size. Lay out tile work and center tile fields in both directions in each space or on each wall area. Adjust to minimize tile cutting. Provide uniform joint widths, unless otherwise indicated.
- F. Lay out tile wainscots to next full tile beyond dimensions indicated.
- G. Expansion Joints: Locate expansion joints and other sealant-filled joints, including control, contraction, and isolation joints, where indicated during installation of setting materials, mortar beds, and tile. Do not saw-cut joints after installing tiles.

1. Locate joints in tile surfaces directly above joints in concrete substrates.
2. Prepare joints and apply sealants to comply with requirements in Division 7 Section "Joint Sealants."

H. Grout tile to comply with requirements of the following tile installation standards:

1. For ceramic tile grouts (sand-portland cement; dry-set, commercial portland cement; and latex-portland cement grouts), comply with ANSI A108.10.
2. For chemical-resistant epoxy grouts, comply with ANSI A108.6.
3. For chemical-resistant furan grouts, comply with ANSI A108.8.

I. Install cementitious backer units and treat joints to comply with ANSI A108.11 and manufacturer's written instructions for type of application indicated.

3.4 WATERPROOFING INSTALLATION

- A. Install waterproofing to comply with ANSI A108.13 and manufacturer's written instructions to produce waterproof membrane of uniform thickness and bonded securely to substrate.
- B. Do not install tile or setting materials over waterproofing until waterproofing has cured and been tested to determine that it is watertight.

3.5 CRACK ISOLATION MEMBRANE INSTALLATION

- A. Install crack isolation membrane to comply with ANSI A108.17 and manufacturer's written instructions to produce membrane of uniform thickness and bonded securely to substrate.

3.6 WALL TILE INSTALLATION

- A. Install types of tile designated for wall installations to comply with requirements in the Wall Tile Installation Schedule, including those referencing TCA installation methods and ANSI setting-bed standards.
- B. Joint Widths: Install tile on walls with the following joint widths:
 1. Glazed Wall Tile: 1/16

3.7 CLEANING AND PROTECTING

- A. Cleaning: On completion of placement and grouting, clean all ceramic tile surfaces so they are free of foreign matter.
 1. Remove latex-portland cement grout residue from tile as soon as possible.
 2. Clean grout smears and haze from tile according to tile and grout manufacturer's written instructions, but no sooner than 10 days after installation. Use only cleaners recommended by tile and grout manufacturers and only after determining that cleaners are safe to use by testing on samples of tile and other surfaces to be cleaned. Protect

- metal surfaces and plumbing fixtures from effects of cleaning. Flush surfaces with clean water before and after cleaning.
3. Remove temporary protective coating by method recommended by coating manufacturer that is acceptable to tile and grout manufacturer. Trap and remove coating to prevent it from clogging drains.
- B. When recommended by tile manufacturer, apply coat of neutral protective cleaner to completed tile walls and floors. Protect installed tile work with kraft paper or other heavy covering during construction period to prevent staining, damage, and wear.
 - C. Prohibit foot and wheel traffic from tiled floors for at least seven days after grouting is completed.
 - D. Before final inspection, remove protective coverings and rinse neutral cleaner from tile surfaces.

END OF SECTION 09 31 00

SECTION 09 51 23 - ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes:
 - 1. Acoustical ceiling panels.
 - 2. Acoustical ceiling framing systems.
 - 3. Extruded aluminum perimeter framing.
 - 4. Concealed and exposed suspension systems for ceilings.

1.2 DEFINITIONS

- A. AC: Articulation Class.
- B. CAC: Ceiling Attenuation Class.
- C. LR: Light Reflectance coefficient.
- D. NRC: Noise Reduction Coefficient.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Coordination Drawings: Reflected ceiling plans drawn to scale and coordinating penetrations and ceiling-mounted items. Show the following:
 - 1. Ceiling suspension members.
 - 2. Method of attaching hangers to building structure.
 - a. Furnish layouts for cast-in-place anchors, clips, and other ceiling attachment devices whose installation is specified in other Sections.
 - 3. Ceiling-mounted items including lighting fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
 - 4. Minimum Drawing Scale: 1/8 inch = 1 foot.
- C. Samples for Initial Selection: For components with factory-applied color finishes.
- D. Samples for Verification: For each component indicated and for each exposed finish required, prepared on Samples of size indicated below.
 - 1. Acoustical Panel: Set of 6-inch- square Samples of each type, color, pattern, and texture.

2. Exposed Suspension System Members, Moldings, and Trim: Set of 12-inch- long Samples of each type, finish, and color.

1.4 QUALITY ASSURANCE

- A. Acoustical Testing Agency Qualifications: An independent testing laboratory, or an NVLAP-accredited laboratory, with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548. NVLAP-accredited laboratories must document accreditation, based on a "Certificate of Accreditation" and a "Scope of Accreditation" listing the test methods specified.
- B. Source Limitations: Obtain each type of acoustical ceiling panel and supporting suspension system through one source from a single manufacturer.
- C. Fire-Test-Response Characteristics: Provide acoustical panel ceilings that comply with the following requirements:
 1. Fire-Resistance Characteristics: Where indicated, provide acoustical panel ceilings identical to those of assemblies tested for fire resistance per ASTM E 119 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction.
 - a. Fire-Resistance Ratings: Indicated by design designations from UL's "Fire Resistance Directory" or from the listings of another testing and inspecting agency.
 - b. Identify materials with appropriate markings of applicable testing and inspecting agency.
 2. Surface-Burning Characteristics: Provide acoustical panels with the following surface-burning characteristics complying with ASTM E 1264 for Class A materials as determined by testing identical products per ASTM E 84:

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Before installing acoustical panels, permit them to reach room temperature and a stabilized moisture content.
- C. Handle acoustical panels carefully to avoid chipping edges or damaging units in any way.

1.6 PROJECT CONDITIONS

- A. Environmental Limitations: Do not install acoustical panel ceilings until spaces are enclosed and weatherproof, wet work in spaces is complete and dry, work above ceilings is complete, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.

1.7 COORDINATION

- A. Coordinate layout and installation of acoustical panels and suspension system with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identification with labels describing contents and ACT label # used in Construction Documents (RCPs).
 - 1. Acoustical Ceiling Tiles: Full-size panels equal to 5 percent of quantity installed of each type.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where titles below introduce lists, the following requirements apply for product selection:
 - 1. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products specified.

2.2 ACOUSTICAL PANELS, GENERAL

- A. Acoustical Panel Standard: Provide manufacturer's standard panels of configuration indicated that comply with ASTM E 1264 classifications as designated by types, patterns, acoustical ratings, and light reflectances, unless otherwise indicated.
 - 1. Mounting Method for Measuring NRC: Type E-400; plenum mounting in which face of test specimen is 15-3/4 inches away from test surface per ASTM E 795.
- B. Recycled Content: Provide acoustical ceiling panels with minimum 50 percent recycled content; provide steel with minimum 25 percent post-consumer recycled content.
- C. Acoustical ceiling panels and suspension system: Comply with emissions requirements of CDPH Standard Test Method in Section 018113.
- D. Ceilings in Core Learning Spaces: Minimum Noise Reduction Coefficient (NRC) of 0.70
- E. Acoustical Panel Colors and Patterns: Match appearance characteristics indicated for each product type.
 - 1. Where appearance characteristics of acoustical panels are indicated by referencing pattern designations in ASTM E 1264 and not manufacturers' proprietary product designations, provide products selected by Architect from each manufacturer's full range that comply with requirements indicated for type, pattern, color, light reflectance, acoustical performance, edge detail, and size.

2.3 PANELS FOR ACOUSTICAL TILE CEILINGS:

- A. Manufacturers:
 - 1. Armstrong World Industries
 - a. No Substitutions
- B. Products:
 - 1. Armstrong Ultima Acoustical Panels- 2x4, Square Lay-In, 24 by 48 inch. Product number 1915LEC; 895; 896
 - a. NRC Rating: 0.75
 - b. CAC Rating: 35
 - c. AC Rating: 170
 - d. Color: White
 - e.

2.4 METAL SUSPENSION SYSTEMS, GENERAL

- A. Metal Suspension System Standard: Provide manufacturer's standard direct-hung metal suspension systems of types, structural classifications, and finishes indicated that comply with applicable requirements in ASTM C 635.
- B. Finishes and Colors, General: Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Provide manufacturer's standard factory-applied finish for type of system indicated.
- C. Wire Hangers, Braces, and Ties: Provide wires complying with the following requirements:
 - 1. Zinc-Coated Carbon-Steel Wire: ASTM A 641, Class 1 zinc coating, soft temper.
 - 2. Nickel-Copper-Alloy Wire: ASTM B 164, nickel-copper-alloy UNS No. N04400.
 - 3. Size: Select wire diameter so its stress at three times hanger design load (ASTM C 635, Table 1, "Direct Hung") will be less than yield stress of wire, but provide not less than 0.106-inch- diameter wire.
- D. Hold-Down Clips: Where indicated, provide manufacturer's standard hold-down clips spaced 24 inches o.c. on all cross tees.

2.5 METAL SUSPENSION SYSTEM FOR STANDARD TILE ACOUSTICAL PANEL CEILINGS

- A. Products:
 - 1. USG Corporation; Donne 15/16" exposed tee grid for Acoustical Panel Ceilings.
 - 2. No substitutions
- B. Wide-Face, Capped, Double-Web, Suspension System: Main and cross runners roll formed from cold-rolled steel sheet, prepainted, electrolytically zinc coated, or hot-dip galvanized according to ASTM A 653, not less than G30 coating designation, with prefinished 15/16-inch-wide metal caps on flanges.
 - 1. Structural Classification: Heavy -duty system.
 - 2. End Condition of Cross Runners: Butt-edge type.
 - 3. Face Design: Flat, flush.
 - 4. Cap Material: Steel cold-rolled sheet.

5. Coordinate finish with metal type selected.
6. Cap Finish: Painted.

2.6 METAL EDGE MOLDINGS AND TRIM

- A. Manufacturers:
 1. USG Interiors, Inc. (Basis-of-Design)
- B. Roll-Formed Sheet-Metal Edge Moldings and Trim: Type and profile indicated or, if not indicated, manufacturer's standard moldings for edges and penetrations that fit acoustical panel edge details and suspension systems indicated; formed from sheet metal of same material, finish, and color as that used for exposed flanges of suspension system runners.
 1. For lay-in panels with reveal edge details, use standard edge moulding and kerf tile to reveal of same depth and width as that formed between edge of panel and flange at exposed suspension member.
 2. For circular penetrations of ceiling, provide edge moldings fabricated to diameter required to fit penetration exactly.
 3. For narrow-face suspension systems, provide suspension system and manufacturer's standard edge moldings that match width and configuration of exposed runners.
- C. Extruded aluminum Edge Mouldings: Provide manufacturer's product in profile indicated on Drawings, or if not indicated provide minimum 8" height fascia profile.

2.7 ACOUSTICAL SEALANT

- A. Products:
 1. Acoustical Sealant for Exposed and Concealed Joints:
 - a. Pecora Corp; AC-20 FTR Acoustical and Insulation Sealant.
 - b. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
 2. Acoustical Sealant for Concealed Joints:
 - a. OSI Sealants, Inc.; Pro-Series SC-170 Rubber Base Sound Sealant.
 - b. OSI Sealants, Inc.; Pro-Series SC-175 Rubber Base Sound Sealant.
 - c. Pecora Corp.; BA-98.
 - d. Tremco, Inc.; Tremco Acoustical Sealant.
- B. Acoustical Sealant for Exposed and Concealed Joints: Manufacturer's standard nonsag, paintable, nonstaining latex sealant, with a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24), complying with ASTM C 834 and effective in reducing airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, including structural framing to which acoustical panel ceilings attach or abut, with Installer present, for compliance with requirements specified in this and other Sections that affect ceiling installation and anchorage and with requirements

for installation tolerances and other conditions affecting performance of acoustical panel ceilings.

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

3.2 PREPARATION

- A. Measure each ceiling area and establish layout of acoustical panels to balance border widths at opposite edges of each ceiling. Avoid using less-than-half-width panels at borders, and comply with layout shown on reflected ceiling plans.

3.3 INSTALLATION, GENERAL

- A. General: Install acoustical panel ceilings to comply with ASTM C 636 and seismic requirements indicated, per manufacturer's written instructions and Cisca's "Ceiling Systems Handbook."

- B. Suspend ceiling hangers from building's structural members and as follows:

1. Install hangers plumb and free from contact with insulation or other objects within ceiling plenum that are not part of supporting structure or of ceiling suspension system.
2. Splay hangers only where required to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
3. Splay hangers only where required and, if permitted with fire-resistance-rated ceilings, to miss obstructions; offset resulting horizontal forces by bracing, countersplaying, or other equally effective means.
4. Where width of ducts and other construction within ceiling plenum produces hanger spacings that interfere with location of hangers at spacings required to support standard suspension system members, install supplemental suspension members and hangers in form of trapezes or equivalent devices. Size supplemental suspension members and hangers to support ceiling loads within performance limits established by referenced standards and publications.
5. Secure wire hangers to ceiling suspension members and to supports above with a minimum of three tight turns. Connect hangers directly either to structures or to inserts, eye screws, or other devices that are secure and appropriate for substrate and that will not deteriorate or otherwise fail due to age, corrosion, or elevated temperatures.
6. Secure flat, angle, channel, and rod hangers to structure, including intermediate framing members, by attaching to inserts, eye screws, or other devices that are secure and appropriate for both structure to which hangers are attached and type of hanger involved. Install hangers in a manner that will not cause them to deteriorate or fail due to age, corrosion, or elevated temperatures.
7. Do not support ceilings directly from permanent metal forms or floor deck. Fasten hangers to cast-in-place hanger inserts, postinstalled mechanical or adhesive anchors, or power-actuated fasteners that extend through forms into concrete.
8. Do not attach hangers to steel deck tabs.
9. Do not attach hangers to steel roof deck. Attach hangers to structural members.
10. Space hangers not more than 48 inches o.c. along each member supported directly from hangers, unless otherwise indicated; provide hangers not more than 8 inches from ends of each member.

- C. Secure bracing wires to ceiling suspension members and to supports with a minimum of four tight turns. Suspend bracing from building's structural members as required for hangers, without attaching to permanent metal forms, steel deck, or steel deck tabs. Fasten bracing wires into concrete with cast-in-place or postinstalled anchors.

- D. Install edge moldings and trim of type indicated at perimeter of acoustical ceiling area and where necessary to conceal edges of acoustical panels.
 - 1. Apply acoustical sealant in a continuous ribbon concealed on back of vertical legs of moldings before they are installed.
 - 2. Screw attach moldings to substrate at intervals not more than 16 inches o.c. and not more than 3 inches from ends, leveling with ceiling suspension system to a tolerance of 1/8 inch in 12 feet. Miter corners accurately and connect securely.
 - 3. Do not use exposed fasteners, including pop rivets, on moldings and trim.
- E. Install suspension system runners so they are square and securely interlocked with one another. Remove and replace dented, bent, or kinked members.
- F. Install acoustical panels with undamaged edges and fit accurately into suspension system runners and edge moldings. Scribe and cut panels at borders and penetrations to provide a neat, precise fit.
 - 1. Arrange directionally patterned acoustical panels as follows:
 - a. As indicated on reflected ceiling plans.
 - 2. For reveal-edged panels on suspension system runners, install panels with bottom of reveal in firm contact with top surface of runner flanges.
 - 3. Install hold-down clips in areas indicated, in areas required by authorities having jurisdiction, and for fire-resistance ratings; space as recommended by panel manufacturer's written instructions, unless otherwise indicated.

3.4 CLEANING

- A. Clean exposed surfaces of acoustical panel ceilings, including trim, edge moldings, and suspension system members. Comply with manufacturer's written instructions for cleaning and touchup of minor finish damage. Remove and replace ceiling components that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 09 51 23

SECTION 09 65 30 - RESILIENT WALL BASE AND ACCESSORIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

- A. Section Includes:
 - 1. Resilient Base.
 - 2. Resilient Molding Accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Initial Selection: For each type of product indicated.
- C. Samples for Verification: For each type of product indicated, in manufacturer's standard-size Samples but not less than 12 inches (300 mm) long, of each resilient product color, texture, and pattern required.
- D. Product Schedule: For resilient products. Use same designations indicated on Drawings.

1.4 QUALITY ASSURANCE

- A. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
 - 1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.
- B. Comply with emissions requirements of CDPH Standard Test Method in Section 018113

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C).

1.6 PROJECT CONDITIONS

- A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive resilient products during the following time periods:
 - 1. 48 hours before installation.
 - 2. During installation.
 - 3. 48 hours after installation.
- B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).
- C. Install resilient products after other finishing operations, including painting, have been completed.

1.7 EXTRA MATERIALS

- A. Furnish extra materials, from the same product run, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Furnish not less than 5%, of each type, color, pattern, and size of resilient product installed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
 - 1. Johnsonite

2.2 RESILIENT BASE

- A. Resilient Base (Basis-of-Design: Johnsonite)
 - 1. Resilient Base Standard: ASTM F 1861.
 - 2. Type (Material Requirement): TV (vinyl).
 - 3. Group (Manufacturing Method): II (layered).
 - 4. Style: Cove (with top-set toe).
 - 5. Minimum Thickness: 0.125 inch.
 - 6. Height: 4 inches.
 - 7. Lengths: Cut lengths 48 inches long or coils in manufacturer's standard length.
 - 8. Outside Corners: Field molded.
 - 9. Inside Corners: Field molded.
 - 10. Surface: Smooth
 - 11. Colors: 40 Black

- B. Resilient base installed within the building interior: Comply with emissions requirements of CDPH Standard Test Method in Section 018113.
- C. Recycled Content: If necessary to meet required LEED threshold, provide products with recycled content.

2.3 RESILIENT MOLDING ACCESSORY

- A. Resilient Molding Accessory:
 - 1. Description: Carpet edge for glue-down applications, Reducer strip for resilient floor covering to Sealed concrete, Joiner for tile and carpet.
 - 2. Thickness: 1/8"
- B. Material: Rubber or Vinyl.
- C. Profile and Dimensions: Full range of manufacturer's shapes & sizes.
- D. Color: To be selected by Architect from full range of manufacturer's colors.

2.4 INSTALLATION MATERIALS

- A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic-cement-based formulation provided or approved by manufacturer for applications indicated.
- B. Adhesives:
 - 1. Armstrong S750
 - 2. Or recommended by Base Manufacturer

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.
- B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.
- C. Do not install resilient products until they are same temperature as the space where they are to be installed.
 - 1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
- D. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.3 RESILIENT BASE INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient base.
- B. Apply resilient base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.
- C. Install resilient base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.
- D. Tightly adhere resilient base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.
- E. Do not stretch resilient base during installation.
- F. On masonry surfaces or other similar irregular substrates, fill voids along top edge of resilient base with manufacturer's recommended adhesive filler material.

3.4 RESILIENT ACCESSORY INSTALLATION

- A. Comply with manufacturer's written instructions for installing resilient accessories.
- B. Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of carpet and resilient floor covering that would otherwise be exposed.

3.5 CLEANING AND PROTECTION

- A. Comply with manufacturer's written instructions for cleaning and protection of resilient products.
- B. Perform the following operations immediately after completing resilient product installation:
 - 1. Remove adhesive and other blemishes from exposed surfaces.
 - 2. Sweep and vacuum surfaces thoroughly.
 - 3. Damp-mop surfaces to remove marks and soil.

- C. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.
- D. Floor Polish: Remove soil, visible adhesive, and surface blemishes from resilient stair treads before applying liquid floor polish.
 - 1. Apply manufacturer's recommended coat(s).
- E. Cover resilient products until Substantial Completion.

END OF SECTION 09 65 30

SECTION 09 68 10 - CARPET TILE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes modular construction carpet tile and Walk Off Mat.
- B. Related Sections include the following:
 - 1. Division 9 Section "Resilient Wall Base and Accessories" for resilient wall base and accessories installed with carpet tile.

1.2 SUBMITTALS

- A. Product Data: For each type of product indicated. Include manufacturer's written data on physical characteristics, durability, and fade resistance. Include installation recommendations for each type of substrate.
- B. Shop Drawings: Show the following:
 - 1. Columns, doorways, enclosing walls or partitions, built-in cabinets, and locations where cutouts are required in carpet tiles.
 - 2. Carpet tile type, color, and dye lot.
 - 3. Type of subfloor.
 - 4. Type of installation.
 - 5. Pattern of installation.
 - 6. Pattern type, location, and direction.
 - 7. Pile direction.
 - 8. Type, color, and location of insets and borders.
 - 9. Type, color, and location of edge, transition, and other accessory strips.
 - 10. Transition details to other flooring materials.
- C. Samples: For each of the following products and for each color and texture required. Label each Sample with manufacturer's name, material description, color, pattern, and designation indicated on Drawings and in schedules.
 - 1. Carpet Tile: Full-size Sample.
 - 2. Exposed Edge, Transition, and other Accessory Stripping: 12-inch- (300-mm-) long Samples.
- D. Product Schedule: For carpet tile. Use same designations indicated on Drawings.
- E. Qualification Data: For Installer.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency.
- G. Maintenance Data: For carpet tiles to include in maintenance manuals. Include the following:

1. Methods for maintaining carpet tile, including cleaning and stain-removal products and procedures and manufacturer's recommended maintenance schedule.
2. Precautions for cleaning materials and methods that could be detrimental to carpet tile.

H. Warranty: Special warranty specified in this Section.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: An experienced installer who is certified by the Floor Covering Installation Board or who can demonstrate compliance with its certification program requirements.
- B. Fire-Test-Response Characteristics: Provide products with the critical radiant flux classification indicated in Part 2, as determined by testing identical products per ASTM E 648 by an independent testing and inspecting agency acceptable to authorities having jurisdiction.
- C. Mockups: Before installing carpet tile, build mockups to verify selections made under sample submittals and to demonstrate aesthetic effects and set quality standards for materials and execution.
 1. Approved mockups may become part of the completed Work if undamaged at time of Substantial Completion.
- D. Preinstallation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section "Project Management and Coordination." Review methods and procedures related to carpet tile installation including, but not limited to, the following:
 1. Review delivery, storage, and handling procedures.
 2. Review ambient conditions and ventilation procedures.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Comply with CRI 104, Section 5, "Storage and Handling."

1.5 PROJECT CONDITIONS

- A. Comply with CRI 104, Section 7.2, "Site Conditions; Temperature and Humidity" and Section 7.12, "Ventilation."
- B. Environmental Limitations: Do not install carpet tiles until wet work in spaces is complete and dry, and ambient temperature and humidity conditions are maintained at the levels indicated for Project when occupied for its intended use.
- C. Do not install carpet tiles over concrete slabs until slabs have cured and are sufficiently dry to bond with adhesive and concrete slabs have pH range recommended by carpet tile manufacturer.
- D. Where demountable partitions or other items are indicated for installation on top of carpet tiles, install carpet tiles before installing these items.

1.6 WARRANTY

- A. Special Warranty for Carpet Tiles: Manufacturer's standard form in which manufacturer agrees to repair or replace components of carpet tile installation that fail in materials or workmanship within specified warranty period.
 - 1. Warranty does not include deterioration or failure of carpet tile due to unusual traffic, failure of substrate, vandalism, or abuse.
 - 2. Failures include, but are not limited to, more than 10 percent loss of face fiber, edge raveling, snags, runs, loss of tuft bind strength, dimensional stability, excess static discharge, and delamination.
 - 3. Warranty Period: 15 year wear warranty.

1.7 EXTRA MATERIALS

- A. Furnish extra materials described below, before installation begins, that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Carpet Tile: Full-size units equal to 5 percent of amount installed for each type indicated, but not less than 6 sq. yd.

PART 2 - PRODUCTS

2.1 GENERAL

- A. Carpet: Comply with emissions requirements of CDPH Standard Test Method in Section 01 81 13.
- B. Recycled Content: Provide carpet with recycled content.

2.2 CARPET TILE

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the following listed Basis of Design selections:
 - 1. CPT-1
 - a. Manufacturer: Shaw Contract
 - b. Collection: Ecoworx
 - c. Pattern: TBD by the Owner (Same as Attic Stock)
 - d. Color: TBD by the Owner (Same as Attic Stock)
 - e. Size: 24" x 24"
 - f. Installation: Ashlar
 - g. Location: 1, 5, 6, 7, 356, 355, 356 Offices

2.3 INSTALLATION ACCESSORIES

- A. Trowelable Leveling and Patching Compounds: Latex-modified, hydraulic-cement-based formulation provided or recommended by carpet tile manufacturer.
- B. Adhesives: Water-resistant, mildew-resistant, nonstaining, pressure-sensitive type to suit products and subfloor conditions indicated, that complies with flammability requirements for installed carpet tile and is recommended by carpet tile manufacturer for releasable installation.
 - 1. VOC Limits: Provide adhesives that comply with the following limits for VOC content when tested according to ASTM D 5116:
 - a. Total VOCs: 10.00 mg/sq. m x h.
 - b. Formaldehyde: 0.05 mg/sq. m x h.
 - c. 2-Ethyl-1-Hexanol: 3.00 mg/sq. m x h.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for maximum moisture content, alkalinity range, installation tolerances, and other conditions affecting carpet tile performance. Examine carpet tile for type, color, pattern, and potential defects.
- B. For wood subfloors, verify the following:
 - 1. Underlayment over subfloor complies with requirements specified in Division 6 Section "Rough Carpentry."
 - 2. Underlayment surface is free of irregularities and substances that may interfere with adhesive bond or show through surface.
- C. Concrete Subfloors: Verify that concrete slabs comply with ASTM F 710 and the following:
 - 1. Slab substrates are dry and free of curing compounds, sealers, hardeners, and other materials that may interfere with adhesive bond. Determine adhesion and dryness characteristics by performing bond and moisture tests recommended by carpet tile manufacturer.
 - a. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have maximum 75 percent relative humidity level measurement.
 - b. Perform a pH test as recommended by carpet manufacturer. Proceed with installation only after substrates are in within the recommended pH limits.
 - 2. Subfloor finishes comply with requirements specified in Division 3 Section "Cast-in-Place Concrete" for slabs receiving carpet tile.
 - 3. Subfloors are free of cracks, ridges, depressions, scale, and foreign deposits.
- D. For painted subfloors, verify the following:
 - 1. Perform bond test recommended in writing by adhesive manufacturer.

- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. General: Comply with CRI 104, Section 6.2, "Site Conditions; Floor Preparation," and with carpet tile manufacturer's written installation instructions for preparing substrates indicated to receive carpet tile installation.
- B. Use trowelable leveling and patching compounds, according to manufacturer's written instructions, to fill cracks, holes, depressions, and protrusions in substrates. Fill or level cracks, holes and depressions 1/8 inch (3 mm) wide or wider and protrusions more than 1/32 inch (0.8 mm), unless more stringent requirements are required by manufacturer's written instructions.
- C. Remove coatings, including curing compounds, and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, without using solvents. Use mechanical methods recommended in writing by carpet tile manufacturer.
- D. Clean metal substrates of grease, oil, soil and rust, and prime if directed by adhesive manufacturer. Rough sand painted metal surfaces and remove loose paint. Sand aluminum surfaces, to remove metal oxides, immediately before applying adhesive.
- E. Broom and vacuum clean substrates to be covered immediately before installing carpet tile.

3.3 INSTALLATION

- A. General: Comply with CRI 104, Section 14, "Carpet Modules," and with carpet tile manufacturer's written installation instructions.
- B. Installation Method: As recommended in writing by carpet tile manufacturer - install every tile with full-spread, releasable, pressure-sensitive adhesive.
- C. Maintain dye lot integrity. Do not mix dye lots in same area.
- D. Cut and fit carpet tile to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture including cabinets, pipes, outlets, edgings, thresholds, and nosings. Bind or seal cut edges as recommended by carpet tile manufacturer.
- E. Extend carpet tile into toe spaces, door reveals, closets, open-bottomed obstructions, removable flanges, alcoves, and similar openings.
- F. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on finish flooring as marked on subfloor. Use nonpermanent, nonstaining marking device.
- G. Install pattern based on building design and installation efficiencies. Architect to approve layout before installation.
- H. Stagger joints of carpet tiles so carpet tile grid is offset from access flooring panel grid. Do not fill seams of access flooring panels with carpet adhesive; keep seams free of adhesive.

3.4 CLEANING AND PROTECTION

- A. Perform the following operations immediately after installing carpet tile:
 - 1. Remove excess adhesive, seam sealer, and other surface blemishes using cleaner recommended by carpet tile manufacturer.
 - 2. Remove yarns that protrude from carpet tile surface.
 - 3. Vacuum carpet tile using commercial machine with face-beater element.
- B. Protect installed carpet tile to comply with CRI 104, Section 16, "Protection of Indoor Installations."
- C. Protect carpet tile against damage from construction operations and placement of equipment and fixtures during the remainder of construction period. Use protection methods indicated or recommended in writing by carpet tile manufacturer.

END OF SECTION 09 68 10

SECTION 09 91 00 - PAINTING

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes surface preparation and field painting of exposed exterior and interior items and surfaces.
 - 1. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- B. Paint exposed surfaces, except where these Specifications indicate that the surface or material is not to be painted or is to remain natural. If an item or a surface is not specifically mentioned, paint the item or surface the same as similar adjacent materials or surfaces. If a color of finish is not indicated, Architect will select from standard colors and finishes available.
 - 1. Painting includes field painting of exposed bare and covered pipes and ducts (including color coding), hangers, exposed steel and iron supports, and surfaces of mechanical and electrical equipment that do not have a factory-applied final finish.
- C. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.
- D. Related Sections include the following:
 - 1. Division 8 Section "Steel Doors and Frames" for factory priming steel doors and frames.
 - 2. Division 9 Section "Gypsum Board" for surface preparation of gypsum board.

1.2 DEFINITIONS

- A. General: Standard coating terms defined in ASTM D 16 apply to this Section.
 - 1. Flat refers to a lusterless or matte finish with a gloss range below 15 when measured at an 85-degree meter.
 - 2. Eggshell refers to low-sheen finish with a gloss range between 20 and 35 when measured at a 60-degree meter.
 - 3. Semi-Gloss refers to medium-sheen finish with a gloss range between 35 and 70 when measured at a 60-degree meter.
 - 4. Full gloss refers to high-sheen finish with a gloss range more than 70 when measured at a 60-degree meter.

1.3 SUBMITTALS

- A. Product Data: For each paint system indicated. Include block fillers and primers.

1. Material List: An inclusive list of required coating materials. Indicate each material and cross-reference specific coating, finish system, and application. Identify each material by manufacturer's catalog number and general classification.
 2. Manufacturer's Information: Manufacturer's technical information, including label analysis and instructions for handling, storing, and applying each coating material.
- B. Samples for Initial Selection: For each type of finish-coat material indicated.
1. After color selection, Architect will furnish color chips for surfaces to be coated.
- C. Samples for Verification: For each color and material to be applied, with texture to simulate actual conditions, on representative Samples of the actual substrate.
1. Provide stepped Samples, defining each separate coat, including block fillers and primers. Use representative colors when preparing Samples for review. Resubmit until required sheen, color, and texture are achieved.
 2. Provide a list of materials and applications for each coat of each Sample. Label each Sample for location and application.
- D. Qualification Data: For Applicator.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: A firm or individual experienced in applying paints and coatings similar in material, design, and extent to those indicated for this Project, whose work has resulted in applications with a record of successful in-service performance.
- B. Source Limitations: Obtain block fillers and primers for each coating system from the same manufacturer as the finish coats.
- C. Benchmark Samples (Mockups): Provide a full-coat benchmark finish sample for each type of coating and substrate required. Comply with procedures specified in PDCA P5. Duplicate finish of approved sample Submittals.
1. Architect will select one room or surface to represent surfaces and conditions for application of each type of coating and substrate for evaluation of quality of finish coat and paint adhesion.
 - a. Wall Surfaces: Provide samples on at least 100 sq. ft.
 - b. Small Areas and Items: Architect will designate items or areas required.
 2. Apply benchmark samples, according to requirements for the completed Work, after permanent lighting and other environmental services have been activated. Provide required sheen, color, and texture on each surface.
 - a. After finishes are accepted, Architect will use the room or surface to evaluate coating systems of a similar nature.
 3. Final approval of colors will be from benchmark samples.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label and the following information:
 - 1. Product name or title of material.
 - 2. Product description (generic classification or binder type).
 - 3. Manufacturer's stock number and date of manufacture.
 - 4. Contents by volume, for pigment and vehicle constituents.
 - 5. Thinning instructions.
 - 6. Application instructions.
 - 7. Color name and number.
 - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well-ventilated area at a minimum ambient temperature of 45 deg F. Maintain storage containers in a clean condition, free of foreign materials and residue.
 - 1. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily.

1.6 PROJECT CONDITIONS

- A. Apply waterborne paints only when temperatures of surfaces to be painted and surrounding air are between 50 and 90 deg F.
- B. Apply solvent-thinned paints only when temperatures of surfaces to be painted and surrounding air are between 45 and 95 deg F.
- C. Do not apply paint in snow, rain, fog, or mist; or when relative humidity exceeds 85 percent; or at temperatures less than 5 deg F above the dew point; or to damp or wet surfaces.
 - 1. Painting may continue during inclement weather if surfaces and areas to be painted are enclosed and heated within temperature limits specified by manufacturer during application and drying periods.

1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Paint Products: 2 gallons of each material and color applied.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products listed in other Part 2 articles.
1. Benjamin Moore & Co. (Benjamin Moore).
 2. PPG Industries, Inc. (Pittsburgh Paints).
 3. Sherwin-Williams Co. (Sherwin-Williams), Basis of Design.

2.2 PAINT MATERIALS, GENERAL

- A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- B. Interior wet-applied paints and coatings: Comply with emissions requirements of CDPH Standard Test Method and VOC content limits in Section 018113.
- C. Prohibit Methylene chloride, lead, cadmium, and perchloroethylene in paints and coatings.
- D. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.
1. Proprietary Names: Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- E. Colors: As selected by Architect from manufacturer's full range. Refer to Part 3.
1. Anticipate **up to 3 interior colors** for conventional paint products. Gypsum Ceilings & Bulkheads to be Flat finish, Gypsum Walls to be Eggshell finish, Block walls to be Semi-Gloss finish, and Trim & Metals to be Semi-Gloss finish.

2.3 CONCRETE UNIT MASONRY BLOCK FILLERS

- A. Concrete Unit Masonry Block Filler: Factory-formulated high-performance latex block fillers.
1. Sherwin-Williams; Interior/Exterior Block Filler B25W25: Applied at a dry film thickness of not less than 8.0 mils., Basis of Design.

2.4 INTERIOR PRIMERS

- A. Interior Gypsum Board Primer: Factory-formulated latex-based primer for interior application.

1. Sherwin-Williams; ProMar 200 Zero VOC Latex Wall Primer B28W2600 Series: Applied at a dry film thickness of not less than 1.1 mils., Basis of Design.
- B. Interior Ferrous-Metal Primer: Factory-formulated quick-drying rust-inhibitive alkyd-based metal primer.
 1. Sherwin-Williams; Pro Industrial Pro-Cryl Universal Metal Primer B66-310: Applied at a dry film thickness of not less than 3.0 mils., Basis of Design.

2.5 INTERIOR FINISH COATS

- A. New Interior Gypsum Board Ceiling: Factory-formulated latex-based Flat finish for interior application.
 1. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Flat, B30 Series: Applied at a dry film thickness of not less than 1.7 mils., Basis of Design.
- B. Interior Low-Luster Acrylic Enamel: Factory-formulated Eggshell acrylic-latex interior enamel.
 1. Sherwin-Williams; ProMar 200 Zero VOC Interior Latex Eg-Shel, B20W2651 Series: Applied at a dry film thickness of not less than 1.7 mils., Basis of Design.
- C. Interior Low-Luster Waterbased Epoxy for Areas subject to Frequent Cleanings, & Rest Room Wet Wall Areas: Factory-formulated Eg-Shel Water Based Epoxy.
 1. Sherwin-Williams; PRO Industrial Pre-Catalyzed Waterbased Epoxy, Eg-Shel, K45-1150 series: Applied at a dry film thickness of not less than 1.5 mils., Basis of Design.
- D. Interior Semi-Gloss Waterbased Epoxy for Areas subject to Heavier Abrasion: Factory-formulated Semi-Gloss Water Based Epoxy for interior application.
 1. Sherwin-Williams; PRO Industrial Pre-Catalyzed Waterbased Epoxy, Semi-Gloss, K46-1150 series: Applied at a dry film thickness of not less than 1.5 mils., Basis of Design.
- E. Interior Semi-Gloss Waterbased Alkyd Urethane Enamel for Ferrous & Galvanized Metal: Factory-formulated Semi-Gloss acrylic-latex enamel for interior application.
 1. Sherwin-Williams; Pro Industrial Acrylic Coating Semi-Gloss, B66-650 Series: Applied at a dry film thickness of not less than 1.4-1.7 mils., Basis of Design.
- F. Interior Eg-Shel Industrial Waterborne Acrylic Dryfall for Metal Decking surfaces:
 1. Sherwin-Williams; Pro Industrial Waterborne Acrylic Dryfall Eg-Shel, B42W82 series: Applied at a dry film thickness of not less than 1.9-2.9 mils., Basis of Design.

2.6 FLOOR SEALERS

- A. Non-Reactive Concrete Finish System
 1. Gloss Waterbased Finish: Sherwin Williams; Armorseal 8100 Waterbased Epoxy Gloss Clear, Basis of Design

- B. Interior Clear Polyurethane Finish
 - 1. Sherwin Williams Armorseal 8100 Waterbased Epoxy Satin, Basis of Design

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.
 - 1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
 - 2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
- B. Coordination of Work: Review other Sections in which primers are provided to ensure compatibility of the total system for various substrates. On request, furnish information on characteristics of finish materials to ensure use of compatible primers.
 - 1. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.2 PREPARATION

- A. General: Remove hardware and hardware accessories, plates, machined surfaces, lighting fixtures, and similar items already installed that are not to be painted. If removal is impractical or impossible because of size or weight of the item, provide surface-applied protection before surface preparation and painting.
 - 1. After completing painting operations in each space or area, reinstall items removed using workers skilled in the trades involved.
- B. Cleaning: Before applying paint or other surface treatments, clean substrates of substances that could impair bond of the various coatings. Remove oil and grease before cleaning.
 - 1. Schedule cleaning and painting so dust and other contaminants from the cleaning process will not fall on wet, newly painted surfaces.
- C. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer's written instructions for each particular substrate condition and as specified.
 - 1. Provide barrier coats over incompatible primers or remove and reprime.
 - 2. Cementitious Materials: Prepare concrete, concrete unit masonry, cement plaster, and mineral-fiber-reinforced cement panel surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation.
 - a. Use abrasive blast-cleaning methods if recommended by paint manufacturer.

- b. Determine alkalinity and moisture content of surfaces by performing appropriate tests. If surfaces are sufficiently alkaline to cause the finish paint to blister and burn, correct this condition before application. Do not paint surfaces if moisture content exceeds that permitted in manufacturer's written instructions.
 - c. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
- 3. Wood: Clean surfaces of dirt, oil, and other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth and dust off.
 - a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After priming, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand smooth when dried.
 - b. Prime, stain, or seal wood to be painted immediately on delivery. Prime edges, ends, faces, undersides, and back sides of wood, including cabinets, counters, cases, and paneling.
 - c. If transparent finish is required, backprime with spar varnish.
 - d. Backprime paneling on interior partitions where masonry, plaster, or other wet wall construction occurs on back side.
 - e. Seal tops, bottoms, and cutouts of unprimed wood doors with a heavy coat of varnish or sealer immediately on delivery.
- 4. Ferrous Metals: Clean ungalvanized ferrous-metal surfaces that have not been shop coated; remove oil, grease, dirt, loose mill scale, and other foreign substances. Use solvent or mechanical cleaning methods that comply with SSPC's recommendations.
 - a. Power Tool Clean steel surfaces as recommended by paint system manufacturer and according to SSPC-SP 3.
 - b. Treat bare and sandblasted or pickled clean metal with a metal treatment wash coat before priming.
 - c. Touch up bare areas and shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with same primer as the shop coat.
- 5. Galvanized Surfaces: Clean galvanized surfaces with nonpetroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- D. Material Preparation: Mix and prepare paint materials according to manufacturer's written instructions.
 - 1. Maintain containers used in mixing and applying paint in a clean condition, free of foreign materials and residue.
 - 2. Stir material before application to produce a mixture of uniform density. Stir as required during application. Do not stir surface film into material. If necessary, remove surface film and strain material before using.
 - 3. Use only thinners approved by paint manufacturer and only within recommended limits.

- E. Tinting: Tint each undercoat a lighter shade to simplify identification of each coat when multiple coats of same material are applied. Tint undercoats to match the color of the finish coat, but provide sufficient differences in shade of undercoats to distinguish each separate coat.

3.3 APPLICATION

- A. General: Apply paint according to manufacturer's written instructions. Use applicators and techniques best suited for substrate and type of material being applied.
 - 1. Do not paint over dirt, rust, scale, grease, moisture, scuffed surfaces, or conditions detrimental to formation of a durable paint film.
 - 2. Provide finish coats that are compatible with primers used.
 - 3. The term "exposed surfaces" includes areas visible when permanent or built-in fixtures, grilles, convactor covers, covers for finned-tube radiation, and similar components are in place. Extend coatings in these areas, as required, to maintain system integrity and provide desired protection.
 - 4. Paint surfaces behind movable equipment and furniture the same as similar exposed surfaces. Before final installation of equipment, paint surfaces behind permanently fixed equipment or furniture with prime coat only.
 - 5. Paint interior surfaces of ducts with a flat, nonspecular black paint where visible through registers or grilles.
 - 6. Paint back sides of access panels and removable or hinged covers to match exposed surfaces.
 - 7. Finish exterior doors on tops, bottoms, and side edges the same as exterior faces.
 - 8. Finish interior of wall and base cabinets and similar field-finished casework to match exterior.
 - 9. Sand lightly between each succeeding enamel or varnish coat.
- B. Scheduling Painting: Apply first coat to surfaces that have been cleaned, pretreated, or otherwise prepared for painting as soon as practicable after preparation and before subsequent surface deterioration.
 - 1. The number of coats and film thickness required are the same regardless of application method. Do not apply succeeding coats until previous coat has cured as recommended by manufacturer. If sanding is required to produce a smooth, even surface according to manufacturer's written instructions, sand between applications.
 - 2. Omit primer over metal surfaces that have been shop primed and touchup painted.
 - 3. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is of uniform finish, color, and appearance. Give special attention to ensure that edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
 - 4. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, and does not deform or feel sticky under moderate thumb pressure, and until application of another coat of paint does not cause undercoat to lift or lose adhesion.
- C. Application Procedures: Apply paints and coatings by brush, roller, spray, or other applicators according to manufacturer's written instructions.
 - 1. Brushes: Use brushes best suited for type of material applied. Use brush of appropriate size for surface or item being painted.

2. Rollers: Use rollers of carpet, velvet-back, or high-pile sheep's wool as recommended by manufacturer for material and texture required.
 3. Spray Equipment: Use airless spray equipment with orifice size as recommended by manufacturer for material and texture required.
- D. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer's recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.
- E. Mechanical items to be painted are specified to be painted in Division 15.
- F. Electrical items to be painted are specified to be painted in Division 16.
- G. Block Fillers: Apply block fillers to concrete masonry block at a rate to ensure complete coverage with pores filled.
- H. Prime Coats: Before applying finish coats, apply a prime coat, as recommended by manufacturer, to material that is required to be painted or finished and that has not been prime coated by others. Recoat primed and sealed surfaces where evidence of suction spots or unsealed areas in first coat appears, to ensure a finish coat with no burn-through or other defects due to insufficient sealing.
- I. Pigmented (Opaque) Finishes: Completely cover surfaces as necessary to provide a smooth, opaque surface of uniform finish, color, appearance, and coverage. Cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections will not be acceptable.
- J. Transparent (Clear) Finishes: Use multiple coats to produce a glass-smooth surface film of even luster. Provide a finish free of laps, runs, cloudiness, color irregularity, brush marks, orange peel, nail holes, or other surface imperfections.
1. Provide satin finish for final coats.
- K. Stipple Enamel Finish: Roll and redistribute paint to an even and fine texture. Leave no evidence of rolling, such as laps, irregularity in texture, skid marks, or other surface imperfections.
- L. Completed Work: Match approved samples for color, texture, and coverage. Remove, refinish, or repaint work not complying with requirements.

3.4 FIELD QUALITY CONTROL

- A. Owner reserves the right to invoke the following test procedure at any time and as often as Owner deems necessary during the period when paint is being applied:
1. Owner will engage a qualified independent testing agency to sample paint material being used. Samples of material delivered to Project will be taken, identified, sealed, and certified in the presence of Contractor.
 2. Owner may direct Contractor to stop painting if test results show material being used does not comply with specified requirements. Contractor shall remove noncomplying paint from Project site, pay for testing, and repaint surfaces previously coated with the noncomplying

paint. If necessary, Contractor may be required to remove noncomplying paint from previously painted surfaces if, on repainting with specified paint, the two coatings are incompatible.

3.5 CLEANING

- A. Cleanup: At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from Project site.
 - 1. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping without scratching or damaging adjacent finished surfaces.

3.6 PROTECTION

- A. Protect work of other trades, whether being painted or not, against damage from painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. After completing painting operations, remove temporary protective wrappings provided by others to protect their work.
 - 1. After work of other trades is complete, touch up and restore damaged or defaced painted surfaces. Comply with procedures specified in PDCA P1.

3.7 INTERIOR PAINT SCHEDULE

- A. Concrete Unit Masonry: Provide the following finish systems over interior concrete masonry:
 - 1. Water Based Pre-Catalyzed Epoxy – Eg-Shel: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Interior Waterbased Pre-Catalyzed Epoxy, Eg-Shel.
 - c. Location: Rest Rooms above Ceramic Tile Wainscot
 - 2. Water Based Pre-Catalyzed Epoxy – Semi-Gloss: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Interior Waterbased Pre-Catalyzed Epoxy, Semi-Gloss.
 - c. Location: Multi-purpose/Gym & Lobby Walls
- B. Gypsum Board: Provide the following finish systems over interior gypsum board surfaces:
 - 1. Low-Luster / Eg-Shel Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior gypsum board primer.
 - b. Finish Coats for Walls: Interior low-luster / Eg-Shel acrylic enamel.
 - c. Finish Coats for Ceilings: Interior Flat acrylic
- C. Ferrous Metal: Provide the following finish systems over ferrous metal:

1. Semigloss Waterbased Alkyd Urethane Finish: Two finish coats over a primer.

- a. Primer: Interior ferrous-metal primer.
- b. Finish Coats: Waterbased Alkyd Urethane Semi-Gloss Enamel.

D. Zinc-Coated Metal (not decking): Provide the following finish systems over interior zinc-coated metal surfaces:

1. Semigloss Waterbased Alkyd Urethane Finish: Two finish coats over a primer.

- a. Primer: Interior zinc-coated metal primer.
- b. Finish Coats: Waterbased Alkyd Urethane Semi-Gloss Enamel.

E. Bare Concrete Floor:

- 1. Gloss Water-based Sealer: Provide two finish coats on fully cured concrete floors:
 - a. Water-based Clear Sealer

3.8 INTERIOR PAINT COLORS:

A. PT-1

- 1. Manufacturer: Sherwin Williams
- 2. Collection: Promar 200 Zero VOC
- 3. Color: SW 6038
- 4. Name: Truly Taupe
- 5. Sheen: Eggshell
- 6. Location: Soffit

B. PT-2

- 1. Manufacturer: Sherwin Williams
- 2. Collection: Promar 200 Zero VOC
- 3. Color: SW 6071
- 4. Name: Popular Gray
- 5. Sheen: Eggshell
- 6. Location: Typical Wall/Ceiling

C. PT-3

- 1. Manufacturer: Sherwin Williams
- 2. Color: SW 6258
- 3. Name: Iron Ore
- 4. Sheen: Semi-Gloss
- 5. Location: Hollow Metal Doors and Frames; Trim

END OF SECTION 09 91 00

SECTION 10 26 41 – BULLET RESISTANT PANELS

PART 1 – GENERAL

1.1 SUMMARY

- A. Section includes bullet resistant fiberglass panels.

1.2 REFERENCES

- A. American Society for Testing and Materials:
 - 1. ASTM E119-98 Standard Test for One-Hour Fire-Rating of Building Construction and Materials
 - 2. ASTM F1233-98 Standard Test Method for Forced Entry Testing of Materials/Assemblies, Class IV
- B. International Organization for Standardization:
 - 1. ISO 9001:2015 Quality Management System
- C. National Institute of Justice Ballistic Standards:
 - 1. NIJ Standard 0108.01 – Type III-A
- D. Small Business Administration:
 - 1. SBA Small Business Size Standard
- E. Underwriters Laboratories:
 - 1. UL 752 Specifications and Ammunition, 11th Edition, Standard for Bullet Resisting Equipment published September 9, 2005, revised December 21, 2006, Level 3
- F. The United States Department of State:
 - 1. The International Traffic in Arms Regulations (ITAR)

1.3 SUBMITTALS

- A. Submittals for Review: Submit for approval prior to fabrication.
 - 1. Product Data: Include specifications, brochures, and samples.
 - 2. Recommendations for installation of Bullet Resistant Fiberglass Panels available in print document and video link.
- B. Certificates: Submit printed data to indicate compliance with following requirements.
 - 1. UL LISTING Verification and UL752 Current Test Results as provided by Underwriters Laboratories.
 - 2. ASTM E119-98 One-Hour Fire Rating of Building Construction and Materials.
 - 3. ASTM F1233-98 Standard Test Method for Forced Entry Testing of Materials/Assemblies.
 - 4. Manufacturer's third party certificate of registration with ISO 9001:2015.
 - 5. Manufacturer's U.S. Dept. of State ITAR Statement of Registration.
 - 6. Manufacturer's SBA Profile verifying small business status by the SBA.

1.4 DELIVERY, HANDLING, AND STORAGE

- A. Deliver materials to project with manufacturer's UL LISTED Labels intact and legible.
- B. Handle material with care to prevent damage. Store materials inside under cover, stack flat and off the floor.

1.5 WARRANTY

- A. Warrant all materials and workmanship against defects for a period of ten (10) years from the date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURER

- A. Design Basis: Contract Documents are based on ArmorCore by Waco Composites, (Waco, TX 76710, phone: 254-752-3622, toll free: 866-688-3088, email: sales@armorcore.com, web: www.armorcore.com)

2.2 PERFORMANCE CRITERIA

- A. Bullet Resistant Fiberglass Panels shall be “non ricochet type” to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.
- B. Panel Rating: UL752 Level 3.
- C. Bullet resistance of joints: equal to that of the panel.

2.3 MATERIALS

- A. Panels fabricated of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets.
- B. Thickness: 7/16” nominal thickness
- C. Nominal Weight: 4.8 lbs. per sq. ft.
- D. Available Panel Sizes: 4' x 8'
- E. Panels manufactured in the United States of America with raw materials sourced from the U.S.A. for quality assurance purposes and to comply with any applicable “Buy American” provisions.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Prior to starting installation, verify work of related trades required in contract documents and architectural drawings is complete to the point where work of this Section may properly commence.

3.2 JOINTS

- A. Reinforce joints with a back-up layer of bullet resistive material. Minimum width of reinforcing layer at joint shall be 4-inches, centered on panel joints.

3.3 APPLICATION

- A. Install armor in accordance with manufacturer’s printed recommendations and as required by contract documents.
- B. Secure armor panels using screws, bolts, or an industrial adhesive.
 - 1. Method of application shall install panels minimizing vulnerabilities by fitting tightly to adjacent surfaces including concrete floor slab, concrete roof slab, bullet resistive door frames, bullet resistive window frames, and the like.

END OF SECTION 10 26 41

BULLET RESISTANT PANELS

10 26 41 - 2

SECTION 10 50 50 - METAL LOCKERS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Multi- tier welded lockers.

1.2 SUBMITTALS

- A. Product data.
- B. Shop Drawings: Include plans, elevations, sections, details, attachments to other work, and locker identification system and numbering sequence.
- C. Samples: For each color specified.
- D. Sample warranties.

1.3 CLOSEOUT SUBMITTALS

- A. Maintenance data.

1.4 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of metal lockers that fail in materials or workmanship, excluding finish, within specified warranty period.
 - 1. Warranty Period for Welded Metal Lockers: 10 years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Accessibility Requirements: For lockers indicated to be accessible, comply with applicable provisions in [the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines and ICC A117.1.
- B. Recycled Content: Provide steel with at least 25 percent post-consumer recycled content.
- C. Product needs to be manufactured and shipped from the United States.

2.2 WELDED LOCKERS

1. Basis-of-Design Product: Penco Products, Inc; All-Welded Ventilated; Vanguard;

Subject to compliance with requirements, provide comparable product by one of the following:
 2. Art Metal Products; Bulldog Corridor; Champ Corridor; Champ Corridor Elite.
 3. DeBourgh Mfg. Co; Angle Iron Corridor.
 4. Republic Storage Systems Company.
- B. Locker Arrangement:
 1. Multi- tier: 6-0" Nominal height with 12"d x 12"h x 12" w Lockers, with legs.
- C. Doors: One piece; fabricated from 0.075-inch (1.90-mm) nominal-thickness steel sheet; formed into channel shape with double bend at vertical edges and with right-angle single bend at horizontal edges.
 1. Reinforcement: Manufacturer's standard reinforcing angles, channels, or stiffeners for doors more than 15 inches (381 mm) wide; attached to inner face of doors.
 2. Door Style: hinged
 3. Vented panel as follows:
 - a. Louvered Vents: No fewer than six louver openings at top and bottom and concealed venting at door edge for single-tier.
 - b. Concealed venting at door edge for double tier.
- D. Body: The body of the locker consists of 24 gauge upright sheets, backs, tops, bottoms and shelves. Tops, bottoms and shelves are flanged on all four sides; backs are flanged on two sides. Uprights shall be offset at the front and flanged at the rear to provide a double lapped rear corner. All bolts and nuts shall be zinc plated.
 1. Shelves: 0.060-inch (1.52-mm) nominal thickness, with double bend at front and single bend at sides and back.
- E. Frames: Channel formed; fabricated from 0.060-inch (1.52-mm) nominal-thickness steel sheet; lapped and factory welded at corners; with top and bottom main frames factory attached to vertical main frames. Form continuous, integral, full-height door strikes on vertical main frames.
- F. Hinges:
 1. Hinges: Manufacturer's standard, steel, continuous or knuckle type.
- G. Recessed Door Handle and Latch: Stainless-steel cup with integral door pull, recessed so locking device does not protrude beyond door face; pry and vandal resistant.
 1. Multipoint Latching: Finger-lift latch control designed for use without locks; positive automatic latching.
- H. Door Handle and Latch for Box Lockers: Stainless-steel strike plate with integral pull.
- I. Locks: with keyed locks.
- J. Identification Plates: Manufacturer's standard, etched, embossed, or stamped aluminum plates, with numbers and letters at least 3/8 inch (9 mm) high.

1. Sequence numbering in accordance with Architect's direction as approved by Owner.
- K. Legs: Provide Legs
- L. Continuous Sloping Tops: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet, with a pitch of approximately 20 degrees.
 1. Closures: Vertical-end type.
 2. Locations: as shown on drawings.
- M. Recess Trim: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- N. Filler Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- O. Boxed End Panels: Fabricated from 0.048-inch (1.21-mm) nominal-thickness steel sheet.
- P. Materials:
 1. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B, suitable for exposed applications.
- Q. Finish: Baked enamel or powder coat.
 1. Color: As selected by Architect from manufacturer's full range.
 - a. Basis-of-Design color for corridors: 723 Light Putty

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Install lockers level, plumb, and true; shim as required, using concealed shims.
- B. Knocked-Down Lockers: Assemble with standard fasteners, with no exposed fasteners on door faces or face frames.
- C. Welded Lockers: Connect groups together with standard fasteners, with no exposed fasteners on face frames.
- D. Trim: Fit exposed connections of trim, fillers, and closures accurately together to form tight, hairline joints, with concealed fasteners and splice plates.
 1. Attach recess trim to recessed metal lockers with concealed clips.
 2. Attach filler panels with concealed fasteners.
 3. Attach sloping-top units to metal lockers, with closures at exposed ends.
 4. Seal sloping tops to walls with clear silicone.

END OF SECTION 10 50 50

SECTION 21 05 17 - SLEEVES AND SLEEVE SEALS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Sleeves.
 - 2. Stack-sleeve fittings.
 - 3. Sleeve-seal systems.
 - 4. Sleeve-seal fittings.
 - 5. Grout.
 - 6. Silicone sealants.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.

1.04 INFORMATIONAL SUBMITTALS

- A. Field quality-control reports.

PART 2 - PRODUCTS

2.01 SLEEVES

- A. Cast-Iron Pipe Sleeves: Cast or fabricated of cast or ductile iron and equivalent to ductile-iron pressure pipe, with plain ends and integral waterstop.
- B. Steel Pipe Sleeves: ASTM A 53/A 53M, Type E, Grade B, Schedule 40, anticorrosion coated or galvanized, with plain ends and integral welded waterstop collar.
- C. Galvanized-Steel Sheet Sleeves: 0.0239-inch minimum thickness; round tube closed with welded longitudinal joint.

2.02 STACK-SLEEVE FITTINGS

- A. Description: Manufactured, Dura-coated or Duco-coated or galvanized cast-iron sleeve with integral clamping flange for use in waterproof floors and roofs. Include clamping ring, bolts, and nuts for membrane flashing.
 - 1. Underdeck Clamp: Clamping ring with setscrews.

2.03 SLEEVE-SEAL SYSTEMS

A. Description:

1. Modular sealing-element unit, designed for field assembly, for filling annular space between piping and sleeve.
2. Designed to form a hydrostatic seal of 20 psig minimum.
3. Sealing Elements: EPDM-rubber interlocking links shaped to fit surface of pipe. Include type and number required for pipe material and size.
4. Pressure Plates: Carbon steel or Stainless steel.
5. Connecting Bolts and Nuts: Carbon steel, with corrosion-resistant coating, ASTM B 633 or Stainless steel of length required to secure pressure plates to sealing elements.

2.04 SLEEVE-SEAL FITTINGS

- A. Description: Manufactured plastic, sleeve-type, waterstop assembly made for imbedding in concrete slab or wall.
- B. Plastic or rubber waterstop collar with center opening to match piping OD.

2.05 GROUT

- A. Description: Nonshrink, for interior and exterior sealing openings in non-fire-rated walls or floors.
- B. Standard: ASTM C 1107/C 1107M, Grade B, post-hardening and volume-adjusting, dry, hydraulic-cement grout.
- C. Design Mix: 5000-psi, 28-day compressive strength.
- D. Packaging: Premixed and factory packaged.

2.06 SILICONE SEALANTS

- A. Silicone, S, NS, 25, NT: Single-component, nonsag, plus 25 percent and minus 25 percent movement capability, nontraffic-use, neutral-curing silicone joint sealant, ASTM C 920, Type S, Grade NS, Class 25, Use NT.
- B. Silicone, S, P, 25, T, NT: Single-component, pourable, plus 25 percent and minus 25 percent movement capability, traffic- and nontraffic-use, neutral-curing silicone joint sealant; ASTM C 920, Type S, Grade P, Class 25, Uses T and NT. Grade P Pourable (self-leveling) formulation is for opening in floors and other horizontal surfaces that are not fire rated.
- C. Silicone Foam: Multicomponent, silicone-based liquid elastomers that, when mixed, expand and cure in place to produce a flexible, nonshrinking foam.

PART 3 - EXECUTION

3.01 SLEEVE INSTALLATION

- A. Install sleeves for piping passing through penetrations in floors, partitions, roofs, and walls.

- B. For sleeves that will have sleeve-seal system installed, select sleeves of size large enough to provide 1-inch annular clear space between piping and concrete slabs and walls.
- C. Install sleeves in concrete floors, concrete roof slabs, and concrete walls as new slabs and walls are constructed.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - a. Exception: Extend sleeves installed in floors of mechanical equipment areas or other wet areas 2 inches above finished floor level.
 - 2. Using grout or silicone sealant, seal space outside of sleeves in slabs and walls without sleeve-seal system.
- D. Install sleeves for pipes passing through interior partitions.
 - 1. Cut sleeves to length for mounting flush with both surfaces.
 - 2. Install sleeves that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 3. Seal annular space between sleeve and piping or piping insulation; use joint sealants appropriate for size, depth, and location of joint.
- E. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with fire- and smoke-stop materials. Comply with requirements for firestopping and fill materials specified in Section 078413 "Penetration
- F. Firestopping."

3.02 STACK-SLEEVE-FITTING INSTALLATION

- A. Install stack-sleeve fittings in new slabs as slabs are constructed.
 - 1. Install fittings that are large enough to provide 1/4-inch annular clear space between sleeve and pipe or pipe insulation.
 - 2. Secure flashing between clamping flanges for pipes penetrating floors with membrane waterproofing. Comply with requirements for flashing specified in Section 076200 "Sheet Metal Flashing and Trim."
 - 3. Install section of cast-iron soil pipe to extend sleeve to 2 inches above finished floor level.
 - 4. Extend cast-iron sleeve fittings below floor slab as required to secure clamping ring if ring is specified.
 - 5. Use silicone sealant to seal around the outside of stack-sleeve fittings.
- B. Fire-Resistance-Rated Penetrations, Horizontal Assembly Penetrations, and Smoke Barrier Penetrations: Maintain indicated fire or smoke rating of floors at pipe penetrations. Seal pipe penetrations with fire- or smoke-stop materials. Comply with requirements for firestopping specified in Section 078413 "Penetration Firestopping."

3.03 SLEEVE-SEAL-SYSTEM INSTALLATION

- A. Install sleeve-seal systems in sleeves in exterior concrete walls and slabs-on-grade at service piping entries into building.
- B. Select type, size, and number of sealing elements required for piping material and size and for sleeve ID or hole size. Position piping in center of sleeve. Center piping in penetration, assemble sleeve-seal system components, and install in annular space between piping and sleeve. Tighten bolts against pressure plates that cause sealing elements to expand and make a watertight seal.

3.04 SLEEVE-SEAL-FITTING INSTALLATION

- A. Install sleeve-seal fittings in new walls and slabs as they are constructed.
- B. Assemble fitting components of length to be flush with both surfaces of concrete slabs and walls. Position waterstop flange to be centered in concrete slab or wall.
- C. Secure nailing flanges to concrete forms.
- D. Use grout or silicone sealant, to seal the space around outside of sleeve-seal fittings.

3.05 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Leak Test: After allowing for a full cure, test sleeves and sleeve seals for leaks. Repair leaks and retest until no leaks exist.
- B. Sleeves and sleeve seals will be considered defective if they do not pass tests and inspections.
- C. Prepare test and inspection reports.

3.06 SLEEVE AND SLEEVE-SEAL SCHEDULE

- A. Use sleeves and sleeve seals for the following piping-penetration applications:
 - 1. Exterior Concrete Walls above Grade:
 - a. Piping NPS 6 or Smaller: Cast-iron pipe sleeves or Steel pipe sleeves or Sleeve-seal fittings.
 - 2. Exterior Concrete Walls below Grade:
 - a. Piping Smaller Than NPS 6: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system or Sleeve-seal fittings.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - b. Piping NPS 6 and Larger: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - 3. Concrete Slabs-on-Grade:
 - a. Piping NPS 6 or smaller: Cast-iron pipe sleeves with sleeve-seal system or Steel pipe sleeves with sleeve-seal system or Sleeve-seal fittings.
 - 1) Select sleeve size to allow for 1-inch annular clear space between piping and sleeve for installing sleeve-seal system.
 - 4. Concrete Slabs above Grade:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves or Stack-sleeve fittings or Sleeve-seal fittings.
 - b. Piping NPS 6 and Larger: Steel pipe sleeves or Stack-sleeve fittings.
 - 5. Interior Partitions:
 - a. Piping Smaller Than NPS 6: Steel pipe sleeves.
 - b. Piping NPS 6 and Larger: Galvanized-steel sheet sleeves.

BCDC LOBBY RENOVATION
BALTIMORE COUNTY, MARYLAND
JOB ORDER NUMBER – PROJ-10001187
CONTRACT NUMBER – 25122 PO0

PROJECT MANUAL
100% CONSTRUCTION DOCUMENTS
6-13-2025

END OF SECTION 21 05 17

SECTION 21 05 18 - ESCUTCHEONS FOR FIRE-SUPPRESSION PIPING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Escutcheons.
 - 2. Floor plates.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.01 ESCUTCHEONS

- A. One-Piece, Steel Type: With polished, chrome-plated finish and setscrew fastener.
- B. One-Piece, Stainless-Steel Type: With polished stainless-steel finish.
- C. One-Piece, Cast-Brass Type: With polished, chrome-plated finish and setscrew fastener.
- D. One-Piece, Deep-Pattern Type: Deep-drawn, box-shaped steel or brass with polished, chrome-plated finish and spring-clip fasteners.
- E. One-Piece, Stamped-Steel Type: With polished, chrome-plated finish and spring-clip fasteners.
- F. Split-Plate, Stamped-Steel Type: With polished, chrome-plated finish; concealed and exposed-rivet hinge; and spring-clip fasteners.

2.02 FLOOR PLATES

- A. Split Floor Plates: Steel with concealed hinge.

PART 3 - EXECUTION

3.01 INSTALLATION

- A. Install escutcheons for piping penetrations of walls, ceilings, and finished floors.
- B. Install escutcheons with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.

1. Escutcheons for New Piping:
 - a. Piping with Fitting or Sleeve Protruding from Wall: One-piece, deep pattern.
 - b. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece steel with polished, chrome-plated finish.
 - c. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece cast brass with polished, chrome-plated finish.
 - d. Bare Piping at Wall and Floor Penetrations in Finished Spaces: One-piece stamped steel or split-plate, stamped steel with concealed hinge or split-plate, stamped steel with exposed-rivet hinge with polished, chrome-plated finish.
 - e. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece steel with polished, chrome-plated finish.
 - f. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece cast brass with polished, chrome-plated finish.
 - g. Bare Piping at Ceiling Penetrations in Finished Spaces: One-piece stamped steel or split-plate, stamped steel with concealed hinge or split-plate, stamped steel with exposed-rivet hinge with polished, chrome-plated finish.
 - h. Bare Piping in Unfinished Service Spaces: One-piece steel with polished, chrome-plated finish.
 - i. Bare Piping in Unfinished Service Spaces: One-piece cast brass with polished, chrome-plated or rough-brass finish.
 - j. Bare Piping in Unfinished Service Spaces: One-piece stamped steel or split-plate, stamped steel with concealed hinge or split-plate, stamped steel with exposed-rivet hinge with polished, chrome-plated finish.
- C. Install floor plates for piping penetrations of equipment-room floors.
- D. Install floor plates with ID to closely fit around pipe, tube, and insulation of piping and with OD that completely covers opening.
 1. New Piping: One-piece, floor plate.

3.02 FIELD QUALITY CONTROL

- A. Using new materials, replace broken and damaged escutcheons and floor plates.

END OF SECTION 21 05 18

SECTION 21 05 29 - HANGERS AND SUPPORTS FOR FIRE SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Metal pipe hangers and supports.
 - 2. Fastener systems.
 - 3. Equipment supports.
- B. Related Requirements:
 - 1. Section 055000 "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.
 - 2. Section 210516 "Expansion Fittings and Loops for Fire-Suppression Piping" for pipe guides and anchors.
 - 3. Section 210548 "Vibration and Seismic Controls for Fire-Suppression Piping and Equipment", "Section 210548.13 "Vibration Controls for Fire-Suppression Piping and Equipment" for vibration isolation devices and seismic restraints.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Shop Drawings: Signed and sealed by a qualified professional engineer. Show fabrication and installation details and include calculations for the following:
 - 1. Trapeze pipe hangers.
 - 2. Metal framing systems.
 - 3. Equipment supports.
- C. Delegated-Design Submittal: For trapeze hangers indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
 - 1. Detail fabrication and assembly of trapeze hangers.
 - 2. Include design calculations for designing trapeze hangers.

1.04 INFORMATIONAL SUBMITTALS

- A. Welding certificates.

1.05 QUALITY ASSURANCE

- A. Structural-Steel Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M.
- B. Pipe Welding Qualifications: Qualify procedures and operators according to 2015 ASME Boiler and Pressure Vessel Code, Section IX.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Delegated Design: Engage a qualified professional engineer, as defined in Section 014000 "Quality Requirements," to design trapeze pipe hangers and equipment supports.
- B. Structural Performance: Hangers and supports for fire-suppression piping and equipment shall withstand the effects of gravity loads and stresses within limits and under conditions indicated according to [ASCE/SEI 7]
 - 1. Design supports for multiple pipes, including pipe stands, capable of supporting combined weight of supported systems, system contents, and test water.
 - 2. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.
 - 3. Design seismic-restraint hangers and supports for piping and equipment and obtain approval from authorities having jurisdiction.
- C. NFPA Compliance: Comply with NFPA 13
- D. UL Compliance: Comply with UL 203.

2.02 METAL PIPE HANGERS AND SUPPORTS

- A. Carbon-Steel Pipe Hangers and Supports:
 - 1. Description: Factory-fabricated components, NFPA approved, UL listed, or FM approved for fire-suppression piping support.
 - 2. Galvanized Metallic Coatings: Pregalvanized or hot-dip galvanized.
 - 3. Hanger Rods: Continuous-thread rod, nuts, and washer made of carbon steel, stainless steel .

2.03 FASTENER SYSTEMS

- 1. Mechanical-Expansion Anchors: NFPA-approved, UL-listed, or FM-approved, insert-wedge-type anchors, for use in hardened portland cement concrete; with pull-out, tension, and shear capacities appropriate for supported loads and building materials where used.
- 2. Indoor Applications: Zinc-coated or Stainless steel.
- 3. Outdoor Applications: Stainless steel.

2.04 EQUIPMENT SUPPORTS

- A. Description: NFPA-approved, UL-listed, or FM-approved, welded, shop- or field-fabricated equipment support, made from structural-carbon-steel shapes.

2.05 MATERIALS

- A. Aluminum: ASTM B 221 (ASTM B 221M).
- B. Carbon Steel: ASTM A 1011/A 1011M.
- C. Structural Steel: ASTM A 36/A 36M, carbon-steel plates, shapes, and bars; black and galvanized.

- D. Stainless Steel: ASTM A 240/A 240M.
- E. Grout: ASTM C 1107/C 1107M, factory-mixed and -packaged, dry, hydraulic-cement, nonshrink and nonmetallic grout, suitable for interior and exterior applications.
 - 1. Properties: Nonstaining, noncorrosive, and nongaseous.
 - 2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.

PART 3 - EXECUTION

3.01 APPLICATION

- A. Comply with requirements in Section 078413 "Penetration Firestopping" for firestopping materials and installation, for penetrations through fire-rated walls, ceilings, and assemblies.
- B. Strength of Support Assemblies: Where not indicated, select sizes of components, so strength will be adequate to carry present and future static loads within specified loading limits. Minimum static design load used for strength determination shall be weight of supported components plus 200 lb (90 kg).

3.02 HANGER AND SUPPORT INSTALLATION

- A. Metal Pipe-Hanger Installation: Comply with installation requirements of approvals and listings. Install hangers, supports, clamps, and attachments as required to properly support piping from building structure.
- B. Metal Trapeze Pipe-Hanger Installation: Comply with MSS SP-58. Arrange for grouping of parallel runs of horizontal piping, and support together on field-fabricated trapeze pipe hangers.
 - 1. Pipes of Various Sizes: Support together and space trapezes for smallest pipe size, or install intermediate supports for smaller-diameter pipes as specified for individual pipe hangers.
 - 2. Field fabricate from ASTM A 36/A 36M carbon-steel shapes selected for loads being supported. Weld steel according to AWS D1.1/D1.1M.
- C. Metal Framing System Installation: Arrange for grouping of parallel runs of piping, and support together on field-assembled metal strut systems.
- D. Thermal Hanger-Shield Installation: Install in pipe hanger or shield for insulated piping.
- E. Fastener System Installation:
 - 1. Install mechanical-expansion anchors in concrete, after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions. Install in accordance with approvals and listings.
- F. Install hangers and supports complete with necessary attachments, inserts, bolts, rods, nuts, washers, and other accessories.
- G. Equipment Support Installation: Fabricate from welded-structural-steel shapes.
- H. Install hangers and supports to allow controlled thermal and seismic movement of piping systems, to permit freedom of movement between pipe anchors, and to facilitate action of expansion joints, expansion loops, expansion bends, and similar units.
- I. Install lateral bracing with pipe hangers and supports to prevent swaying.
- J. Install building attachments within concrete slabs or attach to structural steel. Install additional attachments at concentrated loads, including valves, flanges, and strainers, NPS 2-1/2 and larger and at changes in direction of piping. Install concrete inserts before concrete is placed; fasten inserts to forms and install reinforcing bars through openings at top of inserts.

- K. Load Distribution: Install hangers and supports, so that piping live and dead loads and stresses from movement will not be transmitted to connected equipment.
- L. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and to not exceed maximum pipe deflections allowed by ASME B31.9 for building services piping.
- M. Insulated Piping:
 - 1. Attach clamps and spacers to piping.
 - a. Piping Operating Above Ambient Air Temperature: Clamp may project through insulation.
 - b. Piping Operating Below Ambient Air Temperature: Use thermal hanger-shield insert with clamp sized to match OD of insert.
 - c. Do not exceed pipe stress limits allowed by ASME B31.9 for building services piping.
 - 2. Install MSS SP-58, Type 39 protection saddles if insulation without vapor barrier is indicated. Fill interior voids with insulation that matches adjoining insulation.
 - a. Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 3. Install MSS SP-58, Type 40 protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
 - a. Option: Thermal hanger-shield inserts may be used. Include steel weight-distribution plate for pipe NPS 4 and larger if pipe is installed on rollers.
 - 4. Shield Dimensions for Pipe: Not less than the following:
 - a. NPS 1/4 to NPS 3-1/2 : 12 inches long and 0.048 inch thick.
 - b. NPS 4 : 12 inches long and 0.06 inch thick.
 - c. NPS 5 and NPS 6 : 18 inches long and 0.06 inch thick.
 - d. NPS 8 to NPS 14: 24 inches long and 0.075 inch thick.
 - e. NPS 16 to NPS 24: 24 inches long and 0.105 inch thick.
 - 5. Pipes NPS 8 and Larger: Include wood or reinforced calcium-silicate-insulation inserts of length at least as long as protective shield.
 - 6. Thermal Hanger Shields: Install with insulation of same thickness as piping insulation.

3.03 EQUIPMENT SUPPORTS

- A. Fabricate structural-steel stands to suspend equipment from structure overhead or to support equipment above floor.
- B. Grouting: Place grout under supports for equipment and make bearing surface smooth.
- C. Provide lateral bracing, to prevent swaying, for equipment supports.

3.04 METAL FABRICATIONS

- A. Cut, drill, and fit miscellaneous metal fabrications for trapeze pipe hangers and equipment supports.
- B. Fit exposed connections together to form hairline joints. Field weld connections that cannot be shop welded because of shipping size limitations.
- C. Field Welding: Comply with AWS D1.1/D1.1M procedures for shielded, metal arc welding; appearance and quality of welds; and methods used in correcting welding work; and with the following:
 - 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 - 2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.
4. Finish welds at exposed connections, so no roughness shows after finishing and so contours of welded surfaces match adjacent contours.

3.05 ADJUSTING

- A. Hanger Adjustments: Adjust hangers to distribute loads equally on attachments and to achieve indicated slope of pipe.
- B. Trim excess length of continuous-thread hanger and support rods to 1-1/2 inches.

3.06 PAINTING

- A. Touchup: Clean field welds and abraded, shop-painted areas. Paint exposed areas immediately after erecting hangers and supports. Use same materials as those used for shop painting. Comply with SSPC-PA 1 requirements for touching up field-painted surfaces.
 1. Apply paint by brush or spray to provide a minimum dry film thickness of 2.0 mils (0.05 mm).
- B. Touchup: Cleaning and touchup painting of field welds, bolted connections, and abraded, shop-painted areas on miscellaneous metal are specified in 09 spec series "Exterior Painting," "Interior Painting." and "High-Performance Coatings."
- C. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas, and apply galvanizing-repair paint to comply with ASTM A 780/A 780M.

3.07 HANGER AND SUPPORT SCHEDULE

- A. Specific hanger and support requirements are in Sections specifying piping systems and equipment.
- B. Comply with NFPA requirements for pipe-hanger selections and applications that are not specified in piping system Sections.
- C. Use hangers and supports with galvanized metallic coatings for piping and equipment that will not have field-applied finishes.
- D. Use carbon-steel pipe hangers and supports, metal trapeze pipe hangers and metal framing systems and attachments for general service applications.
- E. Use stainless-steel pipe hangers and stainless-steel or corrosion-resistant attachments for hostile environment applications.
- F. Horizontal-Piping Hangers and Supports: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
 1. Adjustable, Steel Clevis Hangers (MSS Type 1): For suspension of non-insulated or insulated, stationary pipes NPS 1/2 to NPS 30.
 2. Steel Pipe Clamps (MSS Type 4): For suspension of NPS 1/2 to NPS 24 if little or no insulation is required.
 3. Adjustable, Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated, stationary pipes NPS 1/2 to NPS 8.
 4. Split Pipe Ring with or without Turnbuckle Hangers (MSS Type 11): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 8.

5. Extension Hinged or Two-Bolt Split Pipe Clamps (MSS Type 12): For suspension of noninsulated, stationary pipes NPS 3/8 to NPS 3.
 6. U-Bolts (MSS Type 24): For support of heavy pipes NPS 1/2 to NPS 30.
 7. Pipe Saddle Supports (MSS Type 36): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate.
 8. Pipe Stanchion Saddles (MSS Type 37): For support of pipes NPS 4 to NPS 36, with steel-pipe base stanchion support and cast-iron floor flange or carbon-steel plate, and with U-bolt to retain pipe.
 9. Adjustable Pipe Saddle Supports (MSS Type 38): For stanchion-type support for pipes NPS 2-1/2 to NPS 36 if vertical adjustment is required, with steel-pipe base stanchion support and cast-iron floor flange.
- G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers NPS 3/4 to NPS 24.
 2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers NPS 3/4 to NPS 24 if longer ends are required for riser clamps.
- H. Hanger-Rod Attachments: Comply with NFPA requirements.
- I. Building Attachments: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel or Malleable-Concrete Inserts (MSS Type 18): For upper attachment to suspend pipe hangers from concrete ceiling.
 2. C-Clamps (MSS Type 23): For structural shapes.
 3. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
- J. Saddles and Shields: Comply with NFPA requirements. Unless otherwise indicated and except as specified in piping system Sections, install the following types:
1. Steel-Pipe-Covering Protection Saddles (MSS Type 39): To fill interior voids with insulation that matches adjoining insulation.
 2. Protection Shields (MSS Type 40): Of length recommended in writing by manufacturer to prevent crushing insulation.
 3. Thermal Hanger-Shield Inserts: For supporting insulated pipe.
- K. Comply with NFPA requirements for trapeze pipe-hanger selections and applications that are not specified in piping system Sections.
- L. Comply with MFMA-103 for metal framing system selections and applications that are not specified in piping system Sections.
- M. Use mechanical-expansion anchors instead of building attachments where required in concrete construction.

END OF SECTION 21 05 29

SECTION 21 05 53 - IDENTIFICATION FOR FIRE-SUPPRESSION PIPING AND EQUIPMENT

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Equipment labels.
 - 2. Warning signs and labels.
 - 3. Pipe labels.
 - 4. Valve tags.
 - 5. Warning tags.

1.03 ACTION SUBMITTALS

- A. Product Data: For each type of product.
- B. Samples: For color, letter style, and graphic representation required for each identification material and device.
- C. Equipment-Label Schedule: Include a listing of all equipment to be labeled and the proposed content for each label.
- D. Valve Schedules: Valve numbering scheme.

PART 2 - PRODUCTS

2.01 EQUIPMENT LABELS

- A. Metal Labels for Equipment:
 - 1. Material and Thickness: Brass, 0.032 inch or stainless steel, 0.025 inch or aluminum, 0.032 inch or anodized aluminum, 0.032 inch thick, with predrilled holes for attachment hardware.
 - 2. Letter Color: Red or White.
 - 3. Background Color: Red or White. Shall be contrasting with letter color.
 - 4. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 - 5. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 - 6. Fasteners: Stainless-steel rivets or self-tapping screws.
 - 7. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- B. Plastic Labels for Equipment:
 - 1. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch or 1/8 inch thick, with predrilled holes for attachment hardware.

2. Letter Color: Red or White.
 3. Background Color: Red or White. Shall be contrasting with letter color.
 4. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
 5. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
 6. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
 7. Fasteners: Stainless-steel rivets or self-tapping screws.
 8. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- C. Label Content: Include equipment's Drawing designation or unique equipment number, Drawing numbers where equipment is indicated (plans, details, and schedules), and the Specification Section number and title where equipment is specified.
- D. Equipment-Label Schedule: For each item of equipment to be labeled, on 8-1/2-by-11-inch bond paper. Tabulate equipment identification number and identify Drawing numbers where equipment is indicated (plans, details, and schedules) and the Specification Section number and title where equipment is specified. Equipment schedule shall be included in operation and maintenance data.

2.02 WARNING SIGNS AND LABELS

- A. Material and Thickness: Multilayer, multicolor, plastic labels for mechanical engraving, 1/16 inch or 1/8 inch thick, with predrilled holes for attachment hardware.
- B. Letter Color: Black.
- C. Background Color: Yellow.
- D. Maximum Temperature: Able to withstand temperatures up to 160 deg F.
- E. Minimum Label Size: Length and width vary for required label content, but not less than 2-1/2 by 3/4 inch.
- F. Minimum Letter Size: 1/4 inch for name of units if viewing distance is less than 24 inches, 1/2 inch for viewing distances up to 72 inches, and proportionately larger lettering for greater viewing distances. Include secondary lettering two-thirds to three-fourths the size of principal lettering.
- G. Fasteners: Stainless-steel rivets or self-tapping screws.
- H. Adhesive: Contact-type permanent adhesive, compatible with label and with substrate.
- I. Label Content: Include caution and warning information, plus emergency notification instructions.

2.03 PIPE LABELS

- A. General Requirements for Manufactured Pipe Labels: Preprinted, color-coded, with lettering indicating service and showing flow direction according to ASME A13.1.
- B. Pretensioned Pipe Labels: Precoiled, semirigid plastic formed to partially cover or cover full circumference of pipe and to attach to pipe without fasteners or adhesive.
- C. Pipe-Label Contents: Include identification of piping service using same designations or abbreviations as used on Drawings, pipe size, and an arrow indicating flow direction.
 1. Flow-Direction Arrows: Integral with piping-system service lettering to accommodate both directions or as separate unit on each pipe label to indicate flow direction.

2. Lettering Size: Size letters according to ASME A13.1 for piping or at least 1/2 inch for viewing distances up to 72 inches and proportionately larger lettering for greater viewing distances.
- D. Pipe-Label Colors:
 1. Background Color: Safety Red.
 2. Letter Color: White.

2.04 VALVE TAGS

- A. Description: Stamped or engraved with 1/4-inch letters for piping-system abbreviation and 1/2-inch numbers.
 1. Tag Material: Brass, 0.032 inch or stainless steel, 0.025 inch or aluminum, 0.032 inch or anodized aluminum, 0.032 inch thick, with predrilled holes for attachment hardware.
 2. Fasteners: Brass wire-link or chain beaded chain or S-hook.
 3. Valve-Tag Color: Safety Red.
 4. Letter Color: White.
- B. Valve Schedules: For each piping system, on 8-1/2-by-11-inch bond paper. Tabulate valve number, piping system, system abbreviation (as shown on valve tag), location of valve (room or space), normal-operating position (open, closed, or modulating), and variations for identification. Mark valves for emergency shutoff and similar special uses.
 1. Valve-tag schedule shall be included in operation and maintenance data.

2.05 WARNING TAGS

- A. Description: Preprinted or partially preprinted, accident-prevention tags, of plasticized card stock with matte finish suitable for writing.
 1. Size: 3 by 5-1/4 inches minimum or approximately 4 by 7 inches.
 2. Fasteners: Brass grommet and wire or Reinforced grommet and wire or string.
 3. Nomenclature: Large-size primary caption such as "DANGER," "CAUTION," or "DO NOT OPERATE."
 4. Color: Safety Yellow background with black lettering.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Clean piping and equipment surfaces of incompatible primers, paints, and encapsulants, as well as dirt, oil, grease, release agents, and other substances that could impair bond of identification devices.

3.02 GENERAL INSTALLATION REQUIREMENTS

- A. Coordinate installation of identifying devices with completion of covering and painting of surfaces where devices are to be installed.
- B. Coordinate installation of identifying devices with locations of access panels and doors.
- C. Install identifying devices before installing acoustical ceilings and similar concealment.

3.03 EQUIPMENT LABEL INSTALLATION

- A. Install or permanently fasten labels on each major item of mechanical equipment.
- B. Locate equipment labels where accessible and visible.

3.04 PIPE LABEL INSTALLATION

- A. Piping: Painting of piping is specified in Section 09 series "Interior Painting." and "High-Performance Coatings."
- B. Pipe-Label Locations: Locate pipe labels where piping is exposed or above accessible ceilings in finished spaces; machine rooms; accessible maintenance spaces such as shafts, tunnels, and plenums; and exterior exposed locations as follows:
 - 1. Near each valve and control device.
 - 2. Near each branch connection excluding short takeoffs. Where flow pattern is not obvious, mark each pipe at branch.
 - 3. Near penetrations and on both sides of through walls, floors, ceilings, and inaccessible enclosures.
 - 4. At access doors and similar access points that permit a view of concealed piping.
 - 5. Near major equipment items and other points of origination and termination.
 - 6. Spaced at maximum intervals of 25 feet along each run. Reduce intervals to 15 feet in areas of congested piping and equipment.
 - 7. On piping above removable acoustical ceilings. Omit intermediately spaced labels.
- C. Directional Flow Arrows: Arrows shall be used to indicate direction of flow in pipes including pipes where flow is allowed in both directions.

3.05 VALVE-TAG INSTALLATION

- A. Install tags on valves and control devices in fire-suppression piping systems. List tagged valves in a valve-tag schedule.
- B. Valve-Tag Application Schedule: Tag valves according to size, shape, and with captions similar to those indicated in "Valve-Tag Size and Shape" Subparagraph below:
 - 1. Valve-Tag Size and Shape:
 - a. Fire-Suppression Standpipe: 1-1/2 inches or 2 inches, round or square.
 - b. Wet-Pipe Sprinkler System: 1-1/2 inches or 2 inches, round or square.
 - c. Dry-Pipe Sprinkler System: 1-1/2 inches or 2 inches, round or square.

3.06 HYDRAULIC DESIGN INFORMATION SIGN

- A. Install a permanently marked weatherproof metal or rigid plastic sign secured with corrosion-resistant wire, chain, or other approved means at the system riser that includes the following information:
 - 1. Location of the design area or areas.
 - 2. Discharge densities over the design area or areas.
 - 3. Required flow and residual pressure demand at the base of the riser.
 - 4. Occupancy classification or commodity classification and maximum permitted storage height and configuration.
 - 5. Hose stream allowance included in addition to the sprinkler demand.
 - 6. The name of the installing contractor.

3.07 WARNING-TAG INSTALLATION

- A. Write required message on, and attach warning tags to equipment and other items where required.

END OF SECTION 21 05 53

SECTION 21 13 13 - WET-PIPE SPRINKLER SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

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

1.02 SUMMARY

- A. Section Includes:
 - 1. Pipes, fittings, and specialties.
 - 2. Specialty valves.
 - 3. Valves.
 - 4. Sprinklers.
 - 5. Alarm devices.
 - 6. Pressure gages.
 - 7. Backflow preventers.
 - 8. Fire department connections.
 - 9. Hangers and supports.
- B. Related Requirements:
 - 1. Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping"
 - 2. Section 210518 "Escutcheons for Fire-Suppression Piping"
 - 3. Section 210553 "Identification for Fire-Suppression Piping and Equipment"

1.03 DEFINITIONS

- A. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175-psig maximum.

1.04 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings and hydraulic calculations:
 - 1. Include plans, elevations, sections, and attachment details and hydraulic calculations in accordance with NFPA 13 "Plans and Calculations" Chapter. Hydraulic nodes shall be visibly shown on the drawings.
 - 2. Include diagrams for power, signal, and control wiring.
- C. Delegated-Design Submittal: For wet-pipe sprinkler systems indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer or NICET III or IV technician responsible for their preparation.

1.05 INFORMATIONAL SUBMITTALS

- A. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 - 1. Domestic water piping.
 - 2. Compressed air piping.
 - 3. HVAC hydronic piping.
 - 4. Items penetrating finished ceiling include the following:
 - a. Lighting fixtures.
 - b. Air outlets and inlets.
 - c. Fire alarm devices.
 - d. Security/communications devices.
- B. Qualification Data:
 - 1. Qualified Installer
 - 2. Professional engineer or NICET III or IV technician responsible for the preparation of shop drawings, hydraulic calculations, and product data submittal package.
- C. Design Data:
 - 1. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations.
- D. Welding certificates.
- E. Field Test Reports:
 - 1. Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
 - 2. Fire-hydrant flow test report.
- F. Field quality-control reports.

1.06 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For wet-pipe sprinkler systems and specialties to include in emergency, operation, and maintenance manuals.

1.07 MAINTENANCE MATERIAL SUBMITTALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench.. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project. The stock of spare sprinklers shall include all types and ratings installed and shall be as follows:
 - a. Protected facilities having under 300 sprinklers – no fewer than six sprinklers.
 - b. Protected facilities having 300 to 1000 sprinklers – no fewer than 12 sprinklers.
 - c. Protected facilities having over 1000 sprinklers – no fewer than 24 sprinklers.

1.08 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test not less than one year old from the date of shop drawing submittal.
 - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified NICET III or IV technician or professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to 2010 ASME Boiler and Pressure Vessel Code.
- C. All fire protection materials and equipment shall be UL listed and/or FM approved. Valve components (including valve trim, internal parts, gaskets, etc.) and other components as permitted by NFPA 13 shall not be required to be individually listed.
- D. Piping materials shall bear label, stamps, or other markings of specified testing agency.

1.09 DELIVERY, STORAGE, AND HANDLING

- A. Preparation for Transport: Prepare valves and piping according to the following:
 - 1. Ensure that valves and piping are dry and internally protected against rust and corrosion.
 - 2. Protect valves against damage to threaded ends and flange faces.
 - 3. Set valves in best position for handling. Set valves closed to prevent rattling.
- B. During Storage: Use precautions for valves according to the following:
 - 1. Do not remove end protectors unless necessary for inspection; then reinstall for storage.
 - 2. Protect from weather, humidity, temperature, dust, dirt, and water damage. Store indoors and maintain temperature higher than ambient dew point temperature. Support off the ground or pavement in watertight enclosures when outdoor storage is necessary.
- C. Deliver piping with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe-end damage and to prevent entrance of dirt, debris, and moisture.
- D. Protect stored piping from moisture and dirt. Elevate above grade. Do not exceed structural capacity of floor when storing inside.
- E. Protect flanges, fittings, and specialties from moisture and dirt.
- F. Store plastic piping protected from direct sunlight. Support to prevent sagging and bending.

PART 2 - PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

- A. Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:
 - 1. NFPA 13.
- B. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- C. Delegated Design: Engage a qualified professional engineer or NICET III or IV technician, as defined in Section 014000 "Quality Requirements," to design wet-pipe sprinkler systems.

1. Refer to fire protection drawings for fire-hydrant flow test records.
2. Sprinkler system design shall be approved by authorities having jurisdiction.
 - a. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
 - b. Sprinkler Occupancy Hazard Classifications:
 - 1) Light Hazard Occupancy: Offices, lobbies, conference rooms, classrooms, restrooms, sleeping rooms, and similar spaces.
 - 2) Ordinary Hazard Group 1 Occupancy: Electrical, telecom, mechanical, parking garage, general storage rooms, kitchens, laundry rooms, and similar spaces.
 - 3) Ordinary Hazard Group 2 Occupancy: Retail spaces, trash compactor room, loading docks, and similar spaces.
3. Minimum Density for Automatic-Sprinkler Piping Design:
 - a. Light-Hazard Occupancy: 0.10 gpm over 1500-sq. ft. area.
 - b. Ordinary-Hazard, Group 1 Occupancy: 0.15 gpm over 1500-sq. ft. area.
 - c. Ordinary-Hazard, Group 2 Occupancy: 0.20 gpm over 1500-sq. ft. area.
4. Hose stream requirement:
 - a. Light Hazard Occupancy: 100 gpm.
Ordinary Hazard Occupancy: 250 gpm.
5. Maximum Protection Area per Sprinkler: According to UL listing and below.
 - a. Light Hazard Occupancy: 225 sq. ft..
 - b. Ordinary Hazard Group 1 and 2 Occupancy: 130 sq. ft..
6. The design area is permitted to be reduced for use of quick-response sprinklers in accordance with NFPA 13.

2.02 STEEL PIPE AND FITTINGS

- A. Standard-Weight, Galvanized- and Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.
- B. Schedule 10, Black-Steel Pipe: ASTM A 135/A 135M or ASTM A 795/A 795M, Schedule 10 in NPS 2.5 and larger.
- C. Galvanized- and Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.
- D. Galvanized- and Uncoated-Steel Couplings: ASTM A 865/A 865M, threaded.
- E. Galvanized and Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.
- F. Malleable- or Ductile-Iron Unions: UL 860.
- G. Cast-Iron Flanges: ASME 16.1, Class 125.
- H. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
 1. Pipe-Flange Gasket Materials: AWWA C110, rubber, flat face, 1/8 inch thick or EPDM rubber gasket.
 - a. Class 125 and Class 250, Cast-Iron, Flat-Face Flanges: Full-face gaskets.

- b. Class 150 and Class 300, Ductile-Iron or -Steel, Raised-Face Flanges: Ring-type gaskets.
 - 2. Metal, Pipe-Flange Bolts and Nuts: Carbon steel unless otherwise indicated.
- I. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
 - 1. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.
- J. Grooved-Joint, Steel-Pipe Appurtenances:
 - 1. Pressure Rating: 175-psig minimum.
 - 2. Galvanized, Painted, Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting, with dimensions matching steel pipe.
 - 3. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213 rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.

2.03 CPVC PIPE AND FITTINGS

- A. CPVC Pipe: ASTM F 442/F 442M and UL 1821, SDR 13.5, for 175-psig rated pressure at 150 deg F, with plain ends. Include "LISTED" and "CPVC SPRINKLER PIPE" markings.
- B. CPVC Fittings: UL listed or FM Global approved, for 175-psig rated pressure at 150 deg F, socket type. Include "LISTED" and "CPVC SPRINKLER FITTING" markings.
 - 1. NPS 3/4 to NPS 1-1/2: ASTM F 438 and UL 1821, Schedule 40, socket type.
 - 2. NPS 2 to NPS 3: ASTM F 439 and UL 1821, Schedule 80, socket type.
 - 3. CPVC-to-Metal Transition Fittings: CPVC, one piece, with dimensions equivalent to pipe; one end with threaded brass insert, and one socket end.
 - 4. CPVC-to-Metal Transition Unions: CPVC, with dimensions equivalent to pipe; one end with threaded brass insert, and one socket end.
 - 5. Flanges: CPVC, one or two pieces.
- C. Solvent Cements for Joining CPVC Piping and Tubing: ASTM F 493 solvent cement recommended by pipe and fitting manufacturer and made for joining CPVC sprinkler pipe and fittings. Include cleaner or primer recommended by pipe and fitting manufacturer.
- D. Plastic Pipe-Flange Gasket and Bolts and Nuts: Type and material recommended by piping system manufacturer unless otherwise indicated.

2.04 VALVES

- A. Two-piece ball valves with indicators
 - 1. Standard: UL 1091, except with ball instead of disc and FM Global standard for indicating valves (butterfly or ball type), Class Number 1112.
 - 2. Pressure Rating: 175 psig minimum.
 - 3. Body Design: Two piece.
 - 4. Body Material: Forged brass or bronze.
 - 5. Port Size: Full or standard.
 - 6. Seats: PTFE.

7. Stem: Bronze or stainless steel.
 8. Ball: Chrome-plated brass.
 9. Actuator: Worm gear or traveling nut.
 10. End Connections: Threaded ends.
- B. Globe valves
1. Pressure Rating: 175 psig minimum.
 2. Body Material: Bronze with integral seat and screw-in bonnet.
 3. Stem: Bronze.
 4. Disc Holder and Nut: Bronze.
 5. Disc Seat: Nitrile.
 6. Packing: Asbestos free.
 7. Handwheel: Malleable iron, bronze, or aluminum.
 8. End Connections: Threaded ends.
- C. Butterfly valves with indicators
1. Standard: UL 1091 and FM Global standard for indicating valves, Class Number 1112.
 2. Pressure Rating: 175 psig minimum.
 3. Body Material: Bronze for NPS 1 through 2-1/2. Cast or ductile iron for NPS 2-1/2 and larger.
 4. Seat Material: EPDM.
 5. Stem Material: Bronze for NPS 1 through 2-1/2. Stainless steel for NPS 2-1/2 and larger.
 6. Disc: Bronze for NPS 1 through 2-1/2. Ductile iron for NPS 2-1/2 and larger.
 7. Actuator: Worm gear or traveling nut.
 8. Supervisory Switch: Internal or external.
 9. Body Design: Threaded ends for NPS 1 through NPS 2. Grooved ends for NPS 2-1/2 and larger.
- D. Check valves
1. Standard: UL 262 and FM Global standard for swing check valves, Class Number 1210.
 2. Pressure Rating: 175 psig minimum.
 3. Type: Single swing check.
 4. Body Material: Cast iron, ductile iron, or bronze.
 5. Clapper: Bronze, ductile iron, or stainless steel.
 6. Hinge Shaft: Bronze or stainless steel.
 7. Hinge Spring: Stainless steel.
 8. End Connections: Flanged, grooved, or threaded.
- E. OS&Y Gate Valves
1. Standard: UL 262 and FM Global standard for fire-service water control valves (OS&Y gate valves).
 2. Pressure Rating: 175 psig minimum.
 3. Body and Bonnet Material: Cast or ductile iron.
 4. Wedge: Cast or ductile iron.

5. Wedge Seat: Cast or ductile iron.
6. Stem: Brass or bronze.
7. Packing: Non-asbestos PTFE.
8. Supervisory Switch: External.
9. End connections: Flanged or grooved.

2.05 SPECIALTY VALVES

- A. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- B. Pressure Rating:
 1. Standard-Pressure Piping Specialty Valves: 175-psig minimum.
- C. Body Material: Cast or ductile iron.
- D. Size: Same as connected piping.
- E. End Connections: Flanged or grooved.
- F. Riser Check Valve Assembly:
 1. Standard: UL listed HMER
 2. Design: For horizontal or vertical installation.
 3. Include trim sets for drain and pressure gages.
- G. Automatic (Ball Drip) Drain Valves:
 1. Standard: UL 1726.
 2. Pressure Rating: 175-psig minimum.
 3. Type: Automatic draining, ball check.
 4. Size: NPS 3/4.
 5. End Connections: Threaded.
- H. Pressure Relief Valve:
 1. Standard: UL listed or FM approved for use in fire protection systems.
 2. Pressure Rating: 175-psig minimum.
 3. Size: NPS 1/2 minimum.
- I. Automatic air venting valve:
 1. Standard: UL 2573
 2. Pressure rating: 175-psig minimum.
 3. Body Material: Brass construction
 4. Size: NPS 1/2 minimum.
 5. End Connections: Threaded.

2.06 SPRINKLER PIPING SPECIALTIES

- A. Branch Outlet Fittings:
 1. Standard: UL 213.
 2. Pressure Rating: 175-psig minimum.
 3. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.

4. Type: Mechanical-tee and -cross fittings.
 5. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
 6. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
 7. Branch Outlets: Grooved, plain-end pipe, or threaded.
- B. Sprinkler Inspector's Test Fittings:
1. Standard: UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
 2. Pressure Rating: 175-psig minimum.
 3. Body Material: Cast- or ductile-iron housing with sight glass.
 4. Size: Same as connected piping.
 5. Inlet and Outlet: Threaded.
- C. Adjustable Drop Nipples:
1. Standard: UL 1474.
 2. Pressure Rating: 250-psig minimum.
 3. Body Material: Steel pipe with EPDM-rubber O-ring seals.
 4. Size: Same as connected piping.
 5. Length: Adjustable.
 6. Inlet and Outlet: Threaded.
- D. Flexible Sprinkler Hose Fittings:
1. Standard: UL 1474.
 2. Type: Flexible hose for connection to sprinkler, and with bracket for connection to ceiling grid.
 3. Pressure Rating: 175-psig minimum.
 4. Size: Same as connected piping, for sprinkler.

2.07 SPRINKLERS

- A. Listed in UL's "Fire Protection Equipment Directory" or FM Global's "Approval Guide."
- B. Pressure Rating for Residential Sprinklers: 175-psig maximum.
- C. Pressure Rating for Automatic Sprinklers: 175-psig minimum.
- D. Automatic Sprinklers with Heat-Responsive Element:
 1. Nonresidential Applications: UL 199.
 2. Residential Applications: UL 1626.
 3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.
 4. Nominal Orifice: 1/2 inch, with discharge coefficient K up to 5.8.
 5. Nominal Orifice: 1/2 inch or 3/4 inch with discharge coefficient K between 7.4 and 11.2.
- E. Sprinkler Finishes: Chrome plated, bronze, and painted. Refer to sprinkler schedule.
- F. Special Coatings: corrosion-resistant paint. Refer to sprinkler schedule.

- G. Sprinkler Escutcheons: Materials, types, and finishes for the following sprinkler mounting applications. Escutcheons for concealed, flush, and recessed-type sprinklers are specified with sprinklers.
 - 1. Ceiling Mounting: Chrome-plated steel, one piece, flat or Plastic, white finish, one piece, flat.
 - 2. Sidewall Mounting: Chrome-plated steel or Plastic, white finish, one piece, flat.
- H. Sprinkler Guards:
 - 1. Standard: UL 199.
 - 2. Type: Wire cage with fastening device for attaching to sprinkler.

2.08 HANGERS AND SUPPORTS

- A. Hangers and supports for fire suppression piping shall be UL listed or FM approved and installed in accordance with NFPA 13.
- B. Components of hanger assemblies that directly attach to the pipe or to the building structure shall be listed unless the following requirements are met:
 - 1. Mild steel hanger rods and hangers formed from mild steel rods shall be permitted to be not listed.
 - 2. Fasteners in concrete, steel, or wood in accordance with NFPA 13.
- C. Use carbon-steel pipe hangers and supports for general service applications.
- D. Use stainless-steel pipe hangers and supports or corrosion-resistant attachments for areas subject to corrosion including, but not limited to, dishwasher areas, shower rooms, pools, spa, and similar spaces.

2.09 AIR VENT FOR WET AND DRY SPRINKLERS

PIPE AND FITTINGS. Pipe and fittings for connection of air vent device to sprinkler piping.

- A. Pipe - Schedule 40 Steel, per ASTM A53 / A53M - Specification for Pipe, Steel, Black, Welded and Seamless.
- B. Nipples - Steel Pipe Nipples, Threaded End, per ASTM A733 - Specification for Welded and Seamless Carbon Steel Pipe Nipples.
- C. Fittings - All fittings shall be black. Galvanized fittings shall not be used. Fittings per ANSI B16.3 - Malleable Iron Threaded Fittings, or ANSI B16.4 - Cast Iron Threaded Fittings.
- D. Couplings - Per ASTM A865 - Specification for Threaded Couplings, Steel, Black, Welded or Seamless, for Use in Steel Pipe Joints.
- E. Unions. Use unions only as necessary where joining pipe is impossible or impractical without them. Unions per ANSI B16.39 - Malleable Iron Threaded Pipe Unions.
- F. Threads - Threaded ends per ANSI B2.1 - Basic Standards for Steel Pipe Threads, and ANSI B1.20.1 - Pipe Threads, General Purpose (Inch). All threads shall be NPT.

PART 3 - EXECUTION

3.01 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results provided on fire protection design drawings. Contractor shall conduct a new flow test if the date of the flow test provided on fire protection design drawings exceed 12 months from the date of working plan submittal.
- B. Report test results promptly and in writing.

3.02 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated on approved working plans.
 - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
 - 2. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.
- B. Piping Standard: Comply with NFPA 13 requirements for installation of sprinkler piping.
- C. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- D. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- E. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- F. Install "Inspector's Test Connections" in sprinkler system piping, complete with shutoff valve, and sized and located according to NFPA 13.
- G. Install sprinkler piping with drains for complete system drainage. Where low points cannot be avoided, auxiliary drains shall be provided in accordance with NFPA 13.
- H. Install sprinkler control valves, test assemblies, and drain risers adjacent to standpipes when sprinkler piping is connected to standpipes.
- I. Install automatic (ball drip) drain valve at low point in the fire-department connection piping system, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- J. Install alarm devices in piping systems.
- K. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13. In seismic-rated areas, seismic bracing shall be provided in accordance with NFPA 13.
- L. Install pressure gages on riser or feed main and at each sprinkler test connection. Include pressure gages with connection not less than NPS 1/4 and with soft-metal seated globe valve, arranged for draining pipe between gage and valve. Install gages to permit removal, and install where they are not subject to freezing.
- M. Fill sprinkler system piping with water.
- N. Install electric heating cables and pipe insulation on sprinkler piping in areas subject to freezing. Comply with requirements for heating cables in Section 210533 "Heat Tracing for Fire-

Suppression Piping" and for piping insulation in Section 210700 "Fire-Suppression Systems Insulation."

- O. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- P. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Section 210517 "Sleeves and Sleeve Seals for Fire-Suppression Piping."
- Q. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 210518 "Escutcheons for Fire-Suppression Piping."

3.03 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.
- F. Flanged Joints: Select appropriate gasket material in size, type, and thickness suitable for water service. Join flanges with gasket and bolts according to ASME B31.9.
- G. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
 - 1. Apply appropriate tape or thread compound to external pipe threads.
 - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- H. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.
- I. Dissimilar-Material Piping Joints: Make joints using adapters compatible with materials of both piping systems.
- J. Plastic-Piping, Solvent-Cement Joints: Clean and dry joining surfaces. Join pipe and fittings according to the following:
 - 1. Comply with ASTM F 402 for safe-handling practice of cleaners, primers, and solvent cements. Apply primer.
 - 2. CPVC Piping: Join according to ASTM D 2846/D 2846M Appendix.

3.04 BACKFLOW PREVENTER INSTALLATION

- A. Install backflow preventer of type, size and capacity indicated on the drawings. Include valves and test cocks. Install according to requirements of plumbing and health department and authorities having jurisdiction.

- B. Do not install backflow preventers that have relief drain in vault or in other spaces subject to flooding.
- C. Do not install bypass piping around backflow preventers.
- D. Support NPS 2-1/2 and larger backflow preventers and piping on concrete piers. Comply with requirements for concrete piers in Section 033000 "Cast-in-Place Concrete."

3.05 VALVE AND SPECIALTIES INSTALLATION

- A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.
- B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.
- C. Examine threads on valve and mating pipe for form and cleanliness.
- D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.
- E. Do not attempt to repair defective valves; replace with new valves.
- F. Install listed fire-protection valves, trim and drain valves, specialty valves and trim, controls, and specialties according to NFPA 13 and authorities having jurisdiction.
- G. Install listed fire-protection shutoff valves supervised open, located to control sources of water supply except from fire-department connections. Install permanent identification signs indicating portion of system controlled by each valve.
- H. Install backflow preventers instead of check valves in potable-water-supply sources.
- I. Specialty Valves:
 - 1. Install valves in vertical position for proper direction of flow, in main supply to system.
 - 2. Install riser check valves with drain outlet and pressure gage trim assembly.
 - 3. Install NPS 1/2 minimum pressure relief valve at the riser or at floor control valve assemblies downstream of check valves.
 - 4. Install automatic NPS 1/2 minimum automatic air vent valve at a high point in the sprinkler system to allow air to be removed from that portion of the system.

3.06 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of narrow dimension of acoustical ceiling panels.
- B. Install dry-type sprinklers with water supply from heated space. Do not install pendent or sidewall, wet-type sprinklers in areas subject to freezing.
- C. Install sprinklers into flexible, sprinkler hose fittings, and install hose into bracket on ceiling grid.

3.07 IDENTIFICATION

- A. Install labeling and pipe markers on equipment and piping according to requirements in NFPA 13.
- B. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in Section 260553 "Identification for Electrical Systems."

3.08 FIELD QUALITY CONTROL

- A. Perform the following tests and inspections:
 - 1. Hydrostatic test: After installation, all piping and attached appurtenances subjected to system working pressure shall be hydrostatically tested at 200 psi and shall maintain that pressure without loss for 2 hours. Repair leaks and retest until no leaks exist.
 - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
 - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
 - 4. Main drain valve test shall be performed, and the resulting static and residual pressure recorded in accordance with NFPA 13.
 - 5. All control valves shall be fully closed and opened under system working pressure to ensure proper operation.
 - 6. Energize circuits to electrical equipment and devices.
 - 7. Coordinate with fire-alarm tests. Operate as required.
 - 8. Coordinate with fire-pump tests. Operate as required.
 - 9. Verify that equipment hose threads are same as local fire department equipment.
 - 10. Backflow prevention assembly shall be forward flow tested at sprinkler system demand including hose stream allowance where applicable to ensure proper operation.
- B. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- C. Prepare test and inspection reports.

3.09 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Only sprinklers with their original factory finish are acceptable. Remove and replace any sprinklers that are painted or have any other finish than their original factory finish.

3.10 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain installed sprinkler system.

3.11 PIPING SCHEDULE

- A. Piping between Fire Department Connections and Check Valves: Galvanized, standard-weight steel pipe with grooved ends, grooved-end fittings, grooved-end-pipe couplings, and grooved joints.
- B. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- C. CPVC pipe, Schedule 40 and Schedule 80 CPVC fittings, and solvent-cemented joints may be used for light-hazard and residential occupancies.
- D. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be one of the following:
 - 1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
 - 2. Standard-weight, galvanized-steel pipe with threaded ends; galvanized, gray-iron threaded fittings; and threaded joints.

3. Standard-weight, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 4. Standard-weight, galvanized-steel pipe with roll-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 5. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- E. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 and larger, shall be one of the following:
1. Standard-weight, black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 2. Standard-weight, galvanized-steel pipe with roll-grooved ends; galvanized, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 3. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
 4. Schedule 10 black-steel pipe with roll-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
 5. Schedule 10 black-steel pipe with plain ends; welding fittings; and welded joints.

3.12 SPRINKLER SCHEDULE

- A. Use sprinkler types in subparagraphs below for the following applications:
1. Rooms without Ceilings: Upright sprinklers.
 2. Rooms with Suspended Ceilings: Recessed sprinklers, Concealed sprinklers.
 3. Wall Mounting: Sidewall sprinklers.
 4. Spaces Subject to Freezing: Pendent, dry sprinklers, Sidewall, dry sprinklers.
 5. Special Applications: Extended-coverage where indicated, Attic sprinklers, Combustible concealed space sprinklers.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
1. Concealed Sprinklers: Rough brass, with factory-painted white cover plate.
 2. Recessed Sprinklers: Bright chrome, with bright chrome escutcheon.
 3. Residential Sprinklers: Dull chrome.
 4. Upright Pendent and Sidewall Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view.
 5. Sprinklers in areas subject to moisture/condensation shall be provided with corrosion resistant finish. This includes, but is not limited to, shower rooms, dishwashing areas, and similar spaces.

END OF SECTION 21 13 13

SECTION 23 05 00 - COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SYSTEM DESCRIPTION

- A. Design Requirements: Contract drawings are generally diagrammatic and do not indicate all offsets, fittings, transitions, access panels and other specialties required.
 - 1. Furnish and install all items as may be required at no additional cost to fit the work to the conditions encountered.
 - 2. Arrange piping, ductwork, equipment and other work generally as shown on the contract drawings, providing proper clearances and access.
 - 3. Where departures are proposed because of field conditions or other causes, prepare and submit detailed shop drawing submittal for approval in accordance with Submittals specified below.
 - 4. Subject to the provisions of Division 01, Architect may make reasonable changes in location of equipment piping and ductwork up to the time of rough-in or fabrication.

1.2 SUBMITTALS

- A. Shop Drawings and Product Data:
 - 1. Clearly identify all submittals:
 - a. Indicate intended application, location, etc.
 - b. Each submittal shall indicate the associated specification section, and paragraphs. Do not combine product data and shop drawing submittals from different spec sections into a single submittal package, even though they may be the same distributor, vendor or part of a single material order.
 - c. Clearly indicate the exact type, model number, size and special features of the proposed item.
 - d. Include catalog spec sheets to completely describe proposed equipment.
 - e. Factory order forms only showing the required capacities are not acceptable.
 - f. Identify all options furnished to meet specifications.
 - g. The Architect shall not select equipment ratings and/or options. Submittals not properly marked shall be returned without review.
- B. Product Substitutions: Comply with requirements of Division 01.
- C. Comparable Products Submission:
 - 1. Document each request for a proposed comparable product with supporting data substantiating compliance of proposed product with Basis-of-Design product.

1.3 QUALITY ASSURANCE

- A. Underwriter's Laboratory (UL) Requirements: All equipment containing electrical components and provided under Division 23 shall bear the Underwriter's Laboratory (UL)

label, as a complete packaged system.

- B. Fire Safe Materials: Unless otherwise indicated, materials shall conform to UL, National Fire Protection Agency (NFPA) or American Society for Testing and Materials (ASTM) standards for fire safety with smoke and fire hazard rating not exceeding flame spread of 25 and smoke developed of 50.

1.4 PROJECT CONDITIONS

- A. Existing Conditions: Prior to preparing the bid, visit the site and become familiar with all existing conditions. Make all necessary investigations as to locations of utilities and all other matters, which can affect the work. No additional compensation will be made for failure to determine the conditions under which the work will be performed.
- B. Outages
 - 1. All mechanical outages which will interfere with the normal use of the building in any manner shall be done at such times as shall be mutually agreed upon with the Owner.
 - 2. Unless otherwise specified, outages of any services required for the performance of this contract and affecting areas other than the immediate work area shall be scheduled with the Owner at least fourteen days (14) days in advance. All such outages shall be performed as directed by the owner.
 - 3. The bid price shall include the cost of all premium time required for outages and other work which interferes with the normal use of the building.
 - 4. The operation of valves or switches required to achieve an outage shall be accomplished by the Owner. Unauthorized operation of valves, power switches, or other control devices shall not be permitted.

1.5 DISCREPANCIES

- A. Where discrepancies occur between the drawings and specifications or within either document itself, the item or arrangement of better quality, greater quantity or higher cost shall be included in the contract price. The Architect shall decide on the item and manner in which the work shall be provided, based on the design intent of the documents.

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION

- A. General Product Requirements: Provide products that comply with Contract Documents that are undamaged and new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, safety guards, and other devices and details needed for complete installation and intended use and effect.
 - 2. Standard Products: Where available, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Where products are accompanied by the term as selected, Architect will make selection.
 - 4. Where products are accompanied by the term match sample, sample to be matched is Architect's.
 - 5. Descriptive, performance, and reference standard requirements in the

Specifications establish salient characteristics of products.

- B. General Compliance Requirements: Compliance requirements for individual products, as indicated in Contract Documents, are multiple in nature and may include generic descriptions, performance requirements, compliance with reference standards, conformance with graphic details and other similar forms and methods of indicating requirements, all of which must be complied with.
- C. Procedures for Selecting Products: Contractor's options for selecting products are limited by Contract Document requirements, and are not controlled by industry traditions or procedures experienced by Contractor on previous construction projects.
- D. Products specified by Reference Standards, Codes and Regulations: Select from among products, which can be shown to comply with referenced documents.
- E. Products specified by Naming Products and Manufacturers: Select from among products listed.
- F. Products specified by Naming One Manufacturer's Product as the Basis-of-Design with Reference to Other Manufacturers: Select either the specified Basis-of-Design product or an approved comparable product by one of the other named manufacturers.
 - 1. Comply with provisions in Comparable Products Article to obtain approval for use of a comparable product by one of the named manufacturers.
- G. Products specified by Naming One Manufacturer's Product and Indicating Option of Selecting Comparable Products by stating or Approved Equivalent or similar language: Select either the specified product or an approved comparable product.
 - 1. Comply with provisions in Comparable Products Article to obtain approval for use of a comparable product by one of the named or un-named manufacturers.
- H. Visual Matching Specification: Where Specifications require matching an established Sample, select a product that complies with requirements and, matches Architect's sample. Architect's decision will be final on whether proposed product matches satisfactorily.
- I. Visual Selection Specification: Where Specifications include the phrase as selected from manufacturer's standard colors, patterns, textures or similar phrase, select a product that complies with other specified requirements. Architect will select color, pattern, and texture.
 - 1. Standard Range: Where Specifications include the phrase standard range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that does not include premium items.
 - 2. Full Range: Where Specifications include the phrase full range of colors, patterns, textures or similar phrase, Architect will select color, pattern, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Where Basis-of-Design products are specified by name, submit the following, in addition to other required submittals, to obtain approval of a comparable product by one of the

named manufacturers:

1. Evidence that the proposed product does not require extensive revisions to the Contract Documents that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work.
2. Detailed comparison of significant qualities of proposed product with the Basis-of-Design product in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, serviceability, visual effect, and specific features and requirements indicated.
3. Evidence that proposed product provides specified warranty.
4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
5. Samples, if requested.

2.3 ACCESS DOORS AND PANELS

- A. Provide manufactured steel door assemblies consisting of:
 1. Hinged door.
 2. Flush screwdriver camlocks and frame.
- B. Doors shall be Milcor Metal Access doors. Provide key locks where indicated.
- C. Design shall be provided for the following installations:
 1. Masonry or Dry Wall: Style M.
 2. Hard Finish Plaster: Style AP.
 3. Fire rated dry wall ceilings: Style CFRAD, 1 hour combustible floor ceiling system, 1 hour non-combustible floor ceiling system, 3 hour non-combustible floor ceiling system.
 4. Suspended ceilings: Style CT.
 5. Security: Style 3211.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. General: Sequence, coordinate, and integrate the various elements of mechanical systems, materials, and equipment. Comply with the following requirements:
 1. Coordinate mechanical systems, equipment, and materials installation with other building components.
 2. Verify all dimensions by field measurements.
 3. Arrange for chases, slots, and openings in other building components during progress of construction, to allow for mechanical installations.
 4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
 5. Sequence, coordinate, and integrate installations of mechanical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
 6. Where systems, materials and equipment are intended for overhead installation,

- and where mounting heights are not detailed or dimensioned, install systems, materials, and equipment to provide the maximum headroom possible.
7. Install systems, materials, and equipment to conform with approved submittal data, including coordination drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are shown only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
 8. Install systems, materials, and equipment level and plumb, parallel and perpendicular to other building systems and components.
 9. Install mechanical equipment to facilitate servicing, maintenance, and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
 10. Install access panel or doors where units are concealed behind finished surfaces.
 11. Install systems, materials, and equipment giving right-of-way priority to systems required to be installed at a specified slope.

3.2 CUTTING AND PATCHING

- A. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.
- B. Perform cutting, fitting, and patching of mechanical equipment and materials required to:
 1. Uncover Work to provide for installation of ill-timed Work.
 2. Remove and replace defective Work.
 3. Remove and replace Work not conforming to requirements of the Contract Documents.
 4. Remove samples of installed Work as specified for testing.
 5. Install equipment and materials in existing structures.
 6. Upon written instructions from the Architect, uncover and restore Work to provide for Architect observation of concealed Work.
- C. Cut, remove and legally dispose of selected mechanical equipment, components, and materials as indicated, including but not limited to removal of mechanical piping, heating units, ductwork, plumbing fixtures and trim, and other mechanical items made obsolete by the new Work.
- D. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed.
- E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.
- F. Patch finished surfaces and building components using new materials specified for the original installation and using experienced Installers. Installers' qualifications refer to the materials and methods required for the surface and building components being patched.

3.3 MECHANICAL DEMOLITION

- A. Disconnect, demolish, and remove work specified under Division 23 and as indicated.

Remove pipes and ducts back to the active pipe and duct to remain and cap.

- B. Where pipe, ductwork, insulation, or equipment to remain is damaged or disturbed, remove damaged portions and install new products of equal capacity and quality.
- C. Accessible Work: Remove indicated exposed pipe and ductwork in its entirety.
- D. Abandoned Work: Cut and remove buried pipe abandoned in place, 2 inches beyond the face of adjacent construction. Cap and patch surface to match existing finish.
- E. Removal: Remove indicated equipment from the Project site.
- F. Temporary Disconnection: Remove, store, clean, reinstall, reconnect, and make operational equipment indicated for relocation.

3.4 CLEANING

- A. Clean surfaces prior to application of insulation, adhesives, coating, and paint.
- B. Provide factory applied finish where specified.
- C. Protect all finishes, and restore all finishes to their original condition if damaged as a result of work under Division 23.
- D. Remove all construction marking and writing from exposed equipment, ductwork, piping and building surfaces.
- E. General: General cleaning during construction is required by the General Conditions and included in Section Temporary Facilities.
- F. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, commercial building cleaning and maintenance program. Comply with manufacturer's instructions.
- G. Remove all mechanical clipping, wiring, nuts, bolts, etc. left on top of ceilings and ceiling tiles.

3.5 PROTECTION

- A. Protect work, material and equipment from weather and construction operations before and after installation.
- B. Properly store and handle all materials and equipment.
- C. Cover temporary openings in piping, ductwork and equipment to prevent the entrance of water, dirt, debris, and other foreign matter.

3.6 ELECTRICAL WORK

- A. It is the intent to provide a complete and operational system. The work between Division 23 and 26 is complementary and is meant to produce a single and operating system. Contractor shall make its own determination as to the distribution of responsibility among

the various trades.

- B. All electrical work performed under Division 23 shall be provided in accordance with Division 26.

3.7 PROVISIONS FOR ACCESS

- A. Furnish and install adequate access to all HVAC and plumbing components. The following list shall be used as a guide only:
 - 1. Mechanical equipment.
 - 2. Valves.
 - 3. Dampers and operators.
 - 4. Filters.
 - 5. Heating and air conditioning units.
- B. Access shall be adequate as determined by the Architect.
- C. Refer to contract drawings where panels have been specifically located.
- D. Provide additional panels for adequate access as indicated in paragraph A above.
- E. Where access is by means of liftout ceiling tiles or panels mark each panel using small color-coded or numbered tabs. Provide an index chart for identification. Place markers in corner of tile.

3.8 PROJECT PUNCH OUT

- A. Architect/Engineer will perform punch out reviews and will provide the Contractor with a list of punch list items to be completed before contract close out. Each and every punch list item shall be initialed and dated by the Contractor when the work is complete. The Architect/ Engineer will not perform any punch list verification until all items have been completed, initialed, dated and the list returned to the Architect/Engineer. If any items have been initialed as being completed by the Contractor and the Architect/Engineer determines that the work is not complete, the Architect/Engineer shall be reimbursed by the Contractor at his regular hourly rate for any and all items requiring revisiting of the site by the Architect/Engineer. Reimbursement will be made by deducting the Architect/Engineer fee from the Contractor's final payment.

END OF SECTION

SECTION 23 05 29 - HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. General Requirements

1. Incorporate in construction pipe hangers and supports to manufacturer's recommendations utilizing manufacturer's regular product components, parts, and assemblies.
2. Comply with maximum load ratings with considering for allowable stresses prescribed by ASME B31.1 or MS SP-58.
3. Provide support, guides and anchors that do not transmit unacceptable heat and vibration to building structure.

1.2 SUBMITTALS

- A. Shop Drawings: Indicate system layout with location including critical dimensions, sizes, and pipe hanger and support locations and detail of trapeze hangers.
- B. Product Data:
 - 1. Hangers and Supports: Submit manufacturers catalog data including load capacity.
 - 2. Firestopping: Submit data on product characteristics, performance and limitation criteria.
- C. Firestopping Schedule: Submit schedule of opening locations and sizes, penetrating items, and required listed design numbers to seal openings to maintain fire resistance rating of adjacent assembly.
- D. Design Data: Indicate load carrying capacity of trapeze, multiple pipe, and riser support hangers. Indicate calculations used to determine load carrying capacity of trapeze, multiple pipe, and riser support hangers. Submit sizing methods sealed by a registered professional engineer.
- E. Manufacturer's Installation Instructions:
 - 1. Hangers and Supports: Submit special procedures and assembly of components.
 - 2. Firestopping: Submit preparation and installation instructions.
- F. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- G. Firestopping Engineering Judgments: For conditions not covered by UL or WH listed designs, submit judgments by licensed professional engineer suitable for presentation to authority having jurisdiction for acceptance as meeting code fire protection requirements.
- H. Welder certificates signed by Contractor certifying that welders comply with requirements specified under the "Quality Assurance" Article.

1.3 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this section with minimum five

years documented experience.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Structural Steel: ASTM A 36, "Carbon Structural Steel," steel plates, shapes, and bars, black and galvanized.
- B. Bolts and Nuts: ASME B18.10 or ASTM A 183, "Track Bolts and Nuts," steel, hex-head, track bolts and nuts.
- C. Washers: ASTM F 844, "Standard Specification for Washers, Steel, Plain (Flat), Unhardened for General Use," steel, plain, flat washers.
- D. Grout: ASTM C 1107, Grade B, "Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Non-shrink)," non-shrink, nonmetallic.
 - 1. Characteristics include post-hardening, volume-adjusting, dry, hydraulic-cement-type grout that is non-staining, noncorrosive, nongaseous and is recommended for both interior and exterior applications.
 - 2. Design Mix: 5000-psi, 28-day compressive strength.
 - 3. Water: Potable.
 - 4. Packaging: Premixed and factory-packaged.
- E. General: All materials, sealants, adhesives, etc. shall be low-VOC.

2.2 HANGERS AND SUPPORTS

- A. Hangers, Supports, and Components: Provide factory-fabricated products as manufactured by B-Line, Tyco – (Anvil Hangers), Pipe Shields, Inc., or Erico CADDY. Basis of Design shall be B-Line.
- B. Install rigid round, rectangular, and flat oval metal duct with support systems indicated in SMACNA "HVAC Duct Construction Standards," Tables 4-1 through 4-3 and Figures 4-1 through 4-8.
- C. Support horizontal ducts within 2 feet of each elbow and within 4 feet of each branch intersection.
- D. Upper attachments to structures shall have an allowable load not exceeding 3 of the failure (proof test) load but are not limited to the specific methods indicated.
- E. Beam Clamps and Attachments:
 - 1. For bolt-on locations to structure, Figure Nos. B3291, B3036, or B3050.
 - 2. Welded beam attachments, Figure No. B3083.
- F. Brackets:
 - 1. For equipment and piping adjacent to walls or steel columns, Figure Nos. B3066, B3063 and B3067 depending on weight to be supported.
- G. Hanger Rods:

1. Hanger rod, Figure No. B3205.
2. Continuous threaded rod, Figure No. ATR.
3. Eye rods, Figure No. B3210 or B3211, depending on load supported.

H. Trapeze Hangers - Direct Mounting Hangers:

1. Grinnell, Figure No. 46.

2.3 SLEEVES

- A. Sleeves for Round Ductwork: Galvanized steel.
- B. Sleeves for Rectangular Ductwork: Galvanized steel or wood.
- C. Sealant: Acrylic

2.4 FORMED STEEL CHANNEL

- A. Product Description: Galvanized 12 gage thick steel. With holes 1-1/2 inches on center.

2.5 FIRESTOPPING

- A. Product Description: Different types of products by multiple manufacturers are acceptable as required to meet specified system description and performance requirements; provide only one type for each similar application.
 1. Silicone Firestopping Elastomeric Firestopping: Single component silicone elastomeric compound and compatible silicone sealant.
 2. Foam Firestopping Compounds: Single component foam compound.
 3. Formulated Firestopping Compound of Incombustible Fibers: Formulated compound mixed with incombustible non-asbestos fibers.
 4. Fiber Stuffing and Sealant Firestopping: Composite of mineral or ceramic fiber stuffing insulation with silicone elastomer for smoke stopping.
 5. Mechanical Firestopping Device with Fillers: Mechanical device with incombustible fillers and silicone elastomer, covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
 6. Intumescent Firestopping: Intumescent putty compound which expands on exposure to surface heat gain.
 7. Firestop Pillows: Formed mineral fiber pillows.

2.6 FIRESTOPPING ACCESSORIES

- A. Primer: Type recommended by firestopping manufacturer for specific substrate surfaces and suitable for required fire ratings.
- B. Dam Material: Permanent:
 1. Mineral fiberboard.
 2. Mineral fiber matting.
 3. Sheet metal.
 4. Plywood or particle board.
 5. Alumina silicate fire board.
- C. Installation Accessories: Provide clips, collars, fasteners, temporary stops or dams, and

other devices required to position and retain materials in place.

- D. General:
 - 1. Furnish UL listed products or products tested by independent testing laboratory
 - 2. Select products with rating not less than rating of wall or floor being penetrated.
- E. Non-Rated Surfaces:
 - 1. Stamped steel, chrome plated, hinged, split ring escutcheons or floor plates or ceiling plates for covering openings in occupied areas where piping is exposed.
 - 2. For exterior wall openings below grade, furnish mechanical sealing device to continuously fill annular space between piping and cored opening or water-stop type wall sleeve.

2.7 ACOUSTICAL SEALANT

- A. Sealants for acoustical purposes shall be one of following non-setting sealants:

Acoustical sealant	D.A.P.
BR – 96	Pecra
Acoustical sealant	Tremco
Acoustical sealant	U.S.G.

PART 3 - EXECUTION

3.1 INSTALLATION - INSERTS

- A. Install inserts for placement in concrete forms.
- B. Install inserts for suspending hangers from reinforced concrete slabs and sides of reinforced concrete beams.
- C. Where concrete slabs form finished ceiling, locate inserts flush with slab surface.
- D. Where inserts are omitted, drill through concrete slab from below and provide through-bolt with recessed square steel plate and nut recessed into and grouted flush with slab.

3.2 INSTALLATION OF HANGERS AND SUPPORTS

- A. General: Comply with MSS SP-69 "Pipe Hangers, and Supports C Selection and Application", and SP-89, "Pipe Hangers and Supports - Fabrication and Installation Practices". Install hangers, supports, clamps, and attachments as required to properly support piping from building structure. Piping shall be supported independently from equipment connections. Supports shall not interfere with removal of equipment.
- B. Install supports with maximum spacings complying with MSS SP-69, "Pipe Hangers, and Supports C Selection and Application" and as specified in Division 23 Section: "Pipes and Tubes for HVAC Piping and Equipment."
- C. Install building attachments within concrete or to structural steel. Space attachments within maximum piping span length indicated in MSS SP-69, "Pipe Hangers, and Supports C Selection and Application". Install additional attachments at concentrated

loads, including valves, flanges, guides, strainers, expansion joints, and at changes in direction of piping. Install concrete inserts in new construction prior to placing concrete. Install reinforcing bars through openings at top of inserts.

- D. Install powder-actuated drive-pin fasteners in concrete after concrete is placed and completely cured. Use operators that are licensed by powder-actuated tool manufacturer. Install fasteners according to powder-actuated tool manufacturer's operating manual. Does not use in lightweight concrete slabs or in concrete slabs less than 4 inches (100 mm) thick.
- E. Install mechanical-anchor fasteners in concrete after concrete is placed and completely cured. Install according to fastener manufacturer's written instructions. Do not use in lightweight concrete slabs or in concrete slabs less than 4 inches (100 mm) thick.
- F. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.
- G. Heavy-Duty Steel Trapezes: Field-fabricate from ASTM A 36, "Carbon Structural Steel," 2001, steel shapes selected for loads being supported. Weld steel according to AWS D-1.1, "Structural Welding Code – Steel."
- H. Install hangers with minimum 1/2 inch space between finished covering and adjacent work.
- I. Place hangers within 12 inches of each horizontal elbow.
- J. Use hangers with 1-1/2 inch minimum vertical adjustment.
- K. Provide clearance in hangers and from structure and other equipment for installation of insulation.

END OF SECTION

SECTION 23 05 93 - TESTING, ADJUSTING AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

- A. Coordinate work of this section with all trades.
- B. Work covered in this Section shall be performed after completion of work specified in all Divisions as they related to this work.
- C. Review of design drawings and specifications, and comment on potential problem areas.
- D. Site inspections of ongoing plumbing installation with written report from each visit.
- E. Air leak testing of ductwork system. See Division 23 Section: "HVAC Air Distribution."
- F. Section Includes:
 - 1. Testing adjusting, and balancing of air systems.
 - 2. Measurement of final operating condition of HVAC systems.
 - 3. Sound measurement of equipment operating conditions.
- G. Coordinate with all trades to provide all incidental items not indicated on drawings or in specifications that belong to work described or are required for complete systems balancing, at no additional cost to Owner.

1.2 SUBMITTALS

- A. Agency Data:
 - 1. Submit proof that proposed testing, adjusting, and balancing agency meets the qualifications specified within 30 days of award of contract.
- B. Engineer and Technicians Data:
 - 1. Submit proof that Test and Balance Engineer assigned to supervise procedures, and technicians proposed to perform procedures meet qualifications specified within 30 days of award of contract.
- C. Procedures and Agenda: Submit synopsis of testing, adjusting, and balancing procedures and agenda proposed to be used for this project within 90 days of award of contract.
 - 1. Prior to commencing work, submit report forms or outlines indicating adjusting, balancing, and equipment data required. Include detailed procedures, agenda, sample report forms, and copy of AABC National Project Performance Guaranty, NEBB Certificate of Conformance Certification, or TABB International Quality Assurance program guarantee.
- D. Document Review:
 - 1. Submit certification in writing that all design drawings and specifications have

been reviewed, and comment on potential problems within 90 days of award of contract.

- E. Maintenance Data: Submit maintenance and operating data that include how to test, adjust, and balance the building systems. Include this information in maintenance data specified in Division 01 and Division 23 Section: "Common Work Results for HVAC."
- F. Certified Reports: Submit testing, adjusting, and balancing reports bearing the seal and signature of Test and Balance Engineer. Reports shall be certified proof that systems have been tested, adjusted, and balanced in accordance with referenced standards; are an accurate representation of how systems have been installed; are true representation of how systems are operating at completion of testing, adjusting, and balancing procedures; and are accurate record of final quantities measured, to establish normal operating values of the systems. Follow procedures and format specified below:
 - 1. Report Format: Report forms shall be those standard forms prepared by referenced standard for each respective item and system to be tested, adjusted, and balanced. Bind report forms complete with schematic systems diagrams and other data in reinforced, vinyl, three-ring binders. Provide binding edge labels with project identification and a title descriptive of contents. Divide contents of binder into divisions listed below, separated by divider tabs:
 - a. General Information and Summary
 - b. Air Systems
 - c. Automatic Temperature Controls
 - d. Special Systems
 - e. Sound and Vibration Systems
 - 2. Report Contents: Provide following minimum information, forms and data:
 - a. General Information and Summary: Inside cover sheet to identify testing, adjusting, and balancing agency, Contractor, Owner, Architect, Engineer, and Project. Include addresses, and contact names and telephone numbers. Include certification sheet containing seal and name address, telephone number, and signature of Certified Test and Balance Engineer. Include in this division listing of the instrumentations used for the procedures along with proof of calibration.
 - b. Remainder of the report shall contain appropriate forms containing as minimum, information indicated on standard report forms prepared by AABC and NEBB, for each respective item and system. Prepare schematic diagram for each item of equipment and system to accompany each respective report form.
- G. Field Reports: Indicate deficiencies preventing proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.
- H. NIST Calibration Reports: Submit proof that all testing and balancing instruments and equipment used for this project has been calibrated in accordance with NIST Standards, within period of twelve months prior to starting project.
 - 1. For pharmaceutical GMP facilities, certified cleanrooms, etc. calibration period shall be within six (6) months.
- I. Submit draft copies of report for review prior to final acceptance of Project.
- J. Furnish reports complete with table of contents page and indexing tabs, with cover

identification at front and side. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets, and indicating thermostat locations.

- K. Final submittal shall include but not be limited to following:
1. List of equipment used to perform test and procedures.
 2. Equipment performance data and equipment curves with actual points of performance indicated on curves as compiled during balancing.
 3. Air Devices including VAV Boxes (supply, return and exhaust) and all air outlets.
 4. Duct traverse readings during balancing.
 5. Room sound pressure levels.
 6. On balance report documents record date and time of reading.
 7. Field verification of fume hood face velocities based on SEFA test procedure.

1.3 QUALITY ASSURANCE

- A. Perform Work in accordance with Authority Having Jurisdiction requirements.
- B. Agency Qualifications:
1. Employ services of independent testing, adjusting, and balancing agency meeting qualifications specified below, to be single source of responsibility to test, adjust, and balance the building heating, ventilating and air conditioning systems to produce design objectives. Services shall include checking installations for conformity to design, measurement and establishment of fluid quantities of mechanical systems as required to meet design specifications, and recording and reporting results.
 2. Certified by National Environmental Balancing Bureau (NEBB) or by Associated Air Balance Council (AABC) in those testing and balancing disciplines required for this project, and having at least one Professional Engineer registered in State in which services are to be performed, certified by NEBB or AABC as Test and Balance Engineer.
- C. Work shall be accomplished in accordance with specifications. Procedures specified shall be followed and, if not specifically described herein, in general, shall be in accordance with Associated Air Balance Council's National Standards or National Environmental Balancing Bureau's Procedural Standards.
- D. Design Review:
1. Review all design drawings and specifications. Review shall include:
 - a. Duct pressure classification.
 - b. Control device location and balancing devices location in duct systems and piping systems.
 - c. Indicate additional balancing devices required for proper balancing.
 - d. Specifications on all devices required for balancing.
 - e. Note any potential noise problems.
 2. Within 90 days of award of contract, meet with the Architect, Mechanical Contractor, and Building Automation System Contractor to review procedures and agenda and comments on design documents as to potential problem areas.
- E. Shop Drawing Review:
1. Review "Instrumentation and Control for HVAC" shop drawing submittals noting

any potential balancing problems. Note comments on submittal, sign, stamp and return to General Contractor. All "Instrumentation and Control for HVAC" submittals must be reviewed by balancing agency prior to review by Architect.

- F. During construction, balancing agency shall inspect the installation of pipe systems, temperature controls, and other component parts of heating, ventilating, and air conditioning systems. Inspections shall be performed periodically as work progresses. Minimum of two inspections are required as follows: (1) when 60 percent of ductwork is installed; (2) when 90 percent of equipment is installed. Balancing agency shall submit brief written report of each inspection to Owner and Architect.

1.4 QUALIFICATIONS

- A. Agency: Company specializing in testing, adjusting, and balancing of systems specified in this section with minimum five years' experience certified by AABC, NEBB, or TABB.

PART 2 - PRODUCTS (NOT USED)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Preliminary Work:
1. Inspect project site prior to starting adjustments to verify completion of trades, including general construction, piping system, ductwork system, building automation systems, and electrical systems, as they relate to balancing work. Verify systems are complete and operable before commencing work. Verification shall include but not be limited to following:
 - a. Systems are started and operating in safe and normal condition.
 - b. Ductwork System:
 - 1) Duct joints sealed.
 - 2) Witness leakage tests required under sheet metal section.
 - 3) Dampers and control devices installed.
 - 4) Duct systems are clean of debris.
 - 5) Fire and volume dampers are in place and open.
 - c. Balancing devices are installed and accessible.
 - d. Control device connections.
 - 1) HVAC control systems are installed complete and operable.
 - e. Note problems in general construction of the building that might effect systems performance such as sealing of windows, building joints, exhaust shafts, etc.
 - f. Problems discovered during this inspection shall be reported to General Contractor and Owner.
 - g. Air outlets are installed and connected.

2. Contractor shall certify in writing that each piping system has been prepared as per this Section, indicating dates procedures were done and which contractor did work. Submit in writing to Architect before beginning balancing work.

3.2 INSTALLATION TOLERANCES

- A. Air Handling Systems: Adjust to within plus or minus 10 percent of design.
- B. Air Outlets and Inlets: Adjust total to within plus or minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 5 percent of design.

3.3 ADJUSTING

- A. Verify recorded data represents actual measured or observed conditions.
- B. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.
- C. After adjustment, take measurements to verify balance has not been disrupted. If disrupted, verify correcting adjustments have been made.
- D. Report defects and deficiencies noted during performance of services, preventing system balance.

3.4 SYSTEM BALANCE - GENERAL REQUIREMENTS

- A. Balance heating, ventilating, and air conditioning to obtain air and water quantities indicated and required for proper operation of system.
- B. Field work performed under this Section shall be provided under direct supervision of a Registered Professional Engineer.
- C. Furnish services for complete adjustment of water systems, steam systems and air handling and exhaust systems, water, steam and air distribution and controls.
- D. During all tests, it shall be demonstrated that systems shall be free from leaks and all parts of system will operate correctly. If not, report deficiencies to Contractor and Owner. Balancing Firm shall make final adjustments to equipment as may be required for proper operation, maintaining correct temperatures in all parts of the building. Controls shall be adjusted by "Instrumentation and Control for HVAC" technicians in conjunction with Balancing Firm. Coordinate setpoints and adjustments with "Instrumentation and Control for HVAC."
- E. Balancing of heating and air conditioning, special exhaust and ventilating systems to achieve air quantities specified at each air inlet, outlet, or damper shown on plans at proper conditions of static pressure and temperature differential.
- F. Study and report on excessive noise conditions, which may develop during system balancing. Report shall be sent to Architect.

3.5 CALIBRATION

- A. During testing and balancing, inspect temperature sensors, pressure sensors, digital indicators, and thermometers, etc. provided under Division 23. Report discrepancies to the Contractor for replacement or recalibration.

3.6 RE-BALANCE

- A. After Architect's review of test and balance report submittal, make adjustment in any balancing point as required by Architect, to correct discrepancies between balance report and design, at no additional cost.

3.7 FINAL BALANCE

- A. Visit site within one year after building occupancy if necessary to adjust and rebalance, any system required by Owner, to resolve any and all complaints. After final balance, revise previous submittal and resubmit to architect for record purpose. Rebalance and resubmittals shall be done at no additional cost to Owner.

END OF SECTION

SECTION 23 07 00 - HVAC INSULATION

PART 1 - GENERAL

1.1 SUBMITTALS

- A. Product Data: Submit product description, thermal characteristics and list of materials and thickness for each service, and location.
- B. Manufacturer's Installation Instructions: Submit manufacturers published literature indicating proper installation procedures.

1.2 QUALITY ASSURANCE

- A. Installer Qualifications: Skilled mechanics who have successfully completed an apprenticeship program or another craft training program certified by the Department of Labor, Bureau of Apprenticeship and Training.

1.3 QUALIFICATIONS

- A. Applicator: Company specializing in performing Work of this section with minimum three years' experience.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

- A. Refer to Part 3 execution schedule for requirements regarding where insulating materials shall be applied.
- B. Products shall not contain asbestos, lead, mercury or mercury compounds.
- C. Insulation products shall contain no formaldehyde-based binders or shall be third-party certified for conformance with GREENGUARD Gold or Indoor Advantage Gold. (GREENGUARD Children and Schools is now called GREENGUARD Gold)
- D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.
- E. Insulation materials applied to carbon steel shall be Mass Load Corrosion Rate (MLCR) tested per ASTM 1617.
- F. Foam insulation materials shall not utilize CFC or HCFC blowing agents in the manufacturing process.
- G. General: All materials, sealants, adhesives, etc. shall be low-VOC.
- H. Cellular Glass:

1. Products:
 - a. Pittsburgh Corning Corporation; FOAMGLASS® ONE™ Insulation.
 - b. Specialty Products & Insulation Company (SPI), Lancaster, PA.
 - I. Glass Mineral Wool Blanket Insulation:
 1. Products:
 - a. Knauf Insulation; Atmosphere Duct Wrap with Ecose® Technology
 - b. CertainTeed Corp.; Duct Wrap.
 - c. Johns Manville; Microlite Duct Wrap or Microlite EQ.
 - d. Owens Corning; All-Service Duct Wrap Type 150.
 - J. Glass Mineral Wool Board Insulation:
 1. Products:
 - a. Knauf Insulation; Earthwool Insulation Board with Ecose® Technology for temperatures up to 450° F.
 - b. CertainTeed Corp.; Commercial Board.
 - c. Johns Manville; 800 Series Spin-Glas, Type 814.
 - d. Owens Corning; Fiberglas 700 Series for operating temperatures up to 450°F.
- 2.2 INSULATING CEMENTS
- A. Mineral-Fiber Insulating Cement: Comply with ASTM C 195.
 - B. Expanded or Exfoliated Vermiculite Insulating Cement: Comply with ASTM C 196.
 - C. Mineral-Fiber, Hydraulic-Setting Insulating and Finishing Cement: Comply with ASTM C 449/C 449M.
- 2.3 ADHESIVES
- A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated, unless otherwise indicated.
 - B. Cellular-Glass and Polyisocyanurate Adhesive: Solvent-based resin adhesive, with a service temperature range of minus 75 to plus 300 deg F.
 1. Products:
 - a. Foster Products Corporation, H. B. Fuller Company; 81-84.
 - b. Pittsburg Corning, PC 99 2k Adhesive.
 - C. Mineral-Fiber Adhesive: Comply with MIL-A-3316C, Class 2, Grade A.
 1. Products:
 - a. Foster Products Corporation, H. B. Fuller Company; 85-70.
 - b. Eagle Bridges - Marathon Industries, Inc.; 225.
 - D. ASJ Adhesive, and FSK and PVDC Jacket Adhesive: Comply with MIL-A-3316C, Class 2, Grade A for bonding insulation jacket lap seams and joints.

1. Products:
 - a. Foster Products Corporation, H. B. Fuller Company; 85-70.
 - b. Eagle Bridges - Marathon Industries, Inc.; 225.

E. PVC Jacket Adhesive: Compatible with PVC jacket.

1. Products:
 - a. Dow Chemical Company (The); 739, Dow Silicone.

2.4 MASTICS

- A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

2.5 LAGGING ADHESIVES

- A. Description: Comply with MIL-A-3316C Class I, Grade A and shall be compatible with insulation materials, jackets, and substrates.

2.6 SEALANTS

- A. Sealants shall be provided per manufacturer's installation recommendations.

2.7 FIELD-APPLIED JACKETS

- A. Duct Sound Lagging: Reinforced, loaded vinyl noise barrier.

1. Products:
 - a. Kinetics; KNM-100 AL
 - b. Sound seal; B-10R
 - c. Unger Technologies, Inc.; Model DL-10-LAG
2. Sound Transmission Class (STC) rating: 26.
3. Density: 1 pound per square foot.

2.8 DUCT SOUND LINING (Refer to Division 23 Section: "HVAC Air Distribution.")

PART 3 - EXECUTION

3.1 COMMON INSTALLATION REQUIREMENTS

- A. Install insulation products and accessories in accordance with manufacturer's written installation requirements.
- B. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, and fittings, and piping including fittings, valves, and specialties. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, and pipe system as specified in insulation system schedules. Install insulation continuously through hangers and around anchor attachments. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at anchors and other projections with vapor-barrier mastic. Install insulation with factory-applied jackets. Finish installation with

systems at operating conditions. Repair joint separations and cracking due to thermal movement. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4 inches beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

- C. Cut and install insulation in a manner to avoid compressing insulation more than 25 percent of its original nominal thickness.

3.2 INSULATION APPLICATION SCHEDULE

- A. Acceptable insulation materials, thickness and vapor retarder requirements are identified for each application and size range. If more than one material is listed for an application and size range, selection from the materials listed is Contractor's option.
- B. Items Not Insulated: Unless otherwise indicated, do not install insulation on the following:
 - 1. Fire-suppression piping.
 - 2. Factory-insulated flexible ducts.
 - 3. Factory-insulated plenums and casings.
 - 4. Flexible connectors.
 - 5. Vibration-control devices.
 - 6. Factory-insulated access panels and doors.
- C. All supply and outside air ductwork with internal sound lining shall be externally insulated.
- D. Where metal ducts are specified to have internal duct liner, the thickness of the external insulation may be reduced by one inch, except minimum duct external insulation thickness shall be 1 inch.

3.3 HVAC DUCTWORK INSULATION APPLICATION SCHEDULE

- 1. Unconditioned spaces include locations where summer temperature and humidity conditions are similar to outdoor conditions (such as mechanical rooms ventilated with unconditioned outdoor air, parking garages, pedestrian tunnels, etc.)
 - 2. Top of ductwork located outdoors shall be provided with polyurethane board insulation of equal thickness to sides and bottoms. Taper insulation to shed water, minimum ¼" per foot slope, with insulation thickness at low edges equal to scheduled insulation thickness.
 - 3. All diffuser cones, air valves, damper boxes, HVAC equipment, coils, coil headers, casings, plenums, air measuring devices, chilled beams, etc. shall be insulated.
- A. Indoor Supply-Air Ducts, Plenums and Accessories: (Refer to Note 1 and Note 3)
 - 1. Concealed:
 - a. Insulation Material: Mineral-Fiber Blanket
 - b. Insulation Thickness: 1 ½"
 - c. Vapor Retarder Required: Yes
 - 2. Exposed:
 - a. Insulation Material: Mineral-Fiber Board
 - b. Insulation Thickness: 1 ½"
 - c. Vapor Retarder Required: Yes
 - 3. Attic Spaces and Unconditioned Spaces (Refer to Note 1):
 - a. Insulation Material: Mineral-Fiber Board

- b. Insulation Thickness: 2"
 - c. Vapor Retarder Required: Yes
- B. Indoor Return-Air Ducts, Relief-Air Ducts, And Plenums
 - 1. In locations other than attics and unconditioned spaces
 - a. Insulation Material: None
 - b. Insulation Thickness: N/A
 - c. Vapor Retarder Required: N/A
 - 2. Attic Spaces and Unconditioned Spaces (Refer to Note 1)
 - a. Insulation Material: Mineral-Fiber Board
 - b. Insulation Thickness: 1"
 - c. Vapor Retarder Required: Yes
 - 3. Between Relief-Air Damper and Outdoors (Louver, louvered penthouse, etc.)
 - a. Insulation Material: Mineral-Fiber Board
 - b. Insulation Thickness: 2"
 - c. Vapor Retarder Required: Yes

3.19 FIELD APPLIED JACKET APPLICATION SCHEDULE

- A. Indoor, All Locations, Fittings and valves in piping systems at service temperatures 200 degrees F and below.
 - 1. Field Applied Jacket Type: Factory Fabricated PVC Covers
- B. Indoor, exposed insulated ductwork greater than 12 feet of floor.
 - 1. Field Applied Jacket Type: None
- C. Indoor, concealed insulated ductwork.
 - 1. Field Applied Jacket Type: None
- D. Ductwork in high noise areas (as indicated on the drawings).
 - 1. Field Applied Jacket Type: Duct Sound Lagging (Refer to Note 2)
- E. Piping in sound sensitive areas (as indicated on the drawings)
 - 1. Field Applied Jacket Type: Pipe Sound Lagging (Refer to Note 2)

Jacket Application Schedule Notes:

- 1. Including factory insulated equipment without factory applied jacket.
- 2. If ductwork or piping indicated to have sound lagging also requires an additional field jacket, install sound lagging between insulation and additional field jacket.

END OF SECTION

SECTION 23 30 00 - HVAC AIR DISTRIBUTION

PART 1 - GENERAL

1.1 SYSTEM PERFORMANCE REQUIREMENTS

- A. The duct system design, as indicated, has been used to select and size air moving and distribution equipment and other components of the air system. Changes or alterations to the layout or configuration of the duct system must be specifically approved in writing. Accompany requests for layout modifications with calculations showing that the proposed layout will provide the original design results without alteration of system performance, including increasing the system total pressure.
- B. Variation of duct configuration or sizes other than those of equivalent or lower loss coefficient is not permitted except by written permission of Architect/Engineer.

1.2 SUBMITTALS

- A. Product data including performance data and manufacturers technical details of construction relative to materials, weights, dimensions of individual components, schedules for each type of air devices, terminal units, etc. (fire dampers, smoke dampers, etc.) with location/designation/size/model number, profiles, accessories and finishes.
- B. Shop Drawings:
 - 1. Submit duct fabrication drawings, drawn to scale not smaller than 1/4 inch equals 1 foot, on sheets same size as Contract Drawings, indicating following:
 - a. Fabrication, assembly, and installation details, including plans, elevations, sections, details of components, and attachments to other Work.
 - b. Duct layout that further indicates pressure classifications and sizes in plan view; exhaust duct systems that further indicate classification of materials handled as specified in this Section.
 - c. Fittings.
 - d. Reinforcing details and spacing.
 - e. Seam and joint construction details.
 - f. Penetrations through fire-rated and other walls.
 - g. Terminal unit, coil, and humidifier installations.
 - h. Hangers and supports, including methods for vibration isolation and building and duct attachment.
- C. Manufacturer's Certificate: Certify products meet or exceed specified requirements.
- D. Welder Certificates: Certify welders and welding procedures employed on Work, verifying AWS qualification within previous 12 months.
- E. Manufacturer Instructions:
 - 1. Submit detailed instructions on installation requirements, including storage and handling procedures.
 - 2. Submit special procedures for glass-fiber ducts.

1.3 QUALITY ASSURANCE

- A. Installer: A firm with at least 5 years experience on projects with ductwork system, VAV, terminal units, etc. similar to this project.
- B. SMACNA Compliance: Comply with SMACNA duct construction standards (high, medium and low pressure) latest editions as of date of issue of these specifications.
 - 1. Perform Work according to SMACNA 1884 and 1966.

1.4 QUALIFICATIONS

- A. Installer: Company specializing in performing Work of this Section with minimum three years' documented experience and approved by manufacturer.
- B. Welders: AWS qualified within previous 12 months for employed weld types.
- C. Licensed Professional: Professional engineer experienced in design of specified Work and licensed at Project location

PART 2 - PRODUCTS

2.1 DUCT MATERIALS

- A. Galvanized Steel Ducts: ASTM A653 galvanized steel sheet, lock-forming quality, having G60 zinc coating of in conformance with ASTM A90.
- B. Fasteners: Rivets, bolts, or sheet metal screws.
- C. Hanger Rod: ASTM A36; galvanized steel continuously threaded.
- D. Reinforcing Shapes and Plates: Unless otherwise indicated, provide galvanized steel reinforcing where installed on galvanized sheet metal ducts. For aluminum and stainless steel ducts provide reinforcing of compatible materials.
- E. Tie Rods: Galvanized steel. ¼-inch minimum diameter for 36-inch length or less; 3/8-inch, minimum diameter for lengths longer than 36 inches.
- F. General: Furnish and install miscellaneous materials and products of types and sizes indicated and, where not otherwise indicated, provide type and sizes necessary to comply with duct system requirements, including proper connection of ductwork and equipment.

2.2 DUCT APPLICATIONS AND SEALING

- A. Static-Pressure and Seal Classes: Unless otherwise indicated, construct according to the following:
 - 1. Supply:
 - a. Supply Fan to Terminal Box
 - 1) SMACNA Pressure Class: 4" Positive
 - b. Terminal Box to Terminal Diffuser/Grille/Register

- 1) SMACNA Pressure Class: 2" Positive
 - c. Supply Fan to Terminal Diffuser/Grille/Register
 - 1) SMACNA Pressure Class: 3" Positive
 - 2. Return/Exhaust
 - a. Terminal Box to Return Fan/Exhaust Fan
 - 1) SMACNA Pressure Class: 4" Negative
 - b. Terminal Equipment (Diffuser/Grille/Register) To Return/Exhaust Box
 - 1) SMACNA Pressure Class: 2" Negative
 - c. Terminal Equipment (Diffuser/Grille/Register) To Return Fan/Exhaust Fan
 - 1) SMACNA Pressure Class: 3" Negative
 - 3. Provide 18 gauge minimum duct construction for the first ten (10) feet of supply and return ducts connected to all air handling units. Additionally, provide 18 gauge minimum duct construction for all ductwork located in shafts, including top and bottom elbows/tees.
- B. Duct Sealing:
 - 1. Seal ducts for duct static-pressure, seal classes, and leakage classes specified in "Duct Schedule" Article according to SMACNA's "HVAC Duct Construction Standards – Metal and Flexible". All ducts shall be completely sealed.
 - 2. All ducts shall be sealed. As a minimum, seal ducts to the following seal classes according to SMACNA's "HVAC Duct Construction Standards – Metal and Flexible"

2.3 DUCT SYSTEMS FABRICATION

- A. General: Except as otherwise indicated, fabricate rectangular ducts with galvanized sheet steel or aluminum; in accordance with SMACNA 1966 "HVAC Duct Construction Standards," Latest Edition, Tables 2-1 through 2-52, including their associated details. Conform to the requirements in the referenced standard for metal thickness, reinforcing types and intervals, tie rod applications, and joint types and intervals.
 - 1. Fabricate rectangular ducts in lengths appropriate to reinforcement and rigidity class required for pressure classification.
 - 2. Provide materials that are free from visual imperfections such as pitting, seam marks, roller marks, stains, and discolorations.
 - 3. Make allowance for internal duct lining where required.
 - 4. Determine duct gauges for the longest duct side and use for all 4 sides. Joints and reinforcing requirements apply to the longest duct side.
 - 5. Reinforce all ducts to prevent buckling, vibration or noise as recommended in the referenced construction standards and as required to suit the installed conditions.
 - 6. Do not crossbreak duct which will receive rigid insulation covering.
 - 7. Where tap sizes of divided flow fittings are not indicated, make branch and main connection sizes proportional to their respective air flows and maintain uniform transverse velocities in the fittings.

8. Make radius elbows and radius tee connection with throat radius equal to or greater than 1-1/2 centerline width of the duct. Use vaned elbows where shown and where radius elbows will not fit the space in all square bends.
 9. Turning vanes shall be the airfoil type with extended trailing edges 36" maximum length. Where longer vanes are required, use 2 or more sets of vanes with intermediate runners securely fastened together.
 10. Bolts, screws, rivet or spot weld reinforcing members securely to the duct on not less than 6" centers.
 11. Where ducts are open ended without grilles, registers or other means of stiffening, reinforce and stiffen the open end with standing seams or an angle frame.
 12. Paint all cut ends on galvanized angles, rods and other uncoated surfaces with aluminum paint.
 13. Where ductwork is not painted or otherwise finished, remove all exposed traces of joint sealers, manufacturer's identification and other markings.
 14. Refer to paragraph 2.26 B for Manual Volume Control Dampers specification.
- B. Crossbreaking or Cross Beading: Crossbreak or bead duct sides that are 19 inches and larger and are 20 gauge or less, with more than 10 sq. ft. of unbraced panel area, as indicated in SMACNA "HVAC Duct Construction Standard," Figures: 4-1 and 4-2, unless they are lined or are externally insulated.
- C. Rectangular Duct Fittings: Fabricate elbows, transitions, offsets, branch connections, and other duct construction in accordance with SMACNA "HVAC Metal Duct Construction Standard," Latest Edition, Figures 2-1 through 2-10.
1. Slide-on Transverse Joint Connectors
Prefabricated slide-on transverse duct connectors and components will be accepted.
 - a. Duct constructed using prefabricates systems will refer to the manufacturer's guidelines for sheet gauge, intermediate reinforcement size and spacing and proper joint reinforcement(s).
 - b. Manufacturers of prefabricated systems must have duct construction and reinforcement guidelines along with supporting independent leakage and deflection performance testing. Manufacturer's prefabricated systems printed assembly and installation procedures must be adhered to during all phases.
 - c. All components of prefabricated system must be clearly embossed with manufacturer's marking and systems manufacturer clearly identified on all duct labels. No substitution of system components is permitted.
Approved Manufacturer: Ductmate Industries or Ward Duct Connectors Incorporated "W.D.C.I."
- D. Transverse Duct Connection System
1. Manufacturers:
 - a. Ductmate Industries, Inc.
 - b. TDC
 - c. MEZ Industries
 2. Furnish materials in accordance with all applicable codes, standards and local authorities having jurisdiction requirements. Provide SMACNA recommended

- rigidity class connections, interlocking angle and duct edge connection systems with sealant gaskets, cleats, and corner clips.
3. All transverse joints and intermediate reinforcement on rectangular ducts shall be as shown in SMACNA standards. Transverse joints shall be selected consistent with the specified pressure classification, material and other provisions for proper assembly of ductwork.
- a. Slide-on Flanges:
- 1) Description: Add on factory-fabricated, slide-on transverse flange connectors, gaskets, and components.
 - 2) Material: galvanized steel, Stainless 304 or 316, Aluminum, Aluminized, PVC coated, Galvannealed, or Black Iron.
 - 3) Gauge and Shape: For duct constructed using prefabricated systems, refer to the manufacturer's guidelines for sheet gauge, intermediate reinforcement size and spacing, and proper joint reinforcement.
 - 4) Manufacturers or prefabricated systems must provide duct construction and reinforcement guidelines along with independent testing for leakage, deflection, and seismic performance.
 - 5) Independent leakage testing must be for operating pressures of 10 inch wg positive and negative.
 - 6) Manufacturer's prefabricated systems printed assembly and installation procedure must be adhered to at all times.
 - 7) Manufacturer's procedures must include fastener and clean spacing along with details for all system variations including break-away and roofing connections.
 - 8) All manufactured system components must be clearly embossed with manufacturer's name or markings. No substitution of manufacturer's system components is permitted.
- b. Longitudinal Seams: Select seam types and fabricate according to SMACNA's "HVAC Duct Construction Standards – Metal and Flexible", Figure 2-2, "Rectangular Duct/Longitudinal Seams", for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provisions in SMACNA's "HVAC Duct Construction Standards – Metal and Flexible".
- c. Elbows, Transitions, Offsets, Branch Connections, and other Duct Construction: Select types and fabricate according to SMACNA's "HVAC Duct Construction Standards – Metal and Flexible", Chapter 4, "Fittings and Other Construction" for static-pressure class, applicable sealing requirements, materials involved, duct-support intervals, and other provision in SMACNA's "HVAC Construction Standards – Metal and Flexible".
4. Casings
- a. Fabricate casings in accordance with SMACNA HVAC Duct Construction Standards – Metal and Flexible and construct for operating pressures indicated.
- b. Reinforce access door frames with steel angles tied to horizontal and vertical plenum supporting angles. Furnish hinged access doors where indicated or required for access to equipment for cleaning and inspection. Furnish clear wire glass observation ports, minimum 6 x 6 inch size.

- c. Fabricate acoustic casings with reinforcing turned inward. Furnish 16 gage back facing and 22 gauge perforated front facing with 3/32 inch diameter holes on 5/32 inch centers. Construct panels 3 inches thick packed with 4.5 lb./cu ft minimum glass fiber media, on inverted channels of 16 gage.
- E. Welding:
 - 1. Continuously Welded Round and Oval Duct Fittings: Two gages heavier than duct gages according to SMACNA 1966.
 - 2. Cemented Slip Joints:
 - a. Minimum 4 inches.
 - b. Brazed or electric welded.
 - 3. Prime coat welded joints.
- F. Manufactured Turning Vanes:
 - 1. Furnish and install single thickness, multiple radius, airfoil steel turning vanes. Static pressure loss for square ducts shall be no more than 20% of velocity head. Turning vanes shall be furnished with a mounting plate to facilitate installation in ductwork. Turning vanes shall be Harper double wall turning vanes fabricated from the same material as the duct. Turning vane front and back panels shall be securely locked together with adequate crimping to prevent twisting of vane. Vane shall be capable of withstanding 250 pounds of tensile load when secured according to the manufacturer's instruction. Rails for mounting turning vanes shall have self locking friction fit tabs designed to facilitate proper alignment of vanes. Tab spacing shall be as specified in Figure 4-3 of the 2005 SMACNA Manual, "HVAC Duct Construction Standards, Metal & Flexible" Third Edition standard. Rail systems with non-compliant tab spacing shall not be accepted. Acoustical Turning Vane: Shall be used in applications that required quiet operating systems. Mounting rails shall have friction insert tabs that align the vanes automatically. Turning vanes shall be Tuttle and Bailey Model AOOA, Ductmate "PRO-rail," or acceptable comparable product.
- G. Round Branch Fittings:
 - 1. Provide take off fittings manufactured with airtight seams using a locking double seam. Units shall be constructed of 26 gauge galvanized steel (minimum). Units shall have a factory installed volume damper with locking spring loaded quadrant. Damper regulator shall be elevated 2" to allow for insulation thickness. Fitting shall be conical type as described on the plans with a base mounting flange secured by a minimum of four sheet metal screws or pop-rivets. See drawings for alternate "Streamline" branch take-off fittings. All High Efficiency Take-Offs, Conicals, and Collars must have a factory applied gasket along all rivets, co-latches, and flange. All fittings shall be constructed from a minimum of 26 gauge steel. All dampered fittings must have low-leakage hardware with closed-end bearings. Manufacturer: Ductmate Industries "GreenSeam Fittings" or acceptable comparable product.
- H. Spin-in Fittings
 - 1. Furnish and install spin-in fittings where indicated on the contract drawings, Royal Metal Products Model No. 168 or acceptable comparable product, provide

with balancing damper as manufactured by Duro Dyne, Ductmate Industries or acceptable comparable product.

- a. Material shall be of same construction as duct main.

2.4 FLEXIBLE DUCT

A. Air Devices to Supply/Return Branch Ducts:

1. Flexible ductwork shall be Atco UPC #036 or comparable acceptable product, UL listed for Class 1 Air Ducts, Standard 181. Ducts shall be rated for positive pressure of 10" W.G. and negative pressure of 2" W.G. per UL 181.
2. Description:
 - a. UL 181, Class 1, aluminum laminate and polyester film with latex adhesive supported by helical-wound spring steel wire.
 - b. Insulation: Fiberglass.
 - c. Vapor Barrier Film: polyethylene
 - d. Pressure Rating: 10-inch wg positive and 1.0-inch wg negative.
 - e. Maximum Velocity: 4,000 fpm
 - f. Temperature Range: Minus 20 to plus 210 degrees F
3. Limit flexible duct 6' maximum. Install flexible ducts, using all recommended fittings, couplings and accessories. Support ducts with wide straps spaced so that horizontal runs do not sag more than 3" in 3'. Cover with duct tape and fasten with duct strap clamps. 180° bends in flexible duct are prohibited.

B. Flexible Ducts at Fan Coil Units, Fan Powered VAV Boxes:

1. Flexible ducts shall be rated for a negative working pressure of 2 inches w.g.
2. Flexible ducts shall comply with latest NFPA Bulletin 90A.
3. Flexible ducts shall be Quietflex Type HPD Flex™ or comparable acceptable product.
4. Flexible ducts shall be ISO 9001: 2000 certified.
5. Flexible ducts shall be Formaldehyde-free and shall be GreenGuard certified.

C. Flexible Duct Elbow Supports:

1. Flexible Duct Elbow Supports shall be Build Right Products-Flex® or comparable acceptable product.
 - a. Universal-mount 1-piece, fully adjustable, radius-forming brace to support 4-inch through 16-inch diameter flexible air ducts.
 - b. Classified: UL 2043.
 - c. Material: 100 percent recycled copolymer polypropylene.
 - d. Support Frame Radius: 8 inches.
 - e. Compliance for Flexible Duct Radius:
 - 1) SMACNA HVAC Duct Construction Standards.
 - 2) ASHRAE Advanced Energy Design Guides.
 - 3) ADC Flexible Duct Performance and Installation Standards.

2.5 FLEXIBLE DUCT CONNECTORS

- A. Indoor Installation: UL listed fire retardant neoprene or vinyl-coated woven fiberglass fabric. Minimum density 30 oz./sq. yd. Rated to constant maximum temperature of 200 deg. F.
 - 1. Acceptable Manufacturers, subject to compliance with requirements:
 - a. VentFabrics, Inc, model "Ventglas".
 - b. Duro-Dyne Corp, model 10012 MF6N Specification Grade Neoprene, Super Metalfab."
 - c. Ductmate Industries, Inc., model PROflex.

2.6 AIR DEVICES

- A. General:
 - 1. Furnish and install air devices where indicated on the contract drawings. Diffusers, registers and grilles shall be of sizes, shapes, capacities and types as indicated on the contract drawings, as required for a complete installation.
 - 2. Performance: Provide diffusers, registers, and grilles that have, as minimum, throw, pressure drop, and noise criteria ratings for each size device as listed in manufacturer's current data.
 - 3. Ceiling Compatibility: Provide diffusers, registers and grilles with border styles that are compatible with adjacent ceiling systems, and that are specifically manufactured to fit into ceiling system with accurate fit and adequate support. Refer to general construction drawings and specifications for types of ceiling systems, which will contain each type of ceiling air diffuser.
 - 4. For flush mounting, diffuser housing shall be mounted above ceiling surface with flush perimeter flange and gasket to seal against ceiling.
 - 5. For lay-in mounting, diffuser housing shall be sized to fit between ceiling exposed suspension tee bars and rest on top surface of tee bar.
 - 6. For wet or humid areas the air devices shall be of aluminum construction.
- B. Air device selections are based on manufacturers Model numbers indicated on the contract drawings. The following products of: Titus (Basis of Design), Carnes, Hart & Cooley, Kruger, Metalaire, Price, Nailer, or Tuttle & Bailey, Inc. will be accepted provided they meet application, performance and design criteria requirements.
- C. Diffusers, registers and grilles shall be furnished with factory installed adjustable baffles to provide air patterns shown on the plans.
- D. Air distribution devices have been specifically selected based on Titus performance data. If devices are submitted, other than those specified, the submittal must include an item by item selection of substitutions listed by space location. This list must include model number, size, air pattern, airflow, pressure drop, throw, NC noise level, finish and mounting method for both the submitted and specified device. Where compliance with performance required different dimensions, such as neck or ace size, than the specified item, the submittal must note where these dimension changes occur listing both the original and new dimensions.
- E. Finishes of all air devices shall be baked on enamel, colors shall be selected by Architect.

- F. Where air terminal devices are installed in duct collars or branches, furnish and install air extractors. Furnish and install control grids, volume dampers and/or other accessories necessary to ensure uniform air flow across the terminal devices. Accessories shall be of the same material as the terminal device. Install fixed blade terminals so that blades block the normal line of vision. Furnish 3 of each type of removable key operators.

2.7 DUCTWORK ACCESSORIES

A. Manual Volume Control Dampers

1. General:

- a. Provide factory-fabricated volume-control dampers, complete with required hardware and accessories. Stiffen damper blades to provide stability under operating conditions. Provide locking device to hold single-blade dampers in a fixed position without vibration. Close duct penetrations for damper components to seal duct consistent with pressure class. Provide end bearings or other seals for ducts with pressure classifications of 3 inches or higher. Extend axles full length of damper blades. Provide bearings at both ends of operating shaft. All dampers shall be provided with shaft seals to prevent air leakage.
- b. Where damper or splitter control rods extend through finished walls or ceilings, terminate rods in approved access box equal to Young No. 1 surface mounted quadrant regulator.
- c. All splitter rods shall be provided with Young No. 656-3/8" or 659 – 1/2" end bearings using two (2) bearings per splitter damper.
- d. All ducts larger than 12 x 12 shall be provided with opposed blade dampers.
- e. For square ductwork smaller than 12x12 utilize the following damper:
 - 1) Control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules.
 - 2) Damper blades shall be 16 ga. Galvanized steel 3V type with three longitudinal grooves for reinforcement. Blades shall be completely symmetrical relative to their axle pivot point, presenting identical resistance to airflow and operation in either direction through the damper (blades that are non-symmetrical relative to their axle pivot point or utilize blade stops larger than 1/2 inch are unacceptable). Blade seals shall be TPE. Linkage shall be blade-to-blade concealed in jamb (out of the airstream) to protect linkage and reduce pressure drop and noise.
 - 3) Damper frame shall be 16 ga. galvanized steel formed into a structural hat channel shape with reinforced corners to meet 11 ga. criteria. Bearings shall be corrosion resistant, permanently lubricated, synthetic (acetal) sleeve type rotating in extruded holes in the damper frame for maximum service. Axles shall be square and positively locked into the damper blade. Jamb seals shall be flexible stainless steel compression type to prevent leakage between blade end and damper frame.
 - 4) The damper manufacturer's submittal data shall certify all air leakage and air performance pressure drop data in accordance with the AMCA Certified Rating Program for Test Figures 5.2, 5.3 and 5.5. Damper air performance data shall be

- developed in accordance with the latest edition of AMCA Standard 500-D.
- 5) Basis of design shall be Greenheck model VCD-23, comparable products as manufactured by Ruskin or American Warming and Ventilation may submitted for consideration.
- f. For Round Ductwork 12" in. Diameter and Smaller Utilize the following damper:
- 1) Round control dampers meeting the following specifications shall be furnished and installed where shown on plans and/or as described in schedules. Dampers shall consist of 20 ga. galvanized steel frame, blades fabricated from 20 ga. galvanized steel, and ½ in. dia. plated steel axles turning in bronze bearings and EPDM blade seals.
 - 2) Damper manufacturer's printed application and performance data including pressure, velocity, and temperature limitations shall be submitted for approval velocities to 3,000 fpm temperatures to 250°F and leakage to 4cfm/ft² @ 1 in. wg.
 - 3) Testing and rating to be in accordance with AMCA Standard 500-D.
 - 4) Basis of design shall be Greenheck model VCDR-53, comparable products as manufactured by Ruskin or American Warming and Ventilation may be submitted for consideration.
2. Manufacturers:
- a. Subject to compliance with requirements, provide dampers of one of the following:
 - 1) Ruskin Manufacturing.
 - 2) American Warming & Ventilating
 - 3) Greenheck Corporation
 - b. Model numbers and features listed below are based on Ruskin Manufacturing.
3. Standard Duty Manual Volume Dampers:
- a. Frame: 16 gauge galvanized steel structural hat channel with reinforced tabbed corners.
 - b. Blades: 6" wide, single skin, 16 gauge galvanized steel with three longitudinal grooves for reinforcement.
 - c. Linkage: Concealed in frame, out of the airstream.
 - d. Axles: ½" plated steel hex, positively locked.
 - e. Bearings: Molded synthetic, corrosion resistant.
 - f. Blade seals: PVC coated polyester fabric mechanically locked into the blade edge. Jamb seals shall be flexible metal between blade and frame.
 - g. Control shaft: ½" diameter, removable steel shaft.
 - h. Maximum system velocity: 1500 FPM.
 - i. Temperature range: -25°F to +180°F.
 - j. Maximum system pressure:
 - 1) 48" width = 2.5 in. wg.
 - 2) 36" width = 3.0 in. wg.
 - 3) 24" width = 4.0 in. wg.
 - 4) 12" width = 5.0 in. wg.
 - k. Selection based on Ruskin Model No. CD36.

- I. Application: Parallel blade for mixing air streams and exhaust air duty. Opposed blade for outdoor air ductwork upstream of air monitoring station and adjacent to intake louvers suitable for horizontal or vertical installations.
- B. Furnish and install access doors and/or panels in high and low pressure ducts, where indicated or required to provide access for control devices, including but not limited to; control dampers, fire dampers, smoke dampers, airflow monitoring stations, etc.
 1. Access doors in low velocity ducts shall be equal to Prefco CAD-101 or Ductmate "Square Framed Access Doors." Doors shall have galvanized steel frame, with 1" thick, 1-1/2 pcf fiberglass insulation with 24 gauge galvanized steel inner and outer panels. Doors shall be furnished with cam locks.
 2. Doors shall be rated for installation in duct systems with pressures up to 8 in w.g. Where required for fire dampers, doors shall be furnished as a factory fabricated unit along with extended sleeve and fire damper (installed downstream of fire damper). Frame shall be 20 gauge galvanized steel with reinforced corners. Doors shall be 20 gauge galvanized steel sheet with 1" inch thick foil faced duct liner insulation, sandwiched to 22 gauge perforated inner line. Door panels shall have spring clips designed to relieve a minimum of 150 cfm at 2 1/2" negative. Panels shall be: 10" x 10" on ducts less than 12" diameter; 12" x 18" on ducts from 12" to 24" diameter; and 18" x 18" on ducts from 26" to 36" diameter.
 3. Systems 4" w.g. and above shall utilize a sandwich-type access door. Construct doors in accordance with Figure 7-3 of the 2005 SMACNA Manual, "HVAC Duct Construction Standards, Metal & Flexible" Third Edition. Manufacturer: Ductmate Industries "Sandwich" style door or acceptable comparable product.
 4. All grease duct access doors used shall be accompanied by independent testing in conjunction with each manufacturer's respective wrap system for high temperature applications.

PART 3 - EXECUTION

3.1 DUCT INSTALLATION, GENERAL

- A. Metal Ducts: Install in accordance with SMACNA 1966 Duct Construction Standards – metal and flexible.
- B. Insulated Flexible Duct Fittings:
 1. Join each flexible duct section to main trunk duct through sheet metal fittings.
 2. Material: Galvanized steel.
 3. Equip fittings with factory-installed volume damper having positive locking regulator.
 4. Provide insulation guard with fittings installed in lined ductwork.
- C. Duct System Pressure Class: Construct and install each duct system for the specific duct pressure classification indicated.
- D. Install ducts with the fewest possible joints.
- E. Use fabricated fittings for all changes in directions, changes in size and shape, and connections.

- F. Install couplings tight to duct wall surface with projections into duct at connections kept to a minimum.
- G. Locate ducts, except as otherwise indicated, vertically and horizontally, parallel and perpendicular to building lines; avoid diagonal runs. Install duct systems in shortest route that does not obstruct useable space or block access for servicing building and its equipment.
- H. Install ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.
- I. Provide clearance of 1 inch where furring is shown for enclosure or concealment of ducts, plus allowance for insulation thickness, if any.
- J. Install insulated ducts with 1-inch clearance outside of insulation.
- K. Conceal ducts from view in finished and occupied spaces by locating in mechanical shafts, hollow wall construction, or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown.
- L. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.
- M. Electrical Equipment Spaces: Route ductwork to avoid passing through transformer vaults and electrical equipment spaces and enclosures.
- N. Non-Fire-Rated Partition Penetrations: Where ducts pass interior partitions and exterior walls, and are exposed to view, conceal space between construction opening and duct or duct insulation with sheet metal flanges of same gage as duct. Overlap opening on 4 sides by at least 1-½ inches.
- O. Seam and Joint Sealing:
 - 1. General: Seal duct seams and joints as follows:
 - a. Seal all transverse joints, longitudinal seams, and duct penetrations.
 - 2. Seal externally insulated ducts prior to insulation installation.
- P. Connections:
 - 1. General: Installation specified is for conventional connections not exposed to the weather, high heat, or corrosive agents.
 - 2. Equipment Connections: Connect equipment with flexible connectors in accordance with Division 23 Section: "HVAC Distribution."
 - 3. Branch Connections: Comply with SMACNA "HVAC Air Duct Construction Standards," Figures 2-7 and 2-8.
 - 4. Outlet and Inlet Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figures 2-16 through 2-18.
 - 5. Terminal Units Connections: Comply with SMACNA "HVAC Duct Construction Standards," Figure 2-19.
 - 6. Thermometers and controllers: Cut openings in ductwork to accommodate thermometers and controllers. Cut pitot tube openings for testing of systems, complete with metal can with spring device or screw to eliminate against air leakage.

Q. Field Quality Control:

1. Disassemble, reassemble, and seal segments of the systems as required to accommodate leakage testing, and as required for compliance with test requirements.

R. Adjusting and Cleaning:

- a. Adjust volume control devices as required by the testing and balancing procedures to achieve required air flow. Refer to Division 23 Section: "TESTING, ADJUSTING, AND BALANCING for HVAC" for requirements and procedures for adjusting and balancing air systems.
- b. Vacuum duct systems prior to final acceptance to remove dust and debris.
- c. During construction install temporary closures of metal or taped polyethylene on open ductwork to prevent dust from entering ductwork system.

S. Installation of Flexible Duct Elbow Supports

1. Install flexible duct elbow supports in accordance with manufacturer's instructions.
2. Install flexible duct elbow supports over outer jacket of flexible ducts to form smooth, 90-degree ends to eliminate flexible duct kinks and airflow restrictions.
3. Make bends in flexible ducts with minimum of 1-duct diameter centerline radius.
4. Install flexible duct elbow supports at flexible duct 90-degr bends at following locations:
 - a. Diffusers.
 - b. Grilles.
 - c. Registers.
 - d. Air devices with round inlets and outlets.
 - e. HVAC equipment with round inlets and outlets.
 - f. Flexible ducts used as elbows.
 - g. As indicated on the Drawings.

3.2 LEAK TESTING AIR DISTRIBUTION AND DUCT SYSTEMS

A. Duct Leak Testing:

1. Test the entire ductwork air distribution system.
2. Disassemble, reassemble, and seal segments of systems to accommodate leak testing and for compliance and test requirements.
3. Prior to installing insulation, conduct tests in accordance with SMACNA HVAC air duct leakage testing procedures of reach section of the system. If pressure classifications are not indicated, test entire system at the maximum system operating pressure. Do not pressurize systems above the maximum design operating pressure.
4. Determine leakage from entire system or from each section of the system being tested by relating leakage to the surface area of the test section.

5. Maximum Allowable Leakage: As described in SMACNA HVAC Air Duct Leakage Test Manual “latest edition”. Comply with requirements for leakage listed in Division 23 Section: “Air Distribution” – Duct Applications and Sealing.
6. Remake leaking joints as required and apply sealants to achieve specified maximum allowable leakage.
7. Record leakage testing results on forms from the SMACNA HVAC Air Duct Leakage Test Manual, “latest edition”. Submit results within one week of testing.

3.3 HANGERS AND SUPPORTS

- A. Install rigid round, rectangular, and flat oval metal duct with support systems indicated in SMACNA “HVAC Duct Construction Standards,” Tables 5-1 through 5-4 and Figures 5-1 through 5-11.
- B. Fabricate and support ducts according to SMACNA 1884 and 1966.
- C. Threaded Rods: Provide double nuts and lock washers.
- D. Building Attachments:
 1. Provide concrete inserts or structural-steel fasteners appropriate for construction materials to which hangers are being attached.
 2. If possible, install concrete inserts before placing concrete.
 3. Powder-Actuated Concrete Fasteners:
 - a. Use only for slabs more than 4 inches thick.
 - b. Install after concrete is placed and completely cured.
 - c. Do not use powder-actuated concrete fasteners for seismic restraints.
- E. Hanger Spacing:
 1. Comply with SMACNA 1884 and 1966.
 2. Install hangers and supports within 24 inches of each elbow and within 48 inches of each branch intersection.
 3. Extend strap supports down both sides of ducts and turn under bottom at least 1 inch.
 4. Secure hanger to sides and bottom of ducts with sheet metal screws.
- F. Hangers Exposed to View: Provide threaded rod and angle or channel supports.
- G. Upper Attachments:
 1. Attach to structures.
 2. Selection and Sizing: Provide pull-out, tension, and shear capacities as required for supported loads and building materials.

3.4 AIR DEVICE INLETS AND OUTLETS

- A. Installation:
 1. General: Install air outlets and inlets in accordance with manufacturer’s written instructions and in accordance with recognized industry practices to insure that products serve intended functions.
 2. Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work

- including, but not limited to; sprinkler heads, exit signs, lights, speaker systems, electrical pullbox access, architectural features and ceiling support system.
3. Locate ceiling air diffusers, registers, and grilles, as indicated on the contract drawings. Unless otherwise indicated, locate air device units in center of acoustical ceiling modules or between plaster framing supports/framing in hard ceiling construction.
 4. Paint ductwork visible behind air outlets matte black in accordance with Division 09 Section: "Paints and Coatings."
 5. Insulate the backs of supply diffusers and tape all around insulation seams.

3.5 DAMPERS, GENERAL:

- A. Provide access to damper components for maintenance of linkage, adjustments and visual inspection.
- B. All dampers shall be installed with their flange outside of the airstream.
- C. Coordinate access to damper with all trades.
- D. Install volume control dampers in lined duct with methods to avoid damage to liner and to avoid erosion of duct liner material.
- E. Install balancing dampers on duct take-off to diffusers and grilles and registers, regardless of whether dampers are specified as part of diffuser, or grille and register assembly.
- F. Test and inspect fire and fire/smoke dampers after the first year of installed service, per NFPA 80 and NFPA 105 requirements.

3.6 DUCT MOUNTED ACCESS DOORS:

- A. Install duct mounted access doors at the following locations, and as shown on the contract drawings:
 1. Spaced every 50 feet of straight duct.
- B. Duct access doors shall be installed centered in the width of the horizontal dimension or vertical dimension taking advantage of the most accessible installation for maintenance.
- C. Access doors shall not be covered with insulation.
- D. Install doors prior to performance of ductwork leak testing.

3.7 CLEANING

- A. Division 01 Section: "Execution and Closeout Requirements": Requirements for cleaning.
- B. Clean duct system and force air at high velocity through duct to remove accumulated dust.

- C. To obtain sufficient airflow, clean one half of system completely before proceeding to other half.
- D. Vacuuming:
 - 1. Clean duct systems with high-power vacuum machines.
 - 2. Install access openings into ductwork for cleaning purposes.
- E. Protect sensitive equipment with temporary filters or bypass during cleaning.

END OF SECTION

SECTION 26 05 00
COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

- 1.1 PERMITS AND FEES: Apply, pay for and secure all permits, required by the Authorities Having Jurisdiction prior to start of work. Deliver all certificates to the Owner prior to final acceptance of work.
- 1.2 CONFLICTS: Where variances occur within drawings and/or specifications, procedures of the General Conditions shall be followed. In cases where clarification is not requested prior to bidding, provide the item or arrangement of better quality, greater value, or higher cost in the Contract Price. Bring to the Architect's attention any field conflicts or existing conditions, which prevent the intended work as designed.
- 1.3 SUBMITTALS: Make all submittals in accordance with the General Conditions. Submit Material and Equipment Lists, Shop Drawings, Product Data, Coordination Drawings, Record Documents, O&M Manuals, etc. as required.
 - A. Submit all related product drawings, data sheets, layout drawings, etc. for each system or product in a single submittal. Do NOT submit product data, wiring diagrams and calculations as multiple separate submittals.
 - B. Product data PDF's shall contain only product cut sheets, data sheets or catalog pages as pertain the proposed products. Use of manufacturer's PDF catalog pages shall be limited to only those pages relevant to the proposed products. Submittals consisting of entire catalogs of other products, irrelevant data, etc. shall be returned without review.
 - C. Submittal Deviations from Contract Documents: Submittals shall explicitly identify any deviations from the drawings, specifications or design intent, including, but not limited to: different products, different locations, changes to intended application, location, capacity, rating or sizes, differences in physical size which create installation, clearance or access problems or Code violations. Clearly and specifically identify each such deviation, substitution or change for Architect's attention via note, clarification, etc. It is NOT considered to be explicitly identified simply by showing a device on the plans or including a product page in the submittal.
 - D. Closeout Submittals: Submit in accordance with the General Conditions and Division 1 requirements. Submit Electrical O&M Manuals to include the following: copies of all approved submittals, acceptance test reports (ground resistance, etc.), product warranties, factory data sheets, wiring diagrams, etc., spare parts lists, operation and instruction papers and maintenance schedules.
 - E. Record Drawings: During construction, maintain drawings black line white prints. Record all changes and alterations in red ink, including installed locations of panels, switchboards, transformers, feeders, large pullboxes and splice box locations, underground feeders, conduit, ducts, cables, handholes, manholes, etc. with installed dimensions from permanent construction elements, modifications, changes, deletions or additions made during construction. Submit one (1) complete set of white prints with "as-built" information neatly recorded at project completions.
- 1.4 QUALITY ASSURANCE: Provide products specified in this Section that are listed and labeled. Install all components and equipment per manufacturer's written instructions. All work shall comply with the latest version of all applicable Federal, State and Local codes and regulations as

adopted by the State Fire Marshal, including but not limited to: NFPA, NEC, NESC, ADA, ANSI, OSHA, UL, IBC, etc. Electrical Installer shall have current Master Electrician's License, and Local or State licenses, where required.

- 1.5 SEQUENCING: Coordinate electrical work with other trades based on phasing and sequence of construction, as identified elsewhere in the contract documents.
- 1.6 ELECTRONIC AUTOCADD DOCUMENTS: Requests for electronic Autocadd documents will be accommodated to the contractors and installers upon receipt of Bowman's Electronic Document Release Form. Only floor plans and part plan drawings shall be provided.
- 1.7 PROJECT CONDITIONS: Allowances shall be considered and included in bids for performing work within existing, occupied buildings. Certain functions, i.e. core drilling or outages shall occur during unoccupied periods, nights or weekends to minimize occupant disturbance.

PART 2 PRODUCTS

- 2.1 IDENTIFICATION PLATES Indoor & Outdoor Tags: Laminated phenolic plastic. White with black engraved letters. Stainless steel attaching screws.
- 2.2 FIRE STOPPING MATERIALS: UL 1479 Listed. For large openings or cable tray penetrations: 3M Fire Barrier or STI Spec Seal SSB Firestop intumescent pillows, or equal. For small openings and voids (less than 1"): 3M Fire Barrier or STI Spec Seal intumescent sealant, or equal. For unused/open core drilled holes and conduits: 3M Fire Barrier or STI Spec Seal FP intumescent plugs,
- 2.3 SUPPORTING DEVICES: Channel and angle support systems, hangers, anchors, sleeves, brackets, fabricated items, and fasteners are designed to provide secure support from the building structure for electrical components. Steel, except as otherwise indicated, protected from corrosion with zinc coating or with treatment of equivalent corrosion resistance using approved alternative finish or inherent material characteristics.

PART 3 EXECUTION

- 3.1 EXAMINATION: Examine site and existing conditions prior to submitting bids. Carefully examine proposed locations where work will occur in existing buildings and excavation near existing piping, conduit, cable, structures, etc. Make required allowances for the conditions.
- 3.2 UTILITY OUTAGES: Schedule and perform all work such that interruptions to existing utilities and services are kept to a minimum. No outages shall occur without prior written notification of Owner and/or User. Written notice of 15 calendar days is required.
- 3.3 INSTALLATION: Install all items level, plumb, and parallel and perpendicular to other building systems and components. Provide all clearances as required by NEC and manufacturers' requirements.
- 3.4 CONSTRUCTION
 - A. Connections to Existing Work: Keep all existing systems in operation during the progress of the work. Provide temporary connections, where necessary to maintain continuous operation. Provide all necessary alterations of existing work to make satisfactory connections between the new and existing work.
 - B. It is the intent to provide complete and operational systems. The work between

mechanical, plumbing, and electrical Divisions is complementary and is meant to produce a single and operating system. Contractor shall make its own determination as to the distribution of responsibility among the various trades.

- C. Penetration of Waterproof construction: Minimize penetration of roofs, exterior walls and interior waterproof construction. Provide curbs, sleeves, shields, flashing, fittings and caulking to make the penetrations watertight.
 - D. Penetration of Fire Rated Construction: Seal in and around all conduits and other electrical materials penetrating or creating openings in fire-rated, fire resistant or fire-stopped walls, ceilings, partitions and floors.
- 3.5 DEMOLITION: Remove and dispose of all existing materials not required for re-use or re-installation. Remove conduit, hangers, supports, etc. to a point below the finished floors or behind finished walls and cap. Cut such items flush with masonry surfaces. Remove wiring and conduit back to source panelboard or switch, or to last remaining device on the circuit. Remove conduit, hangers, supports, etc.
- 3.6 ABANDONED WIRING & CABLES: Remove all abandoned line voltage and low voltage cabling and wiring from the project scope area (including above ceilings and below access floors) per NEC requirements. This shall include all control wiring, IT/telecomm, security, video, power, lighting and any other electrical systems where the wiring is no longer in use. Removal shall include wiring and cables abandoned under this project, and those previously abandoned under prior construction projects.
- 3.7 RE-INSTALLATION: Where equipment is to be removed, and relocated or re-installed, provide careful removal of all items.
- 3.8 REPAIR/RESTORATION: Restore all finishes, equipment and surfaces to original condition, where affected by the work. Patch finished surfaces and building components using new materials matching existing materials and experienced Installers qualified with the materials and methods required for the surface and building components being patched.
- 3.9 IDENTIFICATION: Permanently identify all equipment in accordance with the project nomenclature. Panelboards, starters, disconnect – provide engraved phenolic nameplates. Identify all conductors via colored insulation or colored electrical tape at boxes, panels or enclosure where visible. Color coding as listed below, on all building wiring and feeders:
- A. 208/120V, 3P, 4W: Black/Red/Blue/White/Green.
 - B. 480/277V, 3P, 4W: Brown/ Orange/Yellow/Gray/Green
- 3.10 INSPECTIONS: Schedule, pay for (as applicable) and attend all inspections required by the Authorities Having Jurisdiction. Deliver all certificates to the Owner. Schedule preliminary and rough-in inspections in a timely manner. Any work covered prior to any inspection in a manner which, in the inspector's opinion, precludes a complete inspection, shall be uncovered at the installer's cost. Uncover Work to provide for installation of ill-timed Work.

END OF SECTION

SECTION 26 05 19
LOW VOLTAGE ELECTRICAL POWER CONDUCTORS & CABLES

PART 1 GENERAL - Not Used.

PART 2 PRODUCTS

- 2.1 METAL CLAD CABLE: Type MC metal clad cable for branch circuit applications. Interlocking aluminum or galvanized steel armor. THHN/THWN-2 insulation, 90°C dry rated. Solid Conductors through #10 AWG: Soft or annealed per ASTM B3. Stranded copper conductors for #8 AWG and larger, per ASTM B8 or B787. Insulated (green) equipment grounding conductor. UL 83, 1479, 1569 1581 listed and tested per UL 2556. NEC compliant. AFC MC, MC-Tuff, MC-Lite, or comparable product by Encore Wire, Southwire or Service Wire
- 2.2 LUMINARY METAL CLAD CABLE (MC): Type MC metal clad cable with insulated power and control conductors: For use with 0-10V dimming controlled light fixtures, as applicable. Interlocking aluminum or galvanized steel armor. Identifying blue spiral stripe or other approved markings along armor. Solid copper conductors, white or gray neutral conductor. Insulated (green) equipment grounding conductor. Separate, #16 AWG, TFN-insulated purple/gray or colored control conductors. UL 66, 83, 1479, 1569 listed and tested per UL 2556. NEC 250, 300, 330, 392, 396, 501, 502, 503, 504, 505, 518, 520, 530, 645 and 725 compliant. AFC Luminary Type MC Cables or comparable product by Southwire or Encore.
- 2.3 FIRE ALARM METAL CLAD CABLE (MC): Type MC metal clad cable with ground conductor: For use on fire alarm system circuits, as required. Interlocking galvanized steel or aluminum armor. Continuous red identifying stripe or other approved markings. Non-shielded or shielded FPLP, twisted pair conductors, as required by fire alarm manufacturer for application. Minimum #16 AWG, TFN insulated, solid copper conductors. Fire resistant and low smoke per NFPA 262. UL Listed Fire Alarm Cable. Rated for use in plenums. UL Listed for cable trays. Rated for through penetrations of 1, 2 and 3-hour firewalls per UL 1479. UL 62, 83, 910, 1424, 1569, 1581 listed and tested per UL 2556. NEC 300.21, 330, 518, 530, 645, 725, 760 compliant. AFC Type MC Fire Alarm/Control Cable or comparable product by Southwire, Encore, or Windy City Wire.
- 2.4 600 VOLT BUILDING WIRE: UL 44, 83 and 854 Listed, 600 volt, 90°C. All conductor sizes indicated are based on copper conductors. Copper, stranded for #8 AWG, and larger. Concentric per ASTM B3, B8, B787. Compact round per ASTM B496. #12 AWG minimum conductor size. Thermoplastic Insulation: Interior #8 and smaller - THWN-2 or THHN. Interior #6 and larger: - THWN-2 or THW-2. All exterior wiring - THWN-2 or THW-2. Pirelli or comparable product by Service Wire Corp, Okonite Company, Encore Wire, Southwire, Carol Cable, OmniCable, or Regency.

PART 3 EXECUTION

3.1 APPLICATION

- A. Branch Circuits: Type THHN/THWN, copper conductor, in raceway, or Type MC cable, copper conductor, 75C insulation.
- B. Fire Alarm Circuits: Type THHN/THWN, copper conductor, in raceway or Type MC Fire Alarm cable, copper conductor, 90C insulation.
- C. Class 1 Control Circuits: Type THHN/THWN, copper conductor, in raceway.
- D. Class 2 Control Circuits: Type THHN/THWN, copper conductor, in raceway or Type MC cable, copper conductors.

- 3.2 **INSTALLATION:** Install wires and cables as indicated, according to manufacturer's written instructions and the NECA "Standard of Installation." Install exposed cable, parallel and perpendicular to surfaces or exposed structural members, and follow surface contours where possible. Support per NEC, independent from ceiling hanger wires. Balance the load between each phase within 3-phase panels, as practicable.
- A. **MC Cable Installation Requirements:** Installed concealed in finished areas. Do not expose, except for final connections to modular furniture. Group all MC cables running together in bundles with nylon cable ties. Route bundles neatly through ceiling cavities. In high ceiling, or large plenum areas, install all MC cables in groups, tight to underside of deck, within steel joist webbing. Install perpendicular and parallel to column lines, except for final separation from bundles. Support bundles at regular intervals, per NEC, independent from ceiling hanger wires. Provide adequate clearance above accessible ceilings.
- 3.3 **ADJUSTING:** Provide Feeder Balancing: Make adjustments to branch circuit connections within branch circuit panelboards. Balance the load between each phase, as practicable, After branch panels are balanced, perform balancing of phase loads on distribution panels and switchboards

END OF SECTION

SECTION 26 05 26
GROUNDING AND BONDING FOR ELECTRICAL

PART 1 GENERAL - Not Used

PART 2 PRODUCTS

2.1 WIRE AND CABLE CONDUCTORS

- A. Insulated Ground Wire: Minimum sizes per NEC or larger as indicated. Green insulation.

PART 3 EXECUTION

3.1 APPLICATION: Comply with NEC Article 250, except where larger sizes or more conductors are indicated.

- A. Feeders and Branch Circuits: Install separate insulated equipment grounding conductors with circuit conductors.

END OF SECTION

SECTION 26 05 33
RACEWAYS AND BOXES FOR ELECTRICAL

PART 1 GENERAL - Not Used.

PART 2 PRODUCTS

2.1 METAL CONDUIT AND TUBING

- A. Electrical Metallic Tubing (EMT): UL 6 Listed. Steel, thin-wall, electro-galvanized. Minimum Size: 3/4 inch.
- B. Flexible Metal Conduit (Greenfield): Zinc-coated steel. UL 1 Listed. Electro-galvanized or zinc-coated steel.

2.2 CONDUIT FITTINGS: All fittings to match conduit material and to be suitable for the purpose intended. All fittings shall be UL Listed. Provide expansion fittings where required.

- A. EMT Fittings: Compression type "Concretight" or "Raintight." Zinc plated steel body and steel nut. Insulated throats. Setscrew fittings not permitted for 1-1/4" and larger conduits..
- B. Flexible Metal Conduit/MC Cable Fittings: 360° squeeze type. Malleable iron or cast zinc bodies. Insulated throat.

2.3 DEVICE & OUTLET BOXES: Indoor boxes - zinc-coated or cadmium plated steel, NEMA OS-1.

- A. Full-size (4" high) boxes required for all wiring devices (switches, outlets, etc.). 3"x2" switch boxes, handy boxes or other reduced-size boxes are not permitted. One-piece, zinc-coated drawn steel, NEMA OS-1.
- B. Furnished all boxes with appropriate covers. No sectionalized boxes shall be used. Provide "stud-to-stud" or "dual box to stud" mounting brackets to ensure all adjacent boxes are level. Thomas & Betts, or equal.
- C. Device boxes for surface mounting in unfinished spaces: One-piece, zinc-coated drawn steel, NEMA OS-1. Square boxes with rounded corners and no sharp, protruding edges. Knockouts on all four sides. Pre-drilled mounting holes, and ground wire screw holes. Raised device cover plates for switches or outlets, as required. T&B RS Series.
- D. Unheated, "damp" and "wet" locations and outdoor locations: NEMA 4 cast-aluminum, cast steel or cast iron. Threaded hubs for surface mounted boxes. "White metal" boxes rated NEMA 4 are not acceptable.

2.4 JUNCTION AND PULL BOXES: Dry locations: 12 gauge galvanized sheet steel minimum; flat covers secured in position by round head brass or stainless steel 300 grade machine screws; NEMA OS-1, "Sheet Steel Outlet Boxes, Covers and Box Supports." Exterior and wet locations: Cast aluminum or galvanized cast-iron type; threaded hubs; gasketed screw-on cover plates; NEMA FB-1, "Fittings, Cast Metal Boxes, and Conduit Bodies for Conduit and Cable Assemblies."

PART 3 EXECUTION

<Requires edit for each project.>

- 3.1 APPLICATION: General Conduit Applications: EMT or MC Cable for branch circuits concealed in ceilings and walls. EMT for exposed branch circuits. Greenfield for connections to lights, indoor transformers, or similar loads subject to vibration.

- 3.2 CONDUIT INSTALLATION: Install all conduit concealed, unless not possible. Minimum size (3/4) inch, unless noted otherwise. Parallel and perpendicular to walls, structural members, ceilings and interior surfaces; install plumb. Polypropylene or nylon pull line in each empty conduit. On walls below grade, use standoff brackets to maintain 1/2" space. Where conduit passes through exterior walls, floor or roof, install appropriate fittings and materials to make openings watertight.

END OF SECTION

SECTION 26 20 00
LOW VOLTAGE ELECTRICAL DISTRIBUTION

PART 1 GENERAL - Not Used.

PART 2 PRODUCTS

- 2.1 AUTOMATIC CIRCUIT BREAKERS: UL Listed, automatic circuit breakers for installation within panelboards and switchboards, or with enclosed cabinets and trim. Molded case, thermal magnetic, inverse time. Ratings as per drawings. NEMA 1 enclosure, unless noted otherwise.

PART 3 EXECUTION

- 3.1 INSTALLATION: Maintain minimum working space required access space according to manufacturer's written instructions and NEC.

END OF SECTION

SECTION 26 27 26
WIRING DEVICES

PART 1 GENERAL - Not Used.

PART 2 PRODUCTS

- 1.1 WIRING DEVICES – GENERAL: All shall meet NEMA Standard WD 1, "General Purpose Wiring Devices". UL Listed. All devices shall be of one manufacturer. All devices shall be commercial spec grade. Devices in dwelling units shall be residential grade. All receptacles in dwelling units and any areas accessible to the public, including exterior locations, shall be of tamper resistant (TR) construction.

A. Color: IVORY except as otherwise indicated or required by Code.

2.1 A/C SWITCHES

- A. Toggle Switches: Silent mechanical type rated 20 ampere, 120/277VAC. 1-piece Lexan cam and toggle. Arrow-Hart #1991 Series, Leviton #1221 Series, Pass & Seymour PS20AC series, Hubbell CS*120 series, or equal.
- B. Wall box LED Fixture Dimmer Switches: Compatible with 0-10VDC and Phase-control LED drivers. Vertical slide, preset type, 120/277VAC. Rated 600 watts for Phase-control applications; 1000 watts for 0-10V applications. Single or 3-way operation switches, as required. Separate on-off rocker switch. Acuity *Synergy* series, Hunt *Simplicity* series, Lutron, Leviton, P&S, or equal.

2.2 RECEPTACLES

- A. Receptacles: Duplex NEMA 5-20R, 120 volt, 20 amp, 3 wire, U-ground. Construction Spec-grade. Lexan or nylon body, metal yokes. Arrow Hart #5362, Leviton #5362, or equal.

2.3 DEVICE PLATES & COVERS:

- A. Single and combination types that mate and match with corresponding wiring devices.
Plate-Securing Screws: Stainless steel, galvanized or colored, to match plate finish.
Finished Spaces: Stainless steel, satin-finish, type 302, 0.04" thick.

PART 3 EXECUTION

3.1 INSTALLATION

- A. General Requirements: Install all equipment plumb and level. Install coverplates tight to surrounding surface.
- B. Rough-in: Unless noted otherwise, the following mounting heights shall be used:
- | | | |
|----|-------------------|--------------------|
| 1. | Wall receptacles: | 18" AFF to center. |
| 2. | Wall switches: | 48" AFF to center. |

END OF SECTION

SECTION 26 50 00
LIGHTING

PART 1 GENERAL

1.1 WARRANTY

- A. Special Warranty: Extended product warranty over and above that required by the Contract and General Conditions of this contract.
- | | | |
|----|-----------------------------------|----------|
| 1. | LED Fixtures (complete assembly): | 3 years. |
| 2. | Occupancy sensors & switches: | 5 years |
| 3. | Digital and low voltage switches: | 5 years |

PART 2 PRODUCTS

2.1 CONSTRUCTION FEATURES

- A. LED Fixtures: LED source shielded from direct view. Thermal control to ensure cool running LED's. All LED's shall have a similar color temperature (degree K) rating. Replaceable LED module and driver. All LED fixtures, modules and drivers shall be RoHS compliant.

2.2 LED MODULES & DRIVERS

- A. U.L. Listed. High Efficiency, solid state drivers. Minimum rated life of 50000 hours at 70%. 3500K color temperature, unless otherwise noted or specified. CRI of 80 (minimum). RoHS compliant. Dimmable and compatible with all 0-10V dimming switches. Philips Xitanium drivers, or approved equal.
- B. Construction Features: 50/60 Hz input source of 120V-277V +/- 10% (voltage) with no damage to the Driver. Minimum input Power Factor > 0.90. Input current Total Harmonic Distortion (THD) < 20%. Class A sound rating. Minimum operating temperature of -4°F (indoor) and -40°F (outdoor). UL Listed for Damp and Dry locations. Integral common mode and differential mode surge protection of 2.5kV (100kHz 30ohm ring wave). Meets NEMA 410 for in-rush current limits. Underwriters Laboratories (UL) recognized Class 2 per UL1310. 5-year limited warranty against defects in material or workmanship, including replacement. Dimmable drivers shall be controlled by a Class 2 low voltage 0-10VDC controller with dimming range controlled between 1 and 8VDC with source current 150μA.
- C. Tested in accordance with LM-80. U.L. Listed. High Efficiency, solid state driver. Minimum rated life of 50000 hours at 70%. 3500K color temperature. CRI of 80 (minimum). Dimmable and compatible with all 0-10V dimming switches. Philips Xitanium drivers, or approved equal.

2.3 LINE/LOW VOLTAGE OCCUPANCY SENSORS

- A. Color: IVORY except as otherwise indicated or required by Code.
- B. Sensor requirements: 24v, 120V or 277V operation, as applicable. Sensitivity adjustment with LED for calibration. 5 year warranty from manufacturer. Adjustable sensitivity and time delay settings. Manual-On control of load(s) per IECC requirements.

- C. Wall Switch PIR Sensor: Passive infrared. 180° coverage. Coverage: 900 sq. ft. maximum, 300 sq. ft. for desktop activity. Maximum load 800W @ 120V, 1200W @ 277V. 2 level, 36 segment fresnel lens. Two independent pushbuttons for control of dual loads, 2 level switching, etc, where indicated. Field adjustable for Manual-On operation to meet IECC requirements. WattStopper PW-100 (single circuit) or PW-200 (dual circuit) series.
- D. Wall 0-10V Dimmer Switch PIR Sensor: Passive infrared. 180° coverage. Coverage: 1000 sq. ft. maximum. Maximum load; 1000W. 2 level, 36 segment fresnel lens. 0-10VDC dimming control. Button(s) for Manual-On of load(s) per IECC. Individual buttons for ON/OFF and UP/DOWN dimming control. Wattstopper PW-311, Hubbell, or approved equal.

PART 3 EXECUTION

3.1 BALLAST & LAMP DISPOSAL

- A. General: Provide for the proper removal and disposal of all fluorescent ballasts and lamps removed with or from the existing lighting fixtures.

3.2 INSTALLATION

- A. Fixture installation - General: Support fixtures independent of ceiling systems, ducts and piping. Provide hangers from purlins, joists, beams, etc. Galvanized steel for all hangers, channels, bolts, etc. Maintain required clearances around fixtures per manufacturer.

END OF SECTION

SECTION 27 05 26 GROUNDING AND BONDING FOR COMMUNICATIONS SYSTEMS

1.1 GENERAL

1.2 SUMMARY

A. Section Includes:

1. Grounding/Earthing and bonding for Low Voltage systems such as telecommunications and audiovisual systems.
2. Primary Bonding Busbar (PBB)
3. Secondary Bonding Busbar (SBB)
4. Telecommunications Bonding Backbone (TBB)
5. Backbone Bonding Conductor (BBC)
6. Rack Bonding Busbar (RBB)
7. Telecommunications Equipment Bonding Conductor (TEBC)
8. Telecommunications bonding conductor (TBC)
9. Pathways.

B. Related Sections:

1. Division 26 Section *Grounding and Bonding* for building systems with which to interface with Work of this Section.

1.3 DEFINITIONS

- A. AFC: Above Finished Ceiling
- B. BICSI: Building Industry Consulting Service International.
- C. Bonding: Permanent joining of metallic parts to form an electrically conductive path to ensure electrical continuity and capacity to safely conduct current.
- D. Common Bonding Network (CBN) – The principal means for affecting bonding and earthing inside a building.
- E. Cross-Connect: A facility enabling the termination of cable elements and their interconnection or cross-connection.
- F. EMI: Electromagnetic interference.

- G. Ground/Earth – A conducting connection, whether intentional or incidental, by which an electric circuit or equipment is connected to ground, or to some conducting body of relatively large extent that serves in place of the ground.
- H. HC: Horizontal Cross Connect
- I. IDC: Insulation displacement connector.
- J. LAN: Local Area Network.
- K. MC: Main Cross-connect
- L. NEBS: Network Equipment Building System.
 - 1. NEBS Level 3: Equipment complies with strict specifications for fire suppression, thermal margin testing, vibration resistance including seismic, airflow patterns, acoustic limits, failover and partial operational requirements such as chassis fan failures, failure severity levels, RF emissions and tolerances, and testing/certification requirements.
- M. NEC: National Electric Code
- N. RCDD: Registered Communications Distribution Designer.
- O. TR: Telecommunications Room
- P. UTP: Unshielded twisted pair.

1.4 SYSTEM DESCRIPTION

- A. Provide a complete and functioning Telecommunications grounding/earthing system inclusive of all hardware, software and training to meet or exceed the performance features outlined in this document.
- B. Purpose: Telecommunications grounding/earthing system creates a low impedance path to earth ground to prevent damage to equipment and disruption in service due to electrical surges and transient voltages.
- C. Grounding/earthing system comply with following:
 - 1. NEC and local electrical codes
 - 2. ANSI/TIA-607-D or latest version.
 - 3. ISO/IEC 30129
 - 4. IEEE 1100
- D. Secondary Bonding Busbar (SBB): Ground/earth each telecommunications space to the Primary Bonding Busbar (PBB) located at the telecommunications entrance room.

1.5 SUBMITTALS

- A. Comply with Division 01330 Section *Submittal Procedures*.
- B. Submittal data is to be submitted electronically. Each submittal shall contain the below in the following order:
 - 1. Cover Sheet.
 - a. Include name of supplying contractor and project name.
 - 2. Detailed Bill of Materials.
 - a. Include a listing of: component quantities, equipment manufacturer, model number, and description of each component being supplied, and the specification paragraph or drawing sheet that corresponds to the product. Failure to provide this information will result in the rejection of submittals.
 - 3. Product Data.
 - a. Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product. Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures. If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight.
- C. Shop Drawings
 - 1. Wiring diagram to show grounding schematics, including the following: Busbars and bonding backbone. Detail mounting assemblies and show elevations and physical relationship between the installed components.
 - 2. Show the relationship of TR's, the pathway between them, and cable connectivity to be installed.
 - 3. Drawings should be at project standard scale clearly legible.

1.6 QUALITY ASSURANCE

- A. Regulatory Requirements, grounding/earthing and bonding systems:
 - 1. TIA/EIA
 - a. TIA-942 Telecommunications Infrastructure Standard for Data Centers
 - b. J-STD-607-D Commercial Building Grounding/Bonding Requirements
 - c. TIA/EIA-606 Administration Standard for the Telecommunications Infrastructure of Commercial Buildings
 - 2. IEEE

- a. Std 1100 IEEE Recommend Practice for Powering and Grounding Electronic Equipment (IEEE Emerald Book)
- 3. Telcordia:
 - a. NEBS 3 as defined for RBOC-CO compliance.
- 4. NFPA
 - a. NFPA-70 National Electric Code (NEC)
- B. Testing Procedures:
 - 1. NEBS GR-63-CORE: Network Equipment-Building System Requirements: Physical Protection.
 - 2. NEBS GR-1089-CORE: Electromagnetic Compatibility and Electrical Safety -- Generic Criteria for Network Telecommunications Equipment

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers, Grounding/Earthing Systems:
 - 1. Panduit
 - 2. Chatsworth
 - 3. Harger
 - 4. Burndy
 - 5. Ortronics/Legrand
 - 6. Erico
- B. Acceptable Manufacturers, Telecommunications Bonding Busbars:
 - 1. Panduit
 - 2. Chatsworth
 - 3. Harger
 - 4. Burndy
 - 5. Ortronics/Legrand
 - 6. Erico

C. Acceptable Manufacturers, Rack Bonding Kits:

1. Panduit
2. Chatsworth
3. Harger
4. Burndy
5. Ortronics/Legrand
6. Erico

2.2 GROUNDING/EARTHING AND BONDING

A. General:

1. Conductors: Provide copper grounding/earthing conductors.
2. Lugs, grounding strips, and busbars: UL Listed.
3. Fabricate with premium quality tin-plated electrolytic copper, providing low electrical resistance while inhibiting corrosion.
4. Provide antioxidant for field- bonding connections.
5. Lugs: NEBS Level 3. Provide two-hole lugs with irreversible compression and inspection windows, certified for use in non-corrosive environments so that connections may be inspected for full conductor insertion.
6. Die index numbers: Embossed on compression connections to allow crimp inspection.
7. Cable assemblies: UL Listed and CSA Certified.
 - a. Cables: Green or green/yellow.
 - b. Jackets: UL Listed, VW-1 flame rated.

- B. Telecommunications Bonding Backbone (TBB): A cable used to ground/earth PBB. Connect PBB to SBB; comply with J-STD-607-D guidelines and provide gauge not lighter than the following:

Table 1 – TBB/BBC/TBC conductor size vs length	
TBB Length in Linear meters (feet)	TBB Size (AWG)
Less than 4 (13)	6
4 - 6 (14 - 200)	4
6 - 8 (21 - 26)	3
8 - 10 (27 - 33)	2

10 - 13 (34 - 41)	1
13 - 16 (42 - 52)	1/0
16 - 20 (53 - 66)	2/0
20 - 26 (67-84)	3/0
26 - 32 (85 - 105)	4/0
32 - 38 (106 - 125)	250 kcmil
38 -46 (126 - 150)	300 kcmil
46 - 53 (151 - 175)	350 kcmil
53 - 76 (176 - 250)	500 kcmil
76 - 91 (251 - 300)	600 kcmil
Greater than 91 (301)	750 kcmil

C. Sizing the Telecommunications Bonding Conductor (TBC)

1. The TBC shall be, as a minimum, the same size as the largest TBB.

D. Sizing the Backbone Bonding Conductor (BBC)

1. The BBC shall be, as a minimum, the same size as the largest TBB to which it is connected.

E. Structural metal

1. The bonding conductor from the structural metal to the PBB or SBB shall be sized according to Table 1. Additionally, this conductor should be no smaller than any conductor that comprises the telecommunications bonding backbone system. Bonds to structural metal shall be made using listed exothermic welding, listed compression connections, or listed mechanical connectors and shall be accessible.

F. Telecommunications Equipment Bonding Conductor (TEBC): A cable used from the PBB or SBB to Rack and Rack Bonding Busbar (RBB) – minimum Size 6AWG.

G. Bonding Cable, Typical: For applications other than TBB, TEBC and BBC, provide gauge not lighter than the following:

Table 2- Cable Sizes for Other Grounding/Earthing Applications	
Purpose	Copper Code Cable Size
Aisle grounds (overhead or under floor) of the common bonding network	#2 AWG or larger (1/0 preferred)
Bonding conductor to each PDU or panel board serving the room.	Size per NEC 250.122 & manufacturer recommendations
Bonding conductor to HVAC equipment	6 AWG
Building columns	4 AWG
Cable ladders and trays	6 AWG
Conduit, water pipe, duct	6 AWG

2.3 COMPONENTS, KITS AND HARDWARE

- A. Provide BICSI/J-STD-607-D telecommunications Primary Bonding Busbar PBB. Locate PBB at the telecommunications entrance room.
- B. Provide BICSI/J-STD-607-D Telecommunications Bonding Conductor (TBC) from the telecommunications entrance room to the AC service entrance. Bonds to AC service entrance shall be made using listed exothermic welding, listed compression connections, or listed mechanical connectors and shall be accessible.
- C. Provide BICSI/J-STD-607-D telecommunications Secondary Bonding Busbar (SBB) at typical telecommunications/equipment spaces throughout the building.
 - 1. Provide additional SBB's as needed for number of termination points within each telecommunications/equipment space or upsize the SBB to a PBB.
 - 2. Multiple SBB's within a room shall be bonded together with a conductor the same size as the TBB or with splice bars.
- D. Provide BICSI/J-STD-607-D telecommunications Rack Bonding Busbar (RBB) at rack and cabinet locations.
- E. Provide compression type two-hole lugs for connecting conductors to PBB, SBB and RBB.

PART 3 - EXECUTION

3.1 ROUTING TBB, TBC AND SBB

- A. Route the TBB to each SBB in as straight a path as possible. The TBB should be installed as a continuous conductor, avoiding splices where possible. When more than one TBB is used, bond them together on the top floor and every third floor in-between with a conductor known as a Backbone Bonding Conductor (BBC). When sizing the BBC, it must be at least the same size as the largest TBB.
- B. Bend The inside bend radius of telecommunications bonding conductors terminated at the primary bonding busbar (PBB) or secondary bonding busbar (SBB) shall have an inside bend radius of 200 mm (8 in). At other locations, bends in the bonding conductors should be limited to the greatest practical inside bend radius with a minimum bend radius of 10 times the bonding conductor diameter recommended. In all cases, the minimum bend radius angle shall be 90° or greater.
- C. Avoid routing grounding/earthing conductors in metal conduits. If the grounding/earthing conductor must be routed through a metal conduit, bond each end of the conduit to the grounding/earthing conductor. Use grounding clamps to bond to the conduit and #6 AWG copper conductor to connect the grounding clamp to the TBB.

3.2 RACK GROUNDING/EARTHING

- A. Bonding Equipment and Racks: Comply with BICSI/J-STD-607-D.

- B. To provide electrical continuity between rack elements, use paint piercing grounding washers where rack sections bolt together, on both sides, under the head of the bolt, and between the nut and rack.
- C. Utilize full-length rack ground strips attached to the rear of the side rail with thread-forming screws provided to ensure metal-to-metal contact.
- D. Mount an electrostatic discharge (ESD) port kit, directly to the Rack Bonding Busbar. Mount a second electrostatic discharge (ESD) port kit directly to the vertical mounting rail of the rack in the front at approximately the same height. Use the thread-forming screws provided to form a bond to the rack.
- E. When the equipment manufacturer provides a location for mounting a grounding connection, that connection shall be utilized. Use the appropriate jumper for the equipment being installed and the thread-forming screws provided in the kit.
- F. Do not bond racks or cabinets serially.
- G. Bond patch panels to racks using bonding screws.
- H. Patch panels for shielded cabling shall be bonded to the telecommunications bonding system in accordance with manufacturer instructions

3.3 TESTING

- A. Perform continuity testing measurements of the grounding system with resistance to not exceed 0.1 ohm between:
 - 1. The PBB and the nearest grounding electrode.
 - 2. Each SBB and the nearest grounding electrode.
 - 3. Each SBB and pathway(s), rack(s), cabinet(s), and applicable equipment.

3.4 GROUNDING SYSTEM

- A. Communications grounding system: Comply with ANSI/TIA-942 and ANSI/TIA-607-D.
- B. Connection to Building ground/earth: Ensure connection is made by a licensed, electrical Installer, including installation and termination of the main bonding conductor to the building service entrance ground.
- C. Bond PBB to building steel; ground/earth to electrical service ground. Comply with BICSI TDM Manual and ANSI/TIA-607-D guidelines.
- D. Utilize UL listed exothermic two-hole lugs to make connections to the primary bonding busbar (PBB).

END OF SECTION 27 05 26

SECTION 27 05 28 TELECOMMUNICATIONS CABLING INFRASTRUCTURE

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 REFERENCES

- A. Building Industry Consulting Services International (BICSI), "Telecommunications Distributions Methods Manual," Fourteenth Edition
- B. ANSI/TIA-569-E, "Commercial Building Standard for Telecommunications Pathways and Spaces"
- C. ANSI/TIA-606-C, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings"
- D. ANSI/TIA-607-D, "Commercial Building Grounding/Bonding Requirements"
- E. National Electrical Code (NEC), 2020 - National Fire Protection Agency (NFPA) 70

1.3 SUMMARY

A. Section Includes:

1. Cable management system.
2. Cabling identification products.
3. Backboards.
4. Telecommunications equipment racks and cabinets.
5. Telecommunications service entrance pathways.
6. Grounding.
7. Pathways.
8. Telecommunications mounting elements.
9. Multiuser telecommunications outlet assemblies.

B. Related Sections:

1. Division 27 05 26 "Grounding and Bonding for Communications Systems "for grounding conductors and connectors.

C. Bidding Requirements:

1. Bidder shall submit complete detailed proposals with line item cost representation for components and associated installation labor. Lump sum bids will not be accepted.
2. Bidders shall include as part of the bid response the following items:
 - a. Installation schedule with proposed manpower assignments,
 - b. Resumes for project manager and lead technician for this project.
3. Unspecified Equipment and Material: Any item of equipment or material not specifically addressed on the drawings or in this document and required to provide complete and functional Structured Cabling System shall be provided in a level of quality consistent with other specified items.

1.4 DEFINITIONS

- A. AFC: Above Finished Ceiling Riser:
- B. BICSI: Building Industry Consulting Service International.
- C. EF: Entrance Facility
- D. EMI: Electromagnetic interference.
- E. HC: Horizontal Cross Connect
- F. IDC: Insulation displacement connector.
- G. Ladder Cable Tray: A fabricated structure consisting of two longitudinal side rails connected by individual transverse members (rungs).
- H. LAN: Local Area Network.
- I. MC: Main Cross-connect
- J. NRTL: Nationally Recognized Testing Laboratory
- K. Outlet/Connectors: A connecting device in the work area on which horizontal cable or outlet cable terminates.
- L. RCDD: Registered Communications Distribution Designer.
- M. TR: Telecommunications Room

1.5 SYSTEM DESCRIPTION

- A. Provide a complete and functioning Structured Cabling System infrastructure inclusive of all hardware to meet or exceed the performance features outlined in this document.
- B. A work area is approximately 100 sq. ft. and includes the components that extend from the telecommunications outlet/connectors to the station equipment.

- C. Communications equipment room shall provide the space to house the equipment for the backbone and horizontal cabling.

1.6 SUBMITTALS

- a. Cover Sheet
 - 1) Include name of supplying contractor and project name.
 - 2) Include submittal and revision number.
 - b. Detailed Bill of Materials
 - 1) Include a listing of component quantities, equipment manufacturers, model numbers, and descriptions of each component being supplied and the specification paragraphs or drawing sheets that correspond to each product.
 - 2) The bill of materials shall include page numbers for each product data sheet and be index referenced within the PDF file so that each product name is clickable, linked to the first page of the corresponding product data.
 - 3) Failure to provide this information will result in the rejection of submittals.
 - c. Product Data
 - 1) Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product.
 - 2) Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures.
 - 3) If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight.
 - d. Prequalification Certificate
 - 1) Copy of the installing technician(s) certificate of completion from the manufacturer's training school for the equipment being provided.
 - e. Submittal shall be a single PDF file.
 - 1) Partial submittals, or submittals comprised of multiple PDF files, will be rejected.
- B. Shop Drawings are to be submitted on project standard full size and bound. Each shop drawing set is to include the below in the following order:
- 1. Title Sheet.
 - a. Containing, at a minimum, a list of all drawings in the set and a symbols legend defining each symbol used in the package.
 - 1. Telecommunications Room Details.
 - a. Plan Details of infrastructure and room fittings with clearances, Elevation details of wall fields and rack details.

1.7 QUALITY ASSURANCE

- A. Installer Qualifications: Cabling Installer must have personnel certified by BICSI on staff.
- 1. Layout Responsibility: Preparation of Shop Drawings and Cabling Administration Drawings by an RCDD.
 - 2. Installation Supervision: Installation shall be under the direct supervision of Level 2 Installer and manufactures certified installer, who shall be present at all times when Work of this Section is performed at Project site. One half of remainder of the crew shall be at a

minimum Registered Technicians by manufacture as part of their Certified Installer Program.

- B. 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.
- C. Telecommunications Pathways and Spaces: Comply with ANSI/TIA-569-E.
- D. Administration Standard for the Telecommunications Infrastructure of Commercial Buildings, 2017 ANSI/ANSI/TIA-606-C.
- E. Grounding: Comply with ANSI-J-STD-607-D.
- F. NFPA 70 – National Electric Code, latest edition
- G. BICSI – Telecommunications Distribution Methods Manual, Fourteenth Edition
- H. NEMA – VE-1 – Metal Cable Tray Systems, 2017
- I. NEMA – VE-2 – Metal Cable Tray Installation Guidelines, 2013

1.8 PROJECT CONDITIONS

- A. Environmental Limitations: Do not deliver or install equipment frames and ladder racking until spaces are enclosed and weathertight, wet work in spaces is complete and dry, and work above ceilings is complete.

1.9 COORDINATION

- A. Coordinate layout and installation of communications equipment with Owner's telecommunications and LAN equipment and service suppliers.
 - 1. Meet jointly with telecommunications and LAN equipment suppliers, local exchange carrier representatives, and Owner to exchange information and agree on details of equipment arrangements and installation interfaces.
 - 2. Record agreements reached in meetings and distribute them to other participants.
 - 3. Adjust arrangements and locations of distribution frames, cross-connects, and patch panels in equipment rooms to accommodate and optimize arrangement and space requirements of telephone switch and LAN equipment.
 - 4. Adjust arrangements and locations of equipment with distribution frames, cross-connects, and patch panels of cabling systems of other communications, electronic safety and security, and related systems that share space in the equipment room.
- B. Coordinate layout and installation of telecommunications pathways and cabling with Owner's telecommunications and LAN equipment and service suppliers.
- C. Coordinate telecommunications outlet/connector locations with location of power receptacles at each work area.

- D. Coordinate location of power raceways and receptacles with locations of communications equipment requiring electrical power to operate.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selection:
 - 1. Manufacturers: Subject to compliance with requirements, provide products by the manufacturers specified.

2.2 PATHWAYS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following available manufacturers offering products that may be incorporated into the Work include, and are limited to, the following:
 - 1. Basis of design: nVent Caddy
 - 2. Approved equals by:
 - a. Eaton/B-line
 - b. Hilti Inc.
- B. General Requirements: Comply with TIA/EIA-569-E.
- C. Cable Support: NRTL labeled. Cable support brackets in Telecommunications Rooms shall be designed to prevent degradation of cable performance and pinch points that could damage cable.
- D. Provide bend limiters, if not built into the cable support, to maintain cable type bend radius whenever cable exists pathways or makes transition between two pathways.
- E. Non-continuous cable supports shall be used in any area above the finished ceiling where cable tray is not available.
- F. Adjustable non-continuous cable support slings shall be used in corridors as outlined on "TA"
- G. Non-continuous cable supports
 - 1. Cable Support: NRTL labeled for support of Category 6 cabling, designed to prevent degradation of cable performance and pinch points that could damage cable.
 - 2. Non-continuous cable supports shall provide a bearing surface of sufficient width to comply with required bend radii of high-performance cables; cULus Listed.
 - 3. Non-continuous cable supports shall have flared edges to prevent damage while installing cables.

4. Non-continuous cable supports sized 1 5/16" and larger shall have a cable retainer strap to provide containment of cables within the hanger. The cable retainer strap shall be removable and reusable and be suitable for use in air handling spaces.
 5. Non-continuous cable supports shall have an electro-galvanized or G60 finish and shall be rated for indoor use in non-corrosive environments.
 6. Non-continuous cable supports shall be ERICO CableCat™ J-hook series CAT12, CAT21, CAT32, CAT64, CAT21SS, CAT32SS, CAT64SS; CAT-CMTM Double J-Hook CAT100CM; CAT-CMTM U-hook series CAT200CMLN, CAT300CMLN; and CAT-CMTM retainer CATRT200CM, CATRT300CM or approved equal.
- H. Adjustable non-continuous cable support sling
1. Constructed from steel and woven laminate; sling length can be adjusted to hold up to 425 4-pair UTP; rated for indoor use in non-corrosive environments. Rated to support Category 5 and higher cable, or optical fiber cable; cULus Listed.
 2. Adjustable non-continuous cable support sling shall have a static load limit of 100 lbs.
 3. Adjustable non-continuous cable support sling shall be suitable for use in air handling spaces.
 4. If required, assemble to manufacturer recommended specialty fasteners including beam clips, flange clips, C and Z purlin clips.
 5. Acceptable products: ERICO CADDY CableCat™ CAT425; or approved equal.
- I. Non-continuous cable support assemblies from drop wire/ceiling
1. Fastener to wire/rod with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
 2. Acceptable products: ERICO CADDY CAT124Z34, CAT126Z34, CAT214Z34, CAT216Z34, CAT324Z34 or CAT326Z34; or approved equal.
- J. Non-continuous cable support assemblies from beam, flange
1. Fastener to beam or flange with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments; cULus Listed.
 2. Acceptable products: ERICO CableCat™ J-hook series CAT12, CAT21, CAT32, CAT64 with CADDY beam clamps and CADDY flange clips; or approved equal.
- K. Non-continuous cable support assemblies from C & Z Purlin
1. Fastener to C or Z purlin with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments, cULus listed.
 2. Acceptable products: ERICO CableCat™ J-hook series CAT12, CAT21, CAT32, CAT64 with CADDY Purlin hangers; or approved equal.

L. Non-continuous cable support assemblies from wall, concrete, or joist

1. Fastener to wall, concrete, or joist with one non-continuous cable support, factory or jobsite assembled; rated for indoor use in non-corrosive environments, cULus listed.
2. Acceptable products: ERICO CableCat™ J-hook series CAT12, CAT21, CAT32, CAT64, with CADDY angle bracket; or approved equal.

M. Non-continuous cable support assemblies from threaded rod

1. Fastener to threaded rod with one non-continuous cable support, factory or jobsite assembled, rated for indoor use in non-corrosive environments, cULus Listed.
2. The multi-tiered support bracket shall have a static load limit of 300 lbs.
3. U-hooks and Double J-hook shall attach directly to threaded rod using standard nuts.
4. Acceptable products: ERICO CableCat™ J-hook, CAT12, CAT21, CAT32, CAT64 with CADDY CATHBA series; CAT-CMTM Double J-hook CAT100CM, CAT-CMTM Direct mount U-hook CAT200CMLN, CAT300CMLN; or AFAB series; or approved equal.

N. Raised floor non-continuous cable support assemblies

1. Fastener to raised (access) floor pedestal with one non-continuous cable support, factory or jobsite assembled, rated for indoor use in non-corrosive environments; cULus Listed.
2. Acceptable products: ERICO CADDY CAT12CD1B, CAT21CD1B or CAT32CD1B; CAT64CD1B; or approved equal.

O. Cantilever-Mounted cable supports

1. U-hook shall be able to be assembled to a wide variety of wall mount brackets.
2. Spacing of individual U-hooks as needed, max of 4' to 5' apart.
3. U-hooks may have the optional attachment of a cable roller for ease in pulling cables.
4. Acceptable products: ERICO CAT-CMTM U-hooks CAT200CMLN, CAT300CMLN: CAT-CM roller assemblies CATRL200CM, CATRL300CM; CATWMCM bracket; or approved equal.

2.3 METAL CONDUIT AND TUBING

A. Manufacturers:

1. AFC Cable Systems, Inc.
2. Alflec Inc.
3. Anamet Electrical, Inc.; Anaconda Metal House.
4. Electri-Flex Co.

- 5. Grinnell Co./Tyco International; Allied Tube and Conduit Div.
- 6. O-Z Gedney; Unit of General Signal.
- 7. Wheatland Tube Co.
- B. Rigid Steel Conduit: ANSI C80.1.
- C. IMC: ANSI C80.6.
- D. EMT and Fittings: ANSI 80.3.
 - 1. Fittings: Set-screw or compression type.
- E. FMC: Zinc-coated steel.
- F. LFMC: Flexible steel conduit with PVC jacket.
- G. Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.4 METAL WIREWAYS

- A. Manufacturers:
 - 1. Hoffman.
 - 2. Square D.
- B. Material and Construction: Sheet metal sized and shaped as indicated, NEMA 1 for interior & NEMA 4 for exterior.
- C. Fittings and Accessories: include couplings, offsets, elbows, expansion joints, adapters, hold-down straps, end caps, and other fittings to match and mate with wireways as required for complete system.
- D. Select features, unless otherwise indicated, as required to complete wiring system and to comply with NFPA 70.
- E. Wireway Covers: Flanged-and-gasketed type or As indicate.
- F. Finish: Manufacturer's standard enamel finish.

2.5 SURFACE RACEWAYS

- A. Surface Metal Raceways: Galvanized steel with snap-on covers. Finish with manufacturer's standard prime coating.
- B. Manufacturers:
 - 1. Airey-Thompson Sentinel Lightning; Wiremold Company (The).
 - 2. Thomas & Betts Corporation.

3. Walker Systems, Inc.; Wiremold Company (The).
4. Wiremold Company (The); Electrical Sales Division.
- C. Types, sizes, and channels as indicated and required for each application, with fittings that match and mate with raceways.

2.6 BOXES, ENCLOSURES, AND CABINETS

A. Manufacturers:

1. Cooper Crouse-Hinds; Div. Of Cooper Industries, Inc.
2. Emerson/General Signal; Appleton Electric Company.
3. Hoffman.
4. Hubbell, Inc.; Killark Electric Manufacturing Co.
5. O-Z/Gedney; Unit of General Signal
6. RACO; Division of Hubbell, Inc.
7. Robroy Industries, Inc.; Enclosure Division.
8. Spring City Electrical Manufacturing Co.
9. Thomas & Betts Corporation.
10. Walker Systems, Inc.; Wiremold Company (The)

B. Sheet Metal Outlet and Device Boxes: NEMA OS 1.

C. Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

D. Floor Boxes: Cast metal, fully adjustable, rectangular.

E. Small sheet Metal Pull and Junction Boxes: NEMA OS 1.

F. Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

G. Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

H. Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

I. Cabinets: NEMA 250, Type 1, galvanized steel box with removable interior panel and removable front, finished inside and out with manufacturer's standard enamel. Hinged door in front cover with flush latch and concealed hinge. Key latch to match panelboards. Include metal barriers to separate wiring of different systems and voltage and include accessory feet where required for freestanding equipment.

J. FACTORY FINISHES

1. Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard paint applied to factory assembled surface raceways, enclosures, and cabinet before shipping.

2.7 FIRE STOP CABLE PASS-THRU SLEEVES

- A. Manufacturers: Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:
 1. Basis of design: Specified Technologies Inc.
 2. Approved equal by:
 - a. 3M Corporation
 - b. Hilti Corporation
 - c. Wiremold- Legrand Corporation
- B. Fire Rated Cable Pathways: STI EZ-PATH Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill, the following products are acceptable:
 1. Specified Technologies Inc. (STI) EZ-PATH Series 44 Fire Rated Pathway
 2. Specified Technologies Inc. (STI) EZ-PATH Series 33 Fire Rated Pathway
- C. Fire stop sleeves located in the floor of each TR shall be quantity as shown on contract drawings STI EZ-path MAX Series 44 cast in concrete.
- D. Horizontal cable pathway locations shall be quantity as shown on contract drawings.

2.8 FIRE STOP CABLE MODULAR FLOOR GRID SYSTEM

- A. Manufacturers: Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:
 1. Basis of design: Specified Technologies Inc.
 2. Approved equal by:
 - a. Hilti Corporation
 - b. 3M Corporation
- B. Fire stop sleeves located in the floor of TR's shall be STI EZ PATH Series 44 Modular Grid System quantities as shown on contract drawings.
 1. Product EZDG444 single slot grid complete with EZ-PATH Series 44 modules.
 2. Product EZG844 with EZD444MB pathway modules.
 3. Product EZG1644 with EZD444MB pathway modules.

2.9 NON-RATED CABLE PASS-THRU SLEEVES

- A. Manufacturers: Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:
1. Basis of design: Specified Technologies Inc.
 2. Approved equal by:
 - a. 3M Corporation
 - b. Hilti Corporation
 - c. Wiremold- Legrand Corporation
- B. Non-Rated Cable Pathways: STI EZ-PATH Brand device modules The smoke and acoustical pathway shall contain a built-in sealing system and shall automatically adjust to the installed cable loading and shall permit cables to be installed, removed, or retrofitted without the need to remove or reinstall acoustical materials. The following products are acceptable:
1. Specified Technologies Inc. (STI) EZ Path® Series 44 NEZ Smoke and Acoustical Pathway
 2. Specified Technologies Inc. (STI) EZ Path® Series 33 NEZ Smoke and Acoustical Pathway
 3. SpecSeal® Smoke 'N' Sound Smoke and Acoustical Sealant
 - a. SNS120W 20 Oz Sausage - 36 cu in (592 ml)
 - b. SNS129W 730573111529 29 Oz Tube - 52 cu in (858 ml)
 - c. SNS105W 730573111543 5 Gallon Pail - 1,155 cu in (19.0 L) (White)
- C. Horizontal cable pathway locations greater than 20 cables fire stop sleeves shall be STI EZ-Path series 33 or 44 as needed for pathway cable capacity
- D. Horizontal cable pathway locations fewer than 20 cables EMT sleeve with mineral or ceramic fiber stuffing insulation and smoke/acoustical Sealant.
- E. Fill ratio for fire stop EMT sleeves shall not exceed 20% fill capacity.

2.10 GROUNDING

- A. Comply with requirements in Division 27 05 26 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.
- B. Comply with ANSI-J-STD-607-D.

2.11 LADDER RACK, SUPPORTS, AND ACCESSORIES

- A. Ladder Rack (Universal Cable Runway)
1. Ladder rack shall be manufactured from 3/8" wide by 1-1/2" high tubular steel with .065" wall thickness.
 2. Ladder rack (side stringers) will be 9'-11 1/2" long. Cross members will be welded in between stringers on 12" centers beginning 5-3/4" from one end so that there are 10 cross members per ladder rack. There will be 10-1/2" of open space in between each cross member.
 3. Ladder rack will be delivered individually boxed, and available in the multiple widths.

4. Finish shall be epoxy-polyester hybrid powder coat (paint) black in color.
5. Design Make: Chatsworths Products, Inc. (CPI), Universal Cable Runway: Part Number 10250-712, Universal Cable Runway, 12" Wide, Black 10250-718, Universal Cable Runway, 18" Wide, Black or approved equal.
6. Design Make: Chatsworths Products, Inc. (CPI), Universal Cable Runway: Part Number 10250-724, Universal Cable Runway, 24" Wide, Black placed in vertical positions or approved equal.

B. Ladder Rack Splices

1. Splice kits will provide a method of mechanically connecting ladder rack sections and turns together end-to-end or side-to-end to form a continuous pathway for cables.
2. Grounding kits will provide a method of bonding ladder rack sections and turns together that is independent of the pathway splices. The grounding kit should be constructed of UL Listed components. The preferred solution is a #6 AWG green insulated stranded copper conductor connected on both ends to ladder rack using two-hole compression lugs and stainless steel hardware.
3. Splices (splice plates) will be manufactured from steel. Splice, grounding and insulator bar kits will include installation hardware.
4. Finish (of splice plates and hardware) shall be zinc plate in the color(s) specified below. Colors are applied as a chem. film over the zinc plate.
5. Design Make: Chatsworths Products, Inc. (CPI), Cable Runway Splices or approved equal.

C. Ladder Rack Supports

1. Supports will be sized to match the width of the ladder rack that is supported. Some supports will work with all widths of ladder rack.
2. Each support will include a means of securing ladder rack to the support.
3. Supports will be manufactured from steel or aluminum.
4. Finish shall be epoxy-polyester hybrid powder coat (paint) in the color(s) specified below or zinc plate with a gold chem. finish specified gold. Included hardware shall be zinc plated with a gold chem. finish.
5. Design Make: Chatsworths Products, Inc. (CPI), Cable Runway Supports or approved equal.

D. Ladder Rack Accessories

1. Cable straps used for attaching cable bundles to the ladder rack cross members must be reusable with a hook and loop-style closure, at least ¾" wide, and sized for cable bundles that are 2", 3" or 4" in diameter.

2. Cable retaining posts used to keep cable from falling off of the side of the ladder rack shall be manufactured from 1" by ½" tubular steel with .065" wall thickness. Cable retaining posts will be 8" high and will attach to the side stringer of the ladder rack with included hardware. The top of the cable retaining posts will be fitted with a rubberized end cap to protect cables.
3. End caps used to cover the ends of ladder rack will be manufactured from a black fire-retardant rubberized material. End caps will be sized for 3/8" wide by 1-1/2" high side stringers and will be sold in pairs.
4. End closing kits used to cover the end of ladder rack will be manufactured from 3/8" wide by 1-1/2" high tubular steel with .065" wall thickness. Kits will consist of a bar cut to match the width of the ladder rack and the hardware required to attach the bar to the end of a length of ladder rack.
5. Radius drops used to create a radius to form cables over as the cables exit or enter the ladder rack will be manufactured from aluminum extrusion. The extrusion will be formed in a 90° arc with a minimum bend radius of 3". Radius drops will attach to either the side stringer or the cross member of the ladder rack using a clevis pin. Radius drops will include 1-1/2" high cable spools that attach to the top of the radius drop to guide cables.
6. Movable cross members used to support cross member radius drops in between welded cross members on ladder rack will be manufactured from 3/8" by 1-1/2" aluminum bar. Movable cross members will attach to ladder rack at the side stringers with included hardware so that the location of the movable cross member can be adjusted. Moveable cross member will support a cross member radius drop.
7. Cable spools used to separate ladder rack into multiple cable pathways will be made from a black flame retardant ABS. Cable spools will attach to the cross members with a clip that allows the width of the ladder rack to be divided into any proportion. The spools will be 3.94" tall, with a 1.94" diameter top, and a body that tapers from .88" (diameter) at the top to .62" (diameter) at the bottom.
8. Auxiliary support brackets used to support cables that should be physically separated from the cables in the ladder rack will be made from 1/8" x 1" steel bar. The bracket will be L-shaped and will attach to the side stringer of the ladder rack. The bracket will hang below the ladder rack a minimum of 4". The bracket support surface will be 4" long. The bracket will be zinc plated with a gold chem. finish.
9. Touch-up paint used on ladder rack and ladder rack system components will be color-matched to the finish on the ladder rack or component. A spray on and brush on option will be available.
10. Unless otherwise noted, finish on all metal components shall be epoxy-polyester hybrid powder coat (paint) black in color. Hardware will be zinc plated with a gold chem. finish.
11. Design Make: Chatsworths Products, Inc. (CPI), Cable Runway Accessories or approved equal.

2.12 BACKBOARDS

- A. Backboards: Plywood, fire-retardant treated, 3/4 by 48 by 96 inches A-C Grade.

1. Provide materials that comply with performance requirements in AWPAC27. Identify fire-retardant-treated wood with appropriate classification marking of UL, U.S. Testing, Timber Products Inspection, or another testing and inspecting agency acceptable to authorities having jurisdiction.
 2. Use treatment for which chemical manufacturer publishes physical properties of treated wood after exposure to elevated temperatures, when tested by a qualified independent testing agency according to ASTM D 5516, for plywood.
- B. All 4 walls shall be covered with rigidly fixed 3/4 inch A-C plywood with the A grade side facing outward. The plywood shall be void free and extend from 6 inches above the finished floor (AFF) to 102 inches AFF and capable of supporting the attached equipment.
- C. Comply with requirements in Division 09 Section "Paints and Coatings" for fire-retardant plywood.

2.13 IDENTIFICATION PRODUCTS

- A. Comply with TIA/EIA-606-C and UL 969 for labeling materials, including label stocks, laminating adhesives, and inks used by label printers.
- B. Comply with requirements in Division 16 Section "Electrical Identification."

PART 3 - EXECUTION

3.1 RACEWAY APPLICATION

- A. Comply with TIA/EIA-569-E for pull-box sizing and length of conduit and number of bends between pull points.
- B. Outdoors:
1. Exposed: Rigid Steel
 2. Concealed: Rigid Steel
 3. Underground, Single Run: RNC.
 4. Underground, Grouped: RNC.
 5. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 6. Boxes and Enclosures: NEMA 250, Type 4.
- C. Indoors:
1. Exposed: RNC.
 2. Concealed: EMT.

3. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
4. Damp or Wet locations: Rigid steel conduit.
5. Boxes and Enclosures: NEMA 250, Type 1, except as follows:
 - a. Damp or Wet Locations: NEMA 250, Type 4, stainless steel
- D. Minimum Raceway Size: 3/4-inch trade size (DN 21).
- E. Raceway Fittings: Compatible with raceways and suitable for use and location.
- F. Intermediate Steel Conduit: Use threaded rigid steel conduit fittings, unless otherwise indicated.

3.2 CONDUIT AND RACEWAY INSTALLATION

- A. Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot water pipes. Install horizontal raceway runs above water and steam piping.
- B. Complete raceway installation before starting conductor installation.
 1. Support raceways as specified in Division 16 Section "Electrical Supports."
 2. Install temporary closures to prevent foreign matter from entering raceways.
- C. Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above the finished slab.
- D. Make bends and offsets so ID is not reduced. Keep legs of bends in the same plane and keep straight legs of offsets parallel, unless otherwise indicated.
- E. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
 1. Install concealed raceways with a minimum of bends in the shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.
- F. Raceways Embedded in Slabs: Not permitted, unless indicated otherwise on the drawings. Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.
- G. Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow surface contours as much as possible.
 1. Run parallel or banked raceways together on common supports.
 2. Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.
- H. Join raceways with fittings designed and approved for that purpose and make joints tight.

1. Use insulating bushings to protect conductors.
- I. Tighten set screws of threadless fittings with suitable tools.
- J. Terminations:
 1. Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install knockouts with dished part against box. Use two locknuts, one inside and one outside box.
 2. Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.
- K. Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90 kg) tensile strength. Leave at least 12 inches (300 mm) of slace at each end of pull wire. Pulling strings used for AV outlets and raceways shall have measuring indication on both ends.
- L. Telephone and Signal System Raceways, 2-inch trade size (DN 53) and smaller: In addition to above requirements, install raceways in maximum lengths of 150 feet (45 m) and with a maximum of two 90-degree bends or equivalent. Separate lengths with pull or junction boxes where necessary to comply with these requirements.
- M. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:
 1. Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
 2. Where otherwise required by NFPA 70.
- N. Stub-up Connections: Exntend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.
- O. Flexible Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in damp or wet locations. Install separate ground conductor across flexible connections.
- P. Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways to receptacle or fixture ground terminals.
- Q. Trim after installation to fit flush with finished floor surface.
- R. Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.3 INSTALLATION OF PATHWAYS

A. Pathway Installation in Communications Equipment Rooms:

1. Position conduit ends adjacent to a corner on backboard where a single piece of plywood is installed, or in the corner of room where multiple sheets of plywood are installed around perimeter walls of room.
2. Install cable trays to route cables if conduits cannot be located in these positions.
3. Secure conduits to backboard when entering room from overhead.
4. Extend conduits 3 inches (76 mm) above finished floor.
5. Install metal conduits with grounding bushings and connect with grounding conductor to grounding system.

3.4 NON-CONTINUOUS CABLE SUPPORTS

- A. Installation and configuration shall conform to the requirements of the current revision levels of ANSI/ EIA/TIA Standards 568 & 569, NFPA 70 (National Electrical Code), applicable local codes, and to the manufacturer's installation instructions.
- B. Do not exceed load ratings specified by manufacturer.
- C. Adjustable non-continuous support sling shall have a static load limit of 100 lbs.
- D. Follow manufacturer's recommendations for allowable fill capacity for each size non-continuous cable support.

3.5 WIRING METHODS

- A. Wiring Method: Install cables in raceways, J hooks, and cable trays except within consoles, cabinets, desks, and counters. Conceal raceway and cables accessible ceilings, walls, and floors except in unfinished spaces.
- B. Install plenum cable in environmental air spaces, including plenum ceilings.
- C. Wiring within Enclosures: Bundle, lace, and train cables to terminal points with no excess and without exceeding manufacturer's limitations on bending radii. Provide and use lacing bars and distribution spools.
- D. Comply with BICSI TDMM for layout and installation of communications equipment rooms.
- E. Provide equipment frames and ladder racking as outlined in telecommunications series drawings.

3.6 INSTALLATION TELECOMMUNICATIONS ROOMS

- A. Bundle, lace, and train conductors and cables to terminal points without exceeding manufacturer's limitations on bending radii. Install lacing bars and distribution spools.

- B. Bond the shield of any shielded cable to the grounding bus bar in communications rooms and spaces.
- C. Backboards: Install backboards with 96-inch dimension vertical. Butt adjacent sheets tightly, and form smooth gap-free corners and joints.
- D. Ladder Rack
 - 1. Provide all components of the ladder rack system (ladder rack, turns, splices, supports, and accessories) from a single manufacturer.
 - 2. Ladder rack shall be installed with side stringers facing down so that the ladder forms an inverted U-shape and so that welds between the stringers (sides) and cross members (middle) face away from cables.
 - 3. Ladder rack shall be secured to the structural ceiling, building truss system, wall, floor or the tops of equipment racks and/or cabinets using the manufacturer's recommended supports and appropriate installation hardware and methods as defined by local code or the authority having jurisdiction (AHJ).
 - 4. Ladder rack splices will be made in mid-span, not over a support, with the manufacturer's recommended splice hardware.
 - 5. Ladder rack shall be supported every 5' or less in accordance with TIA-569-E. Ladder rack shall be supported within 2' of every splice and within 2' on both/all sides of every intersection. Support ladder rack within 2' on both sides of every change in elevation. Support ladder rack every 2' when attached vertically to a wall.
 - 6. Heavy-duty splices are recommended for ladder rack in excess of 18" width (18" wide ladder rack). Heavy-duty splices are required for any splice formed in the vertical orientation including changes in elevation formed using vertical-to-horizontal 90° turns or horizontal-to-vertical 90° turns. Use heavy-duty splices to secure all overhead turns to the overhead horizontal pathway(s).
 - 7. When the pathway is overhead, ladder rack shall be installed with a minimum clearance of 12" above the ladder rack. Leave a minimum of 12" in between ladder rack and ceiling/building truss structure. Leave a minimum of 3" in between ladder rack and the tops of equipment racks and/or cabinets. Multiple tiers of ladder rack shall be installed with a minimum clearance of 12" in between each tier of ladder rack. When located above an acoustical drop ceiling, leave a minimum of 3" clearance between the top of the drop ceiling tiles and the bottom of the ladder rack.
 - 8. When installed under a raised floor, ladder rack shall be installed with a minimum 3" clearance between the top of the ladder rack and the bottom of the floor tiles or floor system stringers, whichever is lower in elevation. Maintain a 3" clearance between ladder racks wherever ladder racks cross.
 - 9. Within each telecommunications room, ladder rack should be bonded together, electrically continuous, and bonded to the TGB, unless otherwise noted in the specifications and contract documents. Ladder rack and turns shall be bonded across each splice with a bonding kit. Ladder rack shall be bonded to the Telecommunications Grounding Busbar (TGB) using an approved ground lug on the ladder rack and a minimum #6 grounding wire

or as recommended by the AHJ. Remove paint from the ladder rack where bonding/ground lugs contact the ladder rack so that the lug will contact bare metal. Use antioxidant joint compound in between the bare metal on the ladder rack and ground lug. Use antioxidant joint compound in between the bus bar and the ground lug. Verify continuity through the bonds at splices and intersections between individual ladder rack sections and turns and through the bond to the TGB.

10. The quantity of cables within the ladder rack will not exceed a whole number value equal to 50% of the interior area of the ladder rack divided by the cross-sectional area of the cable. The interior area of ladder rack will be considered to be the width of the ladder rack multiplied by a height of 2", unless cable retaining posts are added to the ladder rack. The interior area of ladder rack equipped with cable retaining posts will be considered to be the width of the ladder rack multiplied by a height of 6". Actual cable fill for ladder rack that is not equipped with cable retaining posts will not exceed 2" in height. Actual cable fill for ladder rack equipped with cable retaining posts will not exceed 6" in height.
11. The combined weight of cables within the ladder rack will not exceed the stated load capacity of the ladder rack as stated in the manufacturer's product specifications or load/design tables.
12. Cables (cable bundles) will be secured to the cross members of ladder rack with $\frac{3}{4}$ " wide reusable straps. Straps are not required when ladder rack is equipped with cable retaining posts.
13. Add 8" high cable retaining posts to the open sides of ladder rack when cable fill exceeds 2" in height or when cable bundles cannot be secured directly to the ladder rack cross members with a strap. Cable fill within any ladder rack should not exceed 6" in height.
14. When a single ladder rack supports different types of cable media, the cable media will be separated within the pathway by cable spools that attach to the cross members on the ladder rack. Treat each type of cable media and divided area of the ladder rack separately when determining cable fill limits.
15. Use a radius drop to guide cables wherever cable exits overhead ladder rack to access a rack, frame, cabinet or wall-mounted rack, cabinet or termination field. If necessary, provide a moveable cross member also to attach and align the radius drop in between the welded cross members of a ladder rack.
16. Cover the exposed ends of cable runway that do not terminate against a wall, the floor or the ceiling with end caps or an end closing kit.
17. Use auxiliary support brackets that attach to the side stringer of the ladder rack to support interconnect cabling (patch cords, equipment cords, jumper cords) that is routed between racks using the ladder rack. Auxiliary support brackets can be used to support other conductors that should be physically separated from cables within the ladder rack as defined by local code or the authority having jurisdiction (AHJ).
18. Whenever possible, maintain a 2' separation between ladder rack used for communications cables and pathways for other utilities or building services.
19. Provide touch-up paint color-matched to the finish on the ladder rack and correct any minor cosmetic damage (chips, small scratches, etc.) resulting from normal handling during the

installation process prior to delivery. If a component is cosmetically damaged to the extent that correction in the field is obvious against the factory finish, the component will be replaced with a new component finished from the factory. If a component is physically damaged due to mishandling or modification during the installation process, it shall not be used as part of the ladder rack system.

3.7 FIRESTOPPING

- A. Comply with requirements in Division 07 Section "Penetration Firestopping."
- B. General: Install through-penetration firestop systems in accordance with Performance Criteria and in accordance with the conditions of testing and classification as specified in the published design.
- C. Install EZ Path Series 44 in Telecommunications Rooms as shown on contract drawings.
- D. Install EZ Path or EMT sleeve where horizontal cables penetrate a fire or smoke rated wall.
- E. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of firestopping products.
- F. Comply with TIA/EIA-569-E, "Firestopping."
- G. Comply with BICSI TDMM, "Firestopping Systems" Article.
- H. Any penetrations created for the passage of telecommunications shall be fire stopped.
- I. Install fire stop units as per manufactures Instructions.

3.8 GROUNDING

- A. Install grounding according to BICSI TDMM, "Grounding, Bonding, and Electrical Protection" Chapter.
- B. Comply with requirements in division 270526 "Grounding and Bonding for Communications Systems" for grounding conductors and connectors.
- C. Comply with ANSI-J-STD-607-D.
- D. Bond metallic equipment to the grounding bus bar, using not smaller than No. 6 AWG equipment grounding conductor.

3.9 IDENTIFICATION

- A. Identify system components complying with TIA/EIA-606-C. Comply with requirements for identification specified in Division 16 Section "Electrical Identification."
- B. Comply with requirements in Division 9 Section "Interior Painting" for painting backboards. For fire-resistant plywood, do not paint over manufacturer's label.

3.10 REPAIR/RESTORATION

1. Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of substantial completion.
2. Protect adjacent surfaces. Repair damage to any surfaces occurring as a result of the work of this Section. Repair of surfaces shall include re-painting in accordance with Division 09 Section "Painting."
3. Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
4. Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

3.11 CLEANING

- A. After completing installation of exposed, factory-finished raceways and boxes, inspect exposed finishes and repair damaged finishes.
- B. At the completion of the System, restore aspects of the project site to its former condition. Remove daily waste and excess materials, rubbish debris, tools and equipment resulting from or used in the services provided under this Contract. Remove trash from all work areas. Do not use dumpsters or trash disposal without prior approval.

END OF SECTION 27 05 28

SECTION 27 05 28.36 - CABLE TRAYS FOR COMMUNICATIONS SYSTEMS

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. Continuous, rigid, welded steel wire mesh cable tray system used in industrial, commercial, and telecommunications applications
- B. Cable tray systems are defined to include, but are not limited to, straight sections, supports and accessories.

1.2 RELATED DOCUMENTS

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

1.3 SUMMARY

A. Related Sections:

- 1. Comply with Section 27 10 00, "Telecommunications Structured Cabling," for voice and data cabling associated with system panels and devices.

B. Bidding Requirements:

- 1. Submit complete detailed proposals with line item cost representation for components and associated installation labor. Lump sum bids will not be accepted.
- 2. Include as part of the bid response the following items:
 - a. Installation schedule with proposed manpower assignments.
 - b. Resumes for project manager and lead technician for this project.
- 3. Review associated electrical, audiovisual, and telecommunications infrastructure drawings to verify that necessary conduit and boxes will be provided. Understand and coordinate shared infrastructure locations for AV and voice/data outlets. No additional infrastructure to support the telecommunications cabling systems (inside plant/outside plant) will be provided. Any discrepancies with the identified infrastructure to support these systems should be questioned in the form of a request for information (RFI) during the bidding process. Be responsible for any additional infrastructure requirements after receipt of contract for this project.
- 4. No wiremold or surface mounted raceways shall be approved on this project except where explicitly identified.

1.4 REFERENCES

- A. IEC 61537 (2006) – Cable Tray Systems and Cable Ladder Systems for Cable Management
- B. NEMA VE 1-2017/CSA C22.2 No. 126.1-17 – Metal Cable Tray Systems

- C. ANSI/NFPA 70 – National Electrical Code (NEC)
- D. TIA 569-D (2015) – Commercial Building Standard for Telecommunications Pathways & Spaces
- E. ASTM A 510 - Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel
- F. ASTM A 380 – Specification for Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems
- G. ASTM B 633 – Specification for Electrodeposited Coatings of Zinc on Iron and Steel
- H. ASTM A 123 – Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
- I. ASTM A 653 - Specification for Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process, Structural (Physical) Quality
- J. Norm NF/A 91-131 for Galvanized Steel
- K. Norm NF/EN 12-329 for Electrocoat
- L. Norm NF/EN/ISO 14-61 for Hot-Dipped Galvanized Steel
- M. Norm NF 10-088-2 for Stainless Steel

1.5 SYSTEM DESCRIPTION

- A. This section outlines the performance for the noted cable tray support systems, as indicated on the low voltage drawings. The tray system shall provide a common raceway for telecommunications cable into and out of the Telecommunications Rooms (TR). Cable tray systems shall also be installed above finished ceiling in the common area hallways that are located on all floors of the building. The common area cable tray is intended to support telecommunications cabling from any of the station cable wall/floor outlet locations on any floor. Each station cable wall/floor outlet shall have a configuration of conduit pipe run to the tray system to support the aforementioned station cabling. It is intended to have this tray system transition (via a Cable Dropout or Runway Radius Drop) into the ladder tray installed above the noted equipment racks within the TR's.

1.6 DESIGN REQUIREMENTS

- A. Maximum Deflection between Supports: $L/240$

1.7 SUBMITTALS

- A. Related Sections

- 1. Comply with requirements of Section 01 33 00, "Submittal Procedures."

- B. Submittal Data

1. Submittal data is to be submitted as a complete, single digital file. All documents shall be clearly legible. Each submittal shall contain the below in the following order:
 - a. Cover Sheet
 - 1) Include name of supplying contractor and project name.
 - 2) Include submittal and revision number.
 - b. Detailed Bill of Materials
 - 1) Include a listing of: component quantities, equipment manufacturers, model numbers, descriptions of each component being supplied, and the specification paragraphs or drawing sheets that correspond to each product.
 - 2) The bill of materials shall be index referenced within the PDF file so that each product name is clickable, linked to the first page of the corresponding product data.
 - 3) Failure to provide this information will result in the rejection of submittals.
 - c. Product Data
 - 1) Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product.
 - 2) Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed if they provide adequate clarity of both the printed word and graphics/pictures.
 - 3) If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight. All optional components and selections shall be clearly indicated.
 - d. Prequalification Certificate.
 - 1) Copy of the installing technician(s) certificate of completion from the manufacturer's training school for the equipment being provided.
 - e. Manufacturer Qualifications
 - 1) Submit manufacturer's certification indicating ISO 9002 quality certified.
 - f. Design Calculations
 - 1) Verify loading capacities for supports.
 - g. Submit Factory-certified test reports of specified products, complying with IEC 61537, NEC, and NEMA VE 1/CSA C22.2 No. 126.1.

C. Shop Drawings

1. Prior to fabrication submit contractor-generated drawings for approval for all supplied systems. These drawings shall include, but are not limited to, the following:
 - a. Title Sheet with sheet index and symbols legend
 - b. Coordination Drawings: Include floor plans and sections drawn to scale. Include scaled cable tray layout and relationships between components and adjacent structural and mechanical elements. Data presented on these drawings are as accurate as preliminary surveys and planning can determine. Field verification of all dimensions, routing, etc., is directed.
 - c. Cable Tray Drawings: Submit drawing indicating materials, finish, dimensions, and accessories. Show layout, support, and installation details.
2. Drawings should be at project standard scale and clearly legible.
3. Resubmission of contract drawings does not constitute a complete shop drawings submittal and is unacceptable. Such submittals will be rejected.

D. Form

1. Submit all materials for review as described above, specifically referenced to the specification paragraph number (where applicable).
 - a. Submit all drawings on sheets of one size, preferably the project standard size.
 - b. On submittal drawings, maintain 3/32" minimum lettering height. Submittals with text less than 1/16" in height may be rejected.
2. Partial Submittals may be rejected. If submitted individually and each in its entirety, the following submittals shall not be considered partial:
 - a. Personnel
 - b. Milestones
 - c. Conduit Verification Statement and Notifications
 - d. Rigging and Mounting Drawings
 - e. As-Built Documentation
3. Product Data and shop drawings must be submitted together in order to be reviewed.

1.8 QUALITY ASSURANCE

- A. Source Limitations: Obtain cable tray components through one source from a single manufacturer.
- B. Manufacturer Qualifications: ISO 9002 quality certified
- C. Comply with NFPA 70. National Electrical Code, Article 392: Cable Trays; provide UL Classification and labels.
- D. Provide ETL test documentation showing cable compression/deformation testing.

1.9 COORDINATION

- A. Coordinate layout and installation of cable tray with other installations.
 1. Revise locations and elevations from those indicated as required to suit field conditions and as approved by the Architect.
- B. Storage and Handling: Avoid breakage, denting and scoring finishes. Damaged products will not be installed. Store cable trays and accessories in original cartons and in clean dry space; protect from weather and construction traffic. Wet materials will be unpacked and dried before storage. Protect materials and finishes during handling and installation to prevent damage
- C. Delivery: Deliver materials to site in manufacturer's original, unopened containers and packaging, with labels clearly indicating manufacturer and material.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Manufacturers: Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:

1. Cablofil, Inc. (Basis of design)
2. NVent/WBT
3. Bline
4. Chatsworth
5. Snake Tray
6. approved equal.

2.2 CABLE TRAY SYSTEM

- A. Description: Cablofil EZ Tray continuous, rigid, welded steel wire mesh cable tray system
 1. Mesh System: Permits continuous ventilation of cables and maximum dissipation of heat
 2. Safety Edge: Continuous safety edge T-welded wire lip
 3. Wire Mesh: Welded at all intersections
- B. UL Classification: Straight sections 4 x 8, 12, 18 and 24 inches (108 x 200, 300, 450, and 600 mm), UL classified. Width of tray shall be determined based on not exceeding industry standards for fill ratios.
- C. Material: Carbon steel wire, ASTM A 510, Grade 1008. Wire welded, bent, and surface treated after manufacture
- D. Finish for Carbon Steel Wire: Finish applied after welding and bending of mesh
 1. Electro-Plated Zinc Galvanizing: ASTM B 633, Type III, SC-1
 2. Hot-Dip Galvanizing: ASTM A 123
- E. Nominal Dimensions:
 1. Mesh: 2 x 4 inches (50 x 100 mm)
 2. Straight Section Lengths: 80 inches (2,000 mm) and 118 inches (3,000 mm)
 3. Width: Cable tray widths shall be selected based on cable density. No tray shall exceed 50% manufacturer's stated capacity at time of initial installation.
 - a. 2 inches (50 mm)
 - b. 4 inches (100 mm)
 - c. 6 inches (150 mm)
 - d. 8 inches (200 mm)
 - e. 12 inches (300 mm)
 - f. 18 inches (450 mm)
 - g. 24 inches (600 mm)
 4. Depth: 4 inches (108 mm)

- 5. Wire Diameter: 0.177 inch (4.5 mm), minimum
- F. Fittings: Field fabricated in accordance with manufacturer's instructions from straight sections
- G. Support System: Standard
 - 1. Wall Installation: CS Bracket. Maximum tray width of 12 inches (300 mm)
 - 2. Trapeze Mounting to Ceilings: CS Profile. Maximum tray width of 18 inches (450 mm)
 - 3. Ceiling Installation: CSC Bracket. Maximum tray width of 12 inches (300 mm)
 - 4. Fasteners: As required by tray widths. Furnished by manufacturer.
- H. Support System: Caloric FAS System
 - 1. Floor and Wall Installation: FAS Profile
 - 2. Wall Installation:
 - a. FAS Universal Bracket. Maximum tray width of 24 inches (600 mm)
 - b. FAS L Bracket. Maximum tray width of 12 inches (300 mm)
 - 3. Ceiling Installation: FAS C Bracket. Maximum tray width of 12 inches (300 mm)
 - 4. Fasteners: Not required
- I. Hardware: Hardware, including splice connectors and support components, shall be furnished by the manufacturer.

2.3 ACCESSORIES

- A. Shielding Divider Strips: Divider strips to follow contour of cable tray run for shielding to run power and control cables in same tray. Pre-galvanized steel, [4 x 1-1/2 inches (108 x 30 mm)]
- B. Fittings: Provide tees, crosses, risers, elbows, radius tees, and other fittings as indicated, of the same materials and finishes as cable tray.
- C. Grounding: Provide GNDSB grounding lugs for attachment on tray of continuous ground conductor fixing system.

2.4 FIRE STOP CABLE PASS-THRU SLEEVES

- A. Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:
 - 1. Basis of design: Specified Technologies Inc.
 - 2. Approved equal by:
 - a. 3M Corporation
 - b. Hilti Corporation
 - c. Wiremold- Legrand Corporation

- B. Fire Rated Cable Pathways: Provide STI EZ-PATH™ Brand device modules comprised of steel raceway with intumescent foam pads allowing 0 to 100 percent cable fill. The following products are acceptable:

1. Specified Technologies Inc. (STI) EZ-PATH Series 44 Fire Rated Pathway
2. Specified Technologies Inc. (STI) EZ-PATH Series 33 Fire Rated Pathway

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Exam areas to receive cable management system. Notify the Architect of conditions that would adversely affect the installation or subsequent utilization of the system. Do not proceed with installation until unsatisfactory conditions are corrected.

3.2 INSTALLATION

- A. Install cable tray level and plumb according to manufacturer's written instructions, Coordination Drawings, original design, and referenced standards.
- B. Install cable management system at locations indicated on the drawings and in accordance with manufacturer's instructions. Install the cable tray system directly above the racks positioned within the space to allow for ease in cable management to and from the racks. Provide firestopping at penetration into/out of all telecommunications rooms.
- C. Load Span Criteria: Install and support cable management system in accordance with span load criteria of L/240.
- D. Cutting:
- a. Cut cable tray wires in accordance with manufacturer's instructions.
 - b. Cable tray wires must be cut with side-action bolt cutters with offset head to ensure integrity of protective galvanic layer.
 - c. Remove burrs and sharp edges from cable trays.
- E. Install cable management system using hardware, splice connectors, support components, and accessories furnished by manufacturer.
- F. Install expansion connectors where cable tray crosses building expansion joint and in cable tray runs that exceed 90 feet.
- G. Ground cable tray according to manufacturer's written instructions.
- H. The cable tray and ceiling installation shall allow for re-entry to accommodate additional cable to be pulled from all occupied spaces to their respective IDF locations on each floor. Provide the following clearance for all installation locations.
1. A minimum of 3" clear vertical space between ceiling tile and cable tray.
 2. A minimum of 8" access headroom above the cable tray system
 3. Enough clearance on both sides of the tray to maintain accessibility with a human hand.

- I. Provide bend limiters to maintain cable type bend radius whenever cable exists cable tray into TR rooms.
- J. Provide radius kits at all 90-degree turns.
- K. Certified Installers: Cable tray installers must have successfully completed Cablofil's Certified Installer program.

3.3 FIRESTOPPING

- A. Firestopping In Telecommunications Room at Cable Tray Entrance
 - 1. Install EZ Path Series 44 as shown on contract drawings.
- B. Firestopping where cable tray passes through a rated wall assembly.
 - 1. Install quantity of EZ Path series 33 or series 44 to 100% fill ratio of the size of cable tray at entrance to opening.
- C. General: Install through-penetration firestop systems in accordance with Performance Criteria and in accordance with the conditions of testing and classification as specified in the published design.
- D. Manufacturer's Instructions: Comply with manufacturer's instructions for installation of firestopping products.

END OF SECTION 27 05 28.36

SECTION 27 41 13 - MULTIMEDIA SYSTEMS FLOORBOX

PART 1 - GENERAL

1.1 SUMMARY

A. Section includes:

1. Multimedia Systems Floorboxes

1.2 PERFORMANCE REQUIREMENTS

- A. General: Floor boxes provide interface between power, audiovisual, and telecommunications cabling in concrete floors and decks at workstations or at activation locations requiring power, audiovisual, or communication device outlets.

1. ADA Compliance: Flush-mounted floor device outlets shall not create tripping hazards.

- B. Floor Mounted Connector Assembly: Watertight, rubber cable pass thru gasketed door and cover assembly, utilizing basket and connector mounting panel inserts. Customize cover/door opening so that cable pass-thru will accommodate the bundle of AV cabling specified, while maintaining the ability to fully close with cables connected.

- C. Labeling: Floor boxes shall bear the “cULus mark” issued by UL for units complying with both US and Canadian Standards.

- D. Standards: Comply with the following:

1. UL 514A
2. National Electrical Code

1.3 SUBMITTALS

A. Related Sections

1. Comply with requirements of Section 01 33 00, “Submittal Procedures.”

B. Submittal Data

1. Submittal data is to be submitted as a complete, single digital file. All documents shall be clearly legible. Each submittal shall contain the below in the following order:
 - a. Cover Sheet
 - 1) Include name of supplying contractor and project name.
 - 2) Include submittal and revision number.
 - b. Detailed Bill of Materials
 - 1) Include a listing of: component quantities, equipment manufacturers, model numbers, descriptions of each component being supplied, and the specification paragraphs or drawing sheets that correspond to each product.

- 2) The bill of materials shall be index referenced within the PDF file so that each product name is clickable, linked to the first page of the corresponding product data.
- 3) Failure to provide this information will result in the rejection of submittals.
- c. Product Data
 - 1) Include a catalog sheet per product of equipment listed in the Detailed Bill of Materials, in the exact order as the Detailed Bill of Materials. Each catalog sheet shall describe mechanical, electrical and functional equipment specifications. The catalog sheet must also include an image of the product.
 - 2) Photocopy duplications of the manufacturer's original equipment catalog sheets will be allowed as long as they provide adequate clarity of both the printed word and graphics/pictures.
 - 3) If more than one product is shown on the catalog sheet the intended product must be denoted by either an arrow or highlight. All optional components and selections shall be clearly indicated.
 - 4) Indicate floor box models, trim, finish, and accessories.
2. Informational Submittals
 - a. Submit Manufacturer's installation instructions.
3. Partial submittals, or submittals comprised of multiple PDF files, will not be accepted.
- C. Photographs
 1. Submit photographs of each placed floorbox with associated conduit prior to slab pour.
- D. Shop Drawings
 1. Prior to fabrication submit contractor-generated drawings for approval for all supplied systems. These drawings shall include, but are not limited to, the following:
 - a. Title Sheet with sheet index and symbols legend
 - b. All panels, plates, and designation strips, including connectivity, layout, labeling, and details relating to terminology, engraving, finish and color
 - c. All unusual equipment modifications
 - d. Equipment location drawings, dimensioned to column lines
 - e. Include detailed elevation drawings, showing conduit runs and associated box knockout locations
 - f. Furniture coordination drawings, depicting planned cable pathway to furniture raceway or outlets, where applicable
 2. Drawings should be at project standard scale and clearly legible.
 3. Resubmission of contract drawings does not constitute a complete shop drawings submittal and is unacceptable. Such submittals will be rejected.
- E. Form
 1. Submit all materials for review as described above, specifically referenced to the specification paragraph number (where applicable).
 - a. Submit all drawings on sheets of one size, preferably the project standard size.

- b. On submittal drawings, maintain 3/32" minimum lettering height. Submittals with text less than 1/16" in height may be rejected.
- 2. Partial Submittals may be rejected. If submitted individually and each in its entirety, the following submittals shall not be considered partial:
 - a. Personnel
 - b. Milestones
 - c. Conduit Verification Statement and Notifications
 - d. Rigging and Mounting Drawings
 - e. As-Built Documentation
- 3. Product Data and shop drawings must be submitted together in order to be reviewed.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Subject to compliance with the specified requirements, provide products by one of the following available manufacturers. Manufacturers offering products that may be incorporated into the work include, and are limited to, the following:
 - 1. Legrand/Wiremold
 - 2. Approved equal
- B. Multimedia Systems Floorbox:
 - 1. In-slab: EFB8S-OG
 - 2. Raised floor: EFB8S
 - 3. Fire classified: EFB8S-FC

2.2 MATERIALS

- A. Door and Cover: Not lighter than 11-gauge steel with integral, self-trimming carpet trim ring. Mount trim ring flush with floor covering. Secure with security socket head screws.
 - 1. Finish: Satin black coating
 - 2. Trim: Door, cover, and integral trim ring shall have radiused corners.
- B. Device Plates
 - 1. Provide device plates as detailed on drawings.
 - 2. Provide blank plates for all unused openings.
- C. In-slab Boxes
 - 1. 11-gauge steel, 15 13/16 inches by 12 3/4 inches by 6 1/16 inches deep

2. Mount on manufacturer's backbox.
- D. Raised floor Boxes
 1. 11-gauge steel, 15 13/16 inches by 12 3/4 inches by 6 1/16 inches deep
 2. Provide toggle clamps to allow box to be secured to raised floors.
- E. Fire classified floor Boxes
 1. 11-gauge steel, 15 13/16 inches by 12 3/4 inches by 6 1/16 inches deep
 2. Provide fire-rated backbox and install per manufacturer's instructions.
 3. All boxes shall maintain a minimum of 1 hour of fire rating.
- F. Provide pull strings in each conduit at floor box location. Coordinate conduit to box knockout location with telecommunication cabling and audiovisual systems requirements.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. The minimum concrete pour depth shall be 7 inches less decking. For pour depths less than 7 inches, provide structural bracing and firestopping as necessary.
- B. With Installer present, verify that manufacturer's requirements for floor opening and infrastructure conditions have been satisfactorily met. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Arrange for jobsite approval of the equipment prior to installation.
- B. Verify exact locations of floorbox installation.
- C. Coordinate all box locations with furniture onsite prior to installation.

3.3 INSTALLATION

- A. Install equipment in compliance with approved shop drawings and manufacturer's installation instructions.
- B. Install in position and relationship to adjoining work indicated, securely anchored to supporting structure, sealed and finished, and in a manner which produces a level box with square, plumb, and straight edges.
- C. Coordinate installation with floor covering to finish each floor box. Install floor covering with oversized cable management pop-up pass-thru in top, matching surrounding floor covering in cover insert.

3.4 ADJUSTING

- A. Adjust door/cover for proper operation.

3.5 PROTECTION

- A. Protect installed equipment in original undamaged condition until Substantial Completion. Replace damaged components for units that cannot be repaired prior to Substantial Completion.

END OF SECTION 27 41 13

28 05 00 - COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

PART 1 - GENERAL

01.01 GENERAL CONDITIONS

- A. Each contractor involved in the electrical work or any section of Division 28 for this project shall be governed by this section in its entirety.
- B. Drawings and general provisions of Contract, including General and Supplementary Conditions, apply to this and other sections of Division 28.
- C. The Division 28 contractor shall bid to, and be a subcontractor of, the Division 26 Contractor.

01.02 RELATED WORK

- A. Specified elsewhere:
 - 1. Division 8 Builder's Hardware
 - 2. Division 11 Door Hardware
 - 3. Division 26 Basic Electrical Requirements
 - 4. Division 28

01.03 DESCRIPTION OF WORK

- A. Providing the security electronics equipment and integration to the existing security system.
- B. Provide all labor, equipment, materials, and supervision to install, program, calibrate, adjust, document, and test the total system as required herein and on the drawings.
- C. The Division 26 contractor shall be responsible for designing, providing, and installing the conduit raceway system, and the wire/cable system required for the Division 28 supplied material. This includes all on-site skilled labor, standard back boxes, junction boxes, pull boxes, cutting and patching. The Division 26 contractor shall be responsible for mounting and installing all custom back boxes, including camera housings being supplied by Division 28. The actual routing of conduits is to be determined by the Division 26 contractor with consideration to the actual construction documents, while keeping mind the requirements of Division 26 and coordinating with other trades.
- D. All wire/cable provided by the Division 26 contractor shall be in conduit. Cabling shall be continuous and shall not be spliced between the field-mounted device and the head-end equipment termination location(s). All cabling located underground and exterior to a building shall be UL listed for direct burial. The Division 26 contractor shall provide that

DIVISION 28

COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

all system wiring be color coded with labeling and coding as submitted and approved by shop drawings. Color coding and tagging shall be maintained throughout the system at all accessible locations to the cabling.

- E. The Division 26 contractor shall perform an acceptance test of all installed cabling for the security systems. A report shall be submitted to the Division 28 integrator and the Architect. All low voltage cabling shall be tested for open circuit, ground fault or line-to-line shorts. The Division 26 contractor shall assist the Division 28 integrator in the final system checkout of all security systems. Cabling found defective during cable testing or upon final system checkout shall be replaced by the Division 26 Contractor at no cost to the project.
- F. Division 28 shall be responsible for all field device and head-end equipment installation and terminations. The Division 28 integrator shall provide camera lens adjustments, system startup and documentation detailing the installation. The Division 26 contractor shall provide any ladders or lifts required by the Division 28 integrator during the testing phase of the project.
- G. The Division 26 contractor shall be responsible for the coordination of door frames and hardware and their required conduit entries with Division 8 and Division 11. The Division 26 contractor shall coordinate pre-cast equipment and steel cell equipment rough-in requirements and conduit routings with the Division 11 contractor. The Division 28 integrator shall be responsible for coordinating with Division 8 and Division 11, the power and cabling requirements of all electric strikes, electro-mechanical locks, solenoids, door position indicators, or any other device associated and controlled/monitored by the Security Control System.
- H. Door locks or operators and door position indicating switches are provided by Division 28 but shall be installed by Division 8 for builder's hardware type and Division 11 for detention type.

01.04 SUBMITTALS

- A. Submit in accordance with conditions of Contract and Division 1 specification sections.
- B. Bill of Materials
 - 1. Provide a complete bill of materials for all major components, accessories, and hardware to be provided in order to assemble a complete system.
- C. Shop drawings
 - 1. All Security Control System drawings generated for this project shall be created utilizing AutoCAD 2007 or greater file format.
 - 2. Drawings shall be submitted on a minimum of 11" x 17" sheets of paper.
 - 3. Submit shop drawings for all equipment showing:
 - a. Location and layout of all field equipment on floor plans.

- b. Security Control System Riser, Intercom Riser, Ethernet Riser, Video Riser, and PLC System Riser diagrams. Drawings shall include all interconnecting wiring, cable types and sizing. Provide manufacturers wire type where required.
- c. Provide power distribution and power loading spreadsheets.
- d. Block diagram(s) depicting system integration details.
- e. Elevations of all security racks and cabinets showing equipment mounting locations.
- f. Drawings for each field device type detailing wiring and mounting instructions.
- g. Point-to-point wiring data, utilizing a combination of AutoCAD generated drawings and security control point schedules. The schedules shall be created with Microsoft Excel and shall cross-reference AutoCAD drawings as required.
- h. Drawings for the PLC I/O configuration shall include model numbers of each component used and all required switch settings for proper operation and configuration of the system.
- i. Provide all Graphical User Interface layouts. Layouts shall be created by the GUI configuration software and shall not consist of line drawings created by CAD programs.
- j. Provide fully dimensioned Graphic Control Panel layout drawings. (when specified – see contract documents)

D. Product Data

- 1. Provide product data sheet(s) for each type of product specified. Data sheets showing multiple products or models shall be clearly marked identifying the specific product or model being proposed.
 - a. Provide original data sheets only. Fax copies are not acceptable.
 - b. Product data sheets shall include the specification section that the product is located in at the top of each data sheet.
- 2. Product data sheets shall be provided in three ring binders with tabs identifying each specification section.

01.05 QUALITY ASSURANCE

- A. Sole source responsibility: The Division 28 integrator shall perform all work necessary for the complete and operational integration of all sections of Division 28. The integrator will assume all responsibility for the system and shall NOT subcontract or in any way use

DIVISION 28

COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

another company to develop, integrate or program any portion of the GUI and PLC systems. The integrator shall assume responsibility for compatibility for system components furnished.

- B. Division 28 Integrator Qualifications: Engage an experienced systems integrator who is a Microsoft Certified Partner. This will establish an appropriate level of capability required when using Microsoft-compatible software.
- C. The Division 28 integrator shall not use door control or power distribution boards. All door control and power distribution shall be accomplished using discreet din-rail mounted terminals, relays, and fuses.
- D. Installer Qualifications: Engage an experienced installer who is a factory trained service representative to perform the work in this section.
- E. UL Listing and Labeling: Unless specific equipment specified within the Division 28 specifications is not listed or labeled by UL, provide components specified in the Division 28 specifications that are listed and labeled by UL.
- F. All work shall conform to the National Electrical Code (NEC) and to applicable National Fire Protection Association (NFPA) codes.
- G. Compliance with Local Requirements: Comply with the applicable building code, state and local ordinances, and regulations and the requirements of the authority having jurisdiction.

PART 2 - PRODUCTS

02.01 CARD READERS

- A. All products must be new and unused and without blemish or defect.
- B. The proximity reader shall be a HID Corp. model 40TKS-00-00BMMD

02.02 CAMERAS

- A. Fixed Interior 5MP Dome Cameras
 - 1. Manufacturer Hanwha QNV-8080R
 - 2. Approved Equal Axis
- B. 20MP Multi-Sensor Exterior Cameras
 - 1. Manufacturer Hanwha PNM-9085RQZ1
 - 2. Approved Equal Axis
 - 3. Mounts
 - a. Parapet Mount P/N SBP-300LMW

- b. Hanging Cap P/N SBP-317HMW
- c. Installation Box P/N SBP-300NBW

02.03 DOOR HARDWARE

- A. Electrified Commercial Door Lock
 - 1. Provided by Division 28 but installed by Division 8
 - 2. Manufacturer Schlage ND Series Electrified Locks
- B. Electrified Transfer Hinge
 - 1. Provided by Division 28 but installed by Division 8
 - 2. Electric Power PTH-4Q
- C. Non-Electrified Commercial Door Lock
 - 1. Provided by Division 28 but installed by Division 8
 - 2. Manufacturer Schlage ND Mechanical Series Locks

02.04 WALK THROUGH METAL DETECTOR

- A. 60 localization zones
- B. Accurate Detection of magnetic, non-magnetic and mixed-alloy metal weapons
- C. High Discrimination and Throughput
- D. Automatic Vibration Compensation
- E. Automatic Floor Gain Adjustment
- F. Manufacturer
 - 1. CEIA USA
 - a. HI-PE PLUS
 - 2. Garrett
 - a. PD 65001
 - 1) 32" ADA Pass through width

02.05 BAGGAGE SCANNER

- A. Tunnel Dimensions 24.4" (W) x 16.5" (H)
- B. Conveyor Height 31.5"

DIVISION 28
COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

- C. Flat Panel Monitor
- D. Meets all applicable laws and regulations with respect to X-Ray emitting devices
- E. Manufacturer
 - 1. Smiths Detection
 - a. HI-SCAN 6040C

PART 3 - EXECUTION

03.01 INSPECTION

- A. Examine conditions, with the Installer present, for compliance with requirements and other conditions affecting the performance of the intercommunication system work.
- B. Do not proceed until unsatisfactory conditions have been corrected.

03.02 INSTALLATION

- A. General: Install system in accordance with NFPA 70 and other applicable codes. Install equipment in accordance with manufacturer's written instructions.
- B. Wiring Methods: Install wiring in raceway except consoles, desks, and counters.
- C. Control Circuit Wiring: Install control circuits in accordance with NFPA 70 and as indicated. Provide number of conductors as recommended by system manufacturer to provide control functions indicated or specified.
- D. Wiring within Enclosures: Provide adequate length of conductors. Bundle, lace, and train the conductors to terminal points with no excess. Provide and use lacing bars or tie wraps.
- E. Splices, Taps, and Terminations: Make splices, taps and terminations on terminal strips in junction, pull, and outlet boxes, terminal cabinets and equipment enclosures.
- F. Identification of Conductors and Cables: Use color coding of conductors or apply wire and cable marking tape to designate wires and cables so all media are identified in coordination with system wiring diagrams.
- G. Weatherproofing: Provide weatherproof enclosures for items to be mounted outdoors or exposed to weather.
- H. Repairs: Wherever walls, ceilings, floors, or other building finishes are cut for installation, repair, restore, and refinish to original appearance.

03.03 TESTING AND DEMONSTRATION

- A. The Security Control System, excluding field devices, shall be assembled complete and 100% tested in the Division 28 integrator's facility prior to shipment of the headend equipment to site. This includes all applicable equipment specified in all sections of Division 28 and any other component deemed necessary by the Architect to be demonstrated. All software for all systems shall be programmed and tested. Provide a written checklist of every headend component and PLC input and output point tested with the appropriate test instrument.
- B. The testing shall include attachment and proper operation of a typical field device to each and every point of field device connection. While testing is demonstrated to the Architect and Owner, the Architect may randomly choose field device connection points to be connected and operated. Because the system shall be 100% tested, these field devices shall operate properly.

03.04 FIELD QUALITY CONTROL

- A. Division 28 Integrator's Field Services: Provide services of a field technician employed by the integrator to supervise, as required in a technical support role, the field assembly and connection of components and the pre-testing, testing, and adjustment of the system.
- B. Pre-testing: Upon completing installation of the system, align, adjust, and balance the system and perform complete pretesting. Determine, through pretesting, the conformance of the system to the requirements of drawings and specifications. Correct deficiencies observed in pretesting. Replace malfunctioning or damaged items with new and retest until satisfactory performance and conditions are achieved.
- C. Testing: Upon completion of pretesting, notify the Architect a minimum of 10 days in advance, of acceptance test performance schedule. It shall be the architect's option to have the integrator conduct tests in his or her presence. Provide a written record of test results. This process shall be known as the "system validation".
- D. Operational Test: Perform an operational system test to verify conformance of system to these specifications.
- E. Inspection: Make observations to verify that units and controls are properly labeled, and interconnecting wires and terminals are identified.
- F. Retesting: Rectify deficiencies indicated by tests and completely retest work affected by such deficiencies at Division 28 integrator's expense. Verify by the system test that the total system meets the Specifications and complies with applicable standards.

03.05 TRAINING

- A. Train Owner's maintenance and operator personnel in the procedures and schedules involved in operating, programming, troubleshooting, servicing, and preventative maintenance of the system. Provide a minimum of 16 hours training during normal business hours. Training shall include four 4 hour classes.

DIVISION 28
COMMON WORK RESULTS FOR ELECTRONIC SAFETY AND SECURITY

- B. Schedule training with Owner through the Architect, with at least seven days advance notice.

03.06 CLEANING AND PROTECTION

- A. Prior to final acceptance, clean system components and protect from damage and deterioration.

03.07 WARRANTY

- A. Provide maintenance of systems and equipment for a period of 12 months commencing with Owner acceptance of the systems., The Division 28 integrator shall demonstrate that they maintain a service organization capable of providing all necessary service and inspection to the systems, including replacement parts, and capability of making additions or changes to the software systems used in the project. The guarantee shall include the entire Division 28 scope of work including all equipment and software.
- B. During the warranty period, all service (including equipment, labor, travel, expenses, etc.) is to be provided during normal working hours at no cost to the Owner. On-site service must also be made available at times other than normal working hours to the Owner and shall be charged by the integrator's service representatives at current rates of labor and travel. The integrator shall provide the Owner with a manned, 24-hour phone number for service. The integrator shall not provide a pager number for a 24-hour phone service number. The integrator shall provide the Owner a phone response within 4 business hours of receipt of service call. The integrator shall provide an on-site response time of one business day for system critical items during regular business hours. Critical item components shall include PLC system components, GUI stations, video matrix switching equipment, perimeter detection equipment, officer duress equipment, intercom head-end equipment and uninterruptible power supplies.
- C. The guarantee shall exclude acts of God, vandalism, physical abuse or operator misuse. The integrator shall not be required to provide or diagnose problems associated with door switch or lock problems without additional reimbursement. The integrator shall not be responsible for any existing field devices/equipment that is not functional for whatever reason.
- D. Basic Services: Provide one routine maintenance visit 6 months prior to and a second visit at the end of the warranty period at a time coordinated with the Owner. Adjust and replace defective parts and components with original manufacturer's replacement parts, components, and supplies.
- E. Additional Services: Perform services within the above 12-month period not classified as routine maintenance or as warranty work as described in Division 1 Section "Warranties and Bonds" when authorized in writing. Compensation for additional services must be agreed upon in writing prior to performing services.
- F. Renewal of Maintenance Service Contract: No later than 60 days prior to the expiration of the maintenance services contract, deliver to the Owner a proposal to provide contract maintenance and repair services for an additional one-year term. Owner will be under no obligation to accept maintenance service proposal.

BCDC LOBBY RENOVATION
BALTIMORE COUNTY, MARYLAND
JOB ORDER NUMBER – PROJ-10001187
CONTRACT NUMBER – 25122 PO0

PROJECT MANUAL
100% CONSTRUCTION DOCUMENTS
6-13-2025

END OF SECTION

SECTION 28 46 21.11 - ADDRESSABLE FIRE-ALARM SYSTEMS

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. Manual fire-alarm boxes.
 - 2. System smoke detectors.
 - 3. Heat detectors.
 - 4. Notification appliances.
 - 5. Device guards.
 - 6. Digital alarm communicator transmitter.
 - 7. Network communications.

1.3 DEFINITIONS

- A. EMT: Electrical Metallic Tubing.
- B. HLI: High Level Interface.
- C. NICET: National Institute for Certification in Engineering Technologies.
- D. PC: Personal computer.

1.4 ACTION SUBMITTALS

- A. Product Data: For each type of product, including furnished options and accessories.
 - 1. Include construction details, material descriptions, dimensions, profiles, and finishes.
 - 2. Include rated capacities, operating characteristics, and electrical characteristics.
- B. Shop Drawings: For fire-alarm system.
 - 1. Comply with recommendations and requirements in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - 2. Include plans, elevations, sections, details, and attachments to other work.
 - 3. Include details of equipment assemblies. Indicate dimensions, weights, loads, required clearances, method of field assembly, components, and locations. Indicate conductor

sizes, indicate termination locations and requirements, and distinguish between factory and field wiring.

4. Detail assembly and support requirements.
5. Include voltage drop calculations for notification-appliance circuits.
6. Include battery-size calculations.
7. Include input/output matrix.
8. Include statement from manufacturer that all equipment and components have been tested as a system and meet all requirements in this Specification and in NFPA 72.
9. Include performance parameters and installation details for each detector.
10. Verify that each duct detector is listed for complete range of air velocity, temperature, and humidity possible when air-handling system is operating.
11. Include plans, sections, and elevations of heating, ventilating, and air-conditioning ducts, drawn to scale; coordinate location of duct smoke detectors and access to them.
 - a. Show critical dimensions that relate to placement and support of sampling tubes, detector housing, and remote status and alarm indicators.
 - b. Show field wiring required for HVAC unit shutdown on alarm.
 - c. Show field wiring and equipment required for HVAC unit shutdown on alarm and override by firefighters' control system.
 - d. Locate detectors according to manufacturer's written recommendations.
12. Include floor plans to indicate final outlet locations showing address of each addressable device. Show size and route of cable and conduits and point-to-point wiring diagrams.

C. General Submittal Requirements:

1. Submittals shall be approved by authorities having jurisdiction prior to submitting them to Architect.
2. Shop Drawings shall be prepared by persons with the following qualifications:
 - a. Trained and certified by manufacturer in fire-alarm system design.
 - b. NICET-certified, fire-alarm technician; Level III minimum.
 - c. Licensed or certified by authorities having jurisdiction.

D. Delegated-Design Submittal Include only if design is delegated to Contractor): For notification appliances and smoke and heat detectors, in addition to submittals listed above, indicate compliance with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

1. Drawings showing the location of each notification appliance and smoke and heat detector, ratings of each, and installation details as needed to comply with listing conditions of the device.
2. Design Calculations: Calculate requirements for selecting the spacing and sensitivity of detection, complying with NFPA 72. Calculate spacing and intensities for strobe signals and sound-pressure levels for audible appliances.
3. Indicate audible appliances required to produce square wave signal per NFPA 72.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Installer.

1. Basis for Certification: Indicate whether withstand certification is based on actual test of assembled components or on calculation.
2. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
3. Detailed description of equipment anchorage devices on which the certification is based and their installation requirements.

B. Field quality-control reports.

1.6 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fire-alarm systems and components to include in emergency, operation, and maintenance manuals.

1. In addition to items specified in other section for "Operation and Maintenance Data," include the following and deliver copies to authorities having jurisdiction:
 - a. Comply with the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 - b. Provide "Fire Alarm and Emergency Communications System Record of Completion Documents" according to the "Completion Documents" Article in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - c. Complete wiring diagrams showing connections between all devices and equipment. Each conductor shall be numbered at every junction point with indication of origination and termination points.
 - d. Riser diagram.
 - e. Device addresses.
 - f. Provide "Inspection and Testing Form" according to the "Inspection, Testing and Maintenance" chapter in NFPA 72, and include the following:
 - 1) Equipment tested.
 - 2) Frequency of testing of installed components.
 - 3) Frequency of inspection of installed components.
 - 4) Requirements and recommendations related to results of maintenance.
 - 5) Manufacturer's user training manuals.
 - g. Manufacturer's required maintenance related to system warranty requirements.

B. Software and Firmware Operational Documentation:

1. Software operating and upgrade manuals.
2. Program Software Backup: On magnetic media or compact disk, complete with data files.
3. Device address list.

1.7 QUALITY ASSURANCE

A. Installer Qualifications: Installation shall be by personnel certified by NICET as fire-alarm Level II technician.

- B. NFPA Certification: Obtain certification according to NFPA 72 by an NRTL (nationally recognized testing laboratory).

1.8 PROJECT CONDITIONS

- A. Perform a full test of the existing system prior to starting work. Document any equipment or components not functioning as designed.
- B. Interruption of Existing Fire-Alarm Service: Do not interrupt fire-alarm service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary guard service according to requirements indicated:
 - 1. Notify Construction Manager no fewer than seven days in advance of proposed interruption of fire-alarm service.
 - 2. Do not proceed with interruption of fire-alarm service without Construction Manager's written permission.
- C. Use of Devices during Construction: Protect devices during construction unless devices are placed in service to protect the facility during construction.

1.9 SEQUENCING AND SCHEDULING

- A. Existing Fire-Alarm Equipment: Maintain existing equipment fully operational until new equipment has been tested and accepted. As new equipment is installed, label it "NOT IN SERVICE" until it is accepted. Remove labels from new equipment when put into service, and label existing fire-alarm equipment "NOT IN SERVICE" until removed from the building.
- B. Equipment Removal: After acceptance of new fire-alarm system, remove existing disconnected fire-alarm equipment and wiring.

1.10 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace fire-alarm system equipment and components that fail in materials or workmanship within specified warranty period.
 - 1. Warranty Extent: All equipment and components not covered in the Maintenance Service Agreement.
 - 2. Warranty Period: Five (5) years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SYSTEM DESCRIPTION

- A. Source Limitations for Fire-Alarm System and Components: Components shall be compatible with, and operate as an extension of, existing system. Provide system manufacturer's certification that all components provided have been tested as, and will operate as, a system.

- B. Noncoded, UL-certified addressable system, with multiplexed signal transmission and horn/strobe evacuation.
- C. Automatic sensitivity control of certain smoke detectors.
- D. All components provided shall be listed for use with the selected system.
- E. 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.

2.2 MANUAL FIRE-ALARM BOXES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Notifier.

Siemens Industry, Inc.; Fire Safety Division.(preferred)
 - 2. Edwards EST.
 - 3. JCI Simplex.
 - 4.
- B. General Requirements for Manual Fire-Alarm Boxes: Comply with UL 38. Boxes shall be finished in red with molded, raised-letter operating instructions in contrasting color; shall show visible indication of operation; and shall be mounted on recessed outlet box. If indicated as surface mounted, provide manufacturer's surface back box.
 - 1. Station Reset: Key-switch.
 - 2. Indoor Protective Shield Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm. Lifting the cover actuates an integral battery-powered audible horn intended to discourage false-alarm operation.
 - 3. Weatherproof Protective Shield: Factory-fabricated, clear plastic enclosure hinged at the top to permit lifting for access to initiate an alarm, where applicable or as noted on plan drawings.

2.3 SYSTEM SMOKE DETECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Notifier.

Siemens Industry, Inc.; Fire Safety Division.(preferred)
 - 2. Edwards EST.
 - 3. JCI Simplex.
- B. General Requirements for System Smoke Detectors:
 - 1. Comply with UL 268; operating at 24-V dc, nominal.
 - 2. Detectors shall be standard addressable two-wire type in all applications and four-wire type for sounder or relay based operations.

3. Self-Restoring: Detectors do not require resetting or readjustment after actuation to restore them to normal operation.
 4. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
 - a. Multiple levels of detection sensitivity for each sensor, as recommended by manufacturer.
- C. Photoelectric Smoke Detectors:
- a. Primary status.
 - b. Device type.
 - c. Present average value.
 - d. Present sensitivity selected.
 - e. Sensor range (normal, dirty, etc.).
- D. Single-Station Smoke Detectors:
1. Auxiliary Relays: One Form A and one Form C, both rated at 0.5 A.
 2. Audible Notification Appliance: Piezoelectric sounder rated at 90 dBA at 10 feet (3 m) according to UL 464.
 3. Visible Notification Appliance: 177-cd strobe.
 4. Heat sensor, 135 deg F (57 deg C) fixed temperature.
 5. Test Switch: Push to test; simulates smoke at rated obscuration.
 6. Tandem Connection: Allow tandem connection of number of indicated detectors; alarm on one detector shall actuate notification on all connected detectors.
 7. Plug-in Arrangement: Detector and associated electronic components shall be mounted in a plug-in module that connects to a fixed base. Provide terminals in the fixed base for connection to building wiring.
 8. Self-Restoring: Detectors shall not require resetting or readjustment after actuation to restore them to normal operation.
 9. Integral Visual-Indicating Light: LED type, indicating detector has operated and power-on status.
- E. Single-Station Duct Smoke Detectors:
1. Comply with UL 268A; operating at 120-V ac.
 2. Sensor: LED or infrared light source with matching silicon-cell receiver.
 - a. Detector Sensitivity: Smoke obscuration between 2.5 and 3.5 percent/foot (0.008 and 0.011 percent/mm) when tested according to UL 268A.
 3. Base Mounting: Detector and associated electronic components shall be mounted in a twist-lock module that connects to a fixed base. The fixed base shall be designed for mounting directly to air duct. Provide terminals in the fixed base for connection to building wiring.
 - a. Weatherproof Duct Housing Enclosure: NEMA 250, Type 4X; listed for use with the supplied detector.
 4. Sampling Tubes: Design and dimensions as recommended by manufacturer for specific duct size, air velocity, and installation conditions where applied.
 5. Relay Fan Shutdown: Rated to interrupt fan motor-control circuit.

2.4 HEAT DETECTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Notifier.

Siemens Industry, Inc.; Fire Safety Division. (preferred)
 - 2. Edwards EST.
 - 3. JCI Simplex.
 - 4.
- B. General Requirements for Heat Detectors: Comply with UL 521.
 - 1. Temperature sensors shall test for and communicate the sensitivity range of the device.
- C. Heat Detector, Combination Type: Actuated by either a fixed temperature of 135 deg F (57 deg C) or a rate of rise that exceeds 15 deg F (8 deg C) per minute unless otherwise indicated.
 - 1. Mounting: Twist-lock base interchangeable with smoke-detector bases.

2.5 NOTIFICATION APPLIANCES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Notifier.

Siemens Industry, Inc.; Fire Safety Division.
 - 2. Edwards EST.
 - 3. JCI Simplex.
 - 4. .
- B. General Requirements for Notification Appliances: Connected to notification-appliance signal circuits, zoned as indicated, equipped for mounting as indicated, and with screw terminals for system connections.
 - 1. Combination Devices: Factory-integrated audible and visible devices in a single-mounting assembly, equipped for mounting as indicated, and with screw terminals for system connections.
- C. Horns: Electric-vibrating-polarized type, 24-V dc; with provision for housing the operating mechanism behind a grille. Comply with UL 464. Horns shall produce a sound-pressure level of 90 dBA, measured 10 feet (3 m) from the horn, using the coded signal prescribed in UL 464 test protocol.
- D. Visible Notification Appliances: Xenon strobe lights complying with UL 1971, with clear or nominal white polycarbonate lens mounted on an aluminum faceplate. The word "FIRE" is engraved in minimum 1-inch- (25-mm-) high letters on the lens.
 - 1. Rated Light Output:

- a. 15/30/75/110 cd, selectable in the field.
 - 2. Mounting: Wall mounted unless otherwise indicated.
 - 3. For units with guards to prevent physical damage, light output ratings shall be determined with guards in place.
 - 4. Flashing shall be in a temporal pattern, synchronized with other units.
 - 5. Strobe Leads: Factory connected to screw terminals.
 - 6. Mounting Faceplate: Factory finished, red.
- E. Exit Marking Audible Notification Appliance:
- 1. Exit marking audible notification appliances shall meet the audibility requirements in NFPA 72.
 - 2. Provide exit marking audible notification appliances at the entrance to all building exits.
 - 3. Provide exit marking audible notification appliances at the entrance to areas of refuge with audible signals distinct from those used for building exit marking.

2.6 DOCUMENTATION CABINET

- A. All record documentation shall be stored in a documentation cabinet. Where the documentation cabinet is not in the same location as the main fire alarm control panel, the location shall be clearly identified at the main fire alarm control panel.
- B. The cabinet shall be painted red and labeled "Fire Alarm System Record Documents".
- C. The record documentations shall size and housed at minimum the following list of documents:
 - 1. Written brief narrative providing intent and system description.
 - 2. Record as-built drawings.
 - 3. Equipment technical data sheets.
 - 4. Manufacturer's published instructions, including operation and maintenance instructions.
 - 5. Battery and voltage drop calculations.
 - 6. For software-based system, a copy of site-specific software including specific instructions on how to obtain the means of system and software access (password).
 - 7. Completed record of completion in accordance with NFPA 72.
 - 8. Completed record of inspection and testing in accordance with NFPA 72.

2.7 NETWORK COMMUNICATIONS

- A. Provide network communications pathway per manufacturer's written requirements and requirements in NFPA 72 and NFPA 70.
- B. Provide integration gateway using BACnet for connection to building automation system.
- C. Printer shall be listed and labeled as an integral part of fire-alarm system.

2.8 DEVICE GUARDS

- A. Description: Welded wire mesh of size and shape for the manual station, smoke detector, gong, or other device requiring protection.

1. Factory fabricated and furnished by device manufacturer.
2. Finish: Paint of color to match the protected device.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine areas and conditions for compliance with requirements for ventilation, temperature, humidity, and other conditions affecting performance of the Work.
 1. Verify that manufacturer's written instructions for environmental conditions have been permanently established in spaces where equipment and wiring are installed, before installation begins.
- B. Examine roughing-in for electrical connections to verify actual locations of connections before installation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EQUIPMENT INSTALLATION

- A. Comply with NFPA 72, NFPA 101, and requirements of authorities having jurisdiction for installation and testing of fire-alarm equipment. Install all electrical wiring to comply with requirements in NFPA 70 including, but not limited to, Article 760, "Fire Alarm Systems."
 1. Devices placed in service before all other trades have completed cleanup shall be replaced.
 2. Devices installed but not yet placed in service shall be protected from construction dust, debris, dirt, moisture, and damage according to manufacturer's written storage instructions.
- B. Connecting to Existing Equipment: Verify that existing fire-alarm system is operational before making changes or connections.
 1. Connect new equipment to existing monitoring equipment at the supervising station.
 2. Expand, modify, and supplement existing control and monitoring equipment as necessary to extend existing control and monitoring functions to the new points. New components shall be capable of merging with existing configuration without degrading the performance of either system.
- C. Install wall-mounted equipment, with tops of cabinets not more than 78 inches (1980 mm) above the finished floor.
 1. Comply with requirements for seismic-restraint devices specified in other section for "Seismic Controls for Communications Systems."
- D. Manual Fire-Alarm Boxes:
 1. Install manual fire-alarm box in the normal path of egress within 60 inches (1520 mm) of the exit doorway.

2. Mount manual fire-alarm box on a background of a contrasting color.
3. The operable part of manual fire-alarm box shall be between 42 inches (1060 mm) and 48 inches (1220 mm) above floor level. All devices shall be mounted at the same height unless otherwise indicated.

E. Smoke- or Heat-Detector Spacing:

1. Comply with the "Smoke-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for smoke-detector spacing.
2. Comply with the "Heat-Sensing Fire Detectors" section in the "Initiating Devices" chapter in NFPA 72, for heat-detector spacing.
3. Smooth ceiling spacing shall not exceed 30 feet (9 m).
4. Spacing of detectors for irregular areas, for irregular ceiling construction, and for high ceiling areas shall be determined according to Annex A in NFPA 72.
5. HVAC: Locate detectors not closer than 36 inches (910 mm) from air-supply diffuser or return-air opening.
6. Lighting Fixtures: Locate detectors not closer than 12 inches (300 mm) from any part of a lighting fixture and not directly above pendant mounted or indirect lighting.

F. Install a cover on each smoke detector that is not placed in service during construction. Cover shall remain in place except during system testing. Remove cover prior to system turnover.

G. Duct Smoke Detectors: Comply with NFPA 72 and NFPA 90A. Install sampling tubes so they extend the full width of duct. Tubes more than 36 inches (9100 mm) long shall be supported at both ends.

1. Do not install smoke detector in duct smoke-detector housing during construction. Install detector only during system testing and prior to system turnover.

H. Elevator Shafts: Coordinate temperature rating and location with sprinkler rating and location. Do not install smoke detectors in sprinklered elevator shafts.

I. Remote Status and Alarm Indicators: Install in a visible location near each smoke detector, sprinkler water-flow switch, and valve-tamper switch that is not readily visible from normal viewing position.

J. Audible Alarm-Indicating Devices: Install not less than 6 inches (150 mm) below the ceiling. Install horns on flush-mounted back boxes with the device-operating mechanism concealed behind a grille. Install all devices at the same height unless otherwise indicated.

K. Visible Alarm-Indicating Devices: Install adjacent to each alarm horn and at least 6 inches (150 mm) below the ceiling. Install all devices at the same height unless otherwise indicated.

L. Device Location-Indicating Lights: Locate in public space near the device they monitor.

3.3 PATHWAYS

- A. Pathways shall be installed in EMT.
- B. Exposed EMT shall be painted red enamel.

3.4 CONNECTIONS

- A. For fire-protection systems related to doors in fire-rated walls and partitions and to doors in smoke partitions, comply with requirements in other section for "Door Hardware." Connect hardware and devices to fire-alarm system.
 - 1. Verify that hardware and devices are listed for use with installed fire-alarm system before making connections.
- B. Make addressable connections with a supervised interface device to the following devices and systems. Install the interface device less than 36 inches (910 mm) from the device controlled. Make an addressable confirmation connection when such feedback is available at the device or system being controlled.
 - 1. Alarm-initiating connection to smoke-control system (smoke management) at firefighters' smoke-control system panel.
 - 2. Smoke dampers in air ducts of designated HVAC duct systems.
 - 3. Magnetically held-open doors.
 - 4. Electronically locked doors and access gates.
 - 5. Alarm-initiating connection to elevator recall system and components.
 - 6. Alarm-initiating connection to activate emergency lighting control.
 - 7. Alarm-initiating connection to activate emergency shutoffs for gas and fuel supplies.
 - 8. Supervisory connections at valve supervisory switches.
 - 9. Supervisory connections at low-air-pressure switch of each dry-pipe sprinkler system.
 - 10. Supervisory connections at elevator shunt-trip breaker.
 - 11. Data communication circuits for connection to building management system.
 - 12. Supervisory connections at fire-extinguisher locations.
 - 13. Supervisory connections at fire-pump power failure including a dead-phase or phase-reversal condition.

3.5 IDENTIFICATION

- A. Identify system components, wiring, cabling, and terminals. Comply with requirements for identification specified in other section for "Identification for Communications Systems."

3.6 FIELD QUALITY CONTROL

- A. Field tests shall be witnessed by authorities having jurisdiction.
- B. Manufacturer's Field Service: Engage a factory-authorized service representative to test and inspect components, assemblies, and equipment installations, including connections.
- C. Perform tests and inspections.
- D. Perform the following tests and inspections:
 - 1. Visual Inspection: Conduct visual inspection prior to testing.

- a. Inspection shall be based on completed record Drawings and system documentation that is required by the "Completion Documents, Preparation" table in the "Documentation" section of the "Fundamentals" chapter in NFPA 72.
 - b. Comply with the "Visual Inspection Frequencies" table in the "Inspection" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72; retain the "Initial/Reacceptance" column and list only the installed components.
 2. System Testing: Comply with the "Test Methods" table in the "Testing" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
 3. Test audible appliances for the public operating mode according to manufacturer's written instructions. Perform the test using a portable sound-level meter complying with Type 2 requirements in ANSI S1.4.
 4. Test audible appliances for the private operating mode according to manufacturer's written instructions.
 5. Test visible appliances for the public operating mode according to manufacturer's written instructions.
 6. Factory-authorized service representative shall prepare the "Fire Alarm System Record of Completion" in the "Documentation" section of the "Fundamentals" chapter in NFPA 72 and the "Inspection and Testing Form" in the "Records" section of the "Inspection, Testing and Maintenance" chapter in NFPA 72.
- E. Reacceptance Testing: Perform reacceptance testing to verify the proper operation of added or replaced devices and appliances.
- F. Fire-alarm system will be considered defective if it does not pass tests and inspections.
- G. Prepare test and inspection reports.
- H. Annual Test and Inspection: One year after date of Substantial Completion, test fire-alarm system complying with visual and testing inspection requirements in NFPA 72. Use forms developed for initial tests and inspections.

3.7 DEMONSTRATION

- A. Train Owner's maintenance personnel to adjust, operate, and maintain fire-alarm system.

END OF SECTION 28 46 21.11

SPECIAL PROVISIONS

Builder's Risk Insurance

- A. The Contractor shall, at his/her own cost, insure the work and keep it insured at all times during the period of construction, and until final acceptance of it by the County against loss of damage covered by an "All Risk" Builders Risk type of policy. The amount of insurance shall be the 100% estimated replacement cost of the work.
- B. The policies shall be made payable to the County and the Contractor, as their interest may appear, and the policies shall be left in the possession of the Engineer, prior to the start of construction.

S E C T I O N I I I

Permits

Building & Electrical Permits applied for by Baltimore County

SECTION I V

Proposal

**This Section to be
Completed by Time of Bid**

SECTION-IV
PROPOSAL

DESCRIPTION OF WORK

Bid Opening via Teleconference WebEx: Thursday, November 6, 2025 @ 10:45 a.m. EST.
WebEx Phone Number 1-415-655-0001, Access Code Number 2319 263 7423##.

Begin Work Within Fifteen (15) Days After NOTICE TO PROCEED

Calendar Days for Completion: Two Hundred Thirty-Five (235)

Liquidated and Other Damages: FIFTEEN HUNDRED DOLLARS (\$1500.00 PER CALENDAR DAY)

Cost Group “C” (\$500,001 to \$1,000,000) (Prequalified contractors with a Cost Group restriction must bid within the dollar amount stated on their Certificate of Prequalification)

Work Classification: I2

TO BALTIMORE COUNTY, MARYLAND: The work includes interior renovations to the main lobby to install a secure reception desk and renovate the security check points; a new office will be constructed and finishes will be upgraded. A second staff entrance will be created from an existing exterior door. New security check points will be constructed; existing partitions will be modified and new partition walls will be installed. Three (3) new offices will be constructed. Finishes will be upgraded. **Towson – District 9c6.**

The following listed Drawing Number(s) are collectively the “Drawings”, and are hereby incorporated in the Contract.

<u>Workday Number</u>	<u>Drawing Number(s)</u>
10001187	2025-2112 thru 2152

A pre-bid meeting will be held on Wednesday, October 22, 2025 at 11:00 a.m. EST via WebEx. *Phone-In (Audio Only)* – 1-415-655-0001, Meeting Number 2301 765 7029##. *Video Conference* – Meeting Number 2301 765 7029 , **Password: euMYN2wQH52**, go to <https://signin.webex.com/join>, or for the WebEx link go to www.baltimorecountymd.gov/departments/public-works/engineering/contracts/current-solicitations. **A site visit will be held on Friday, October 10, 2025 @ 9:00 A.M. to 12:00 P.M. EST.**

NOTE: No successful bidder may withdraw their bid within NINETY (90) days after the opening thereof.

The Contractor hereby declares that it has carefully examined the solicitation, plans and specifications, form of contract, Special Provisions and Drawings (collectively the “Contract Documents”). The Contractor also hereby declares that it has carefully examined the September 2023 “Standard Specifications for Construction and Materials” and “Standard Details for Construction”, collectively the “Applicable County Law” and any and all Department of Public Works and Transportation revisions thereto as of the date of advertisement. The Contract Documents, the Applicable County Law and the Department of Public Works and Transportation revisions thereto are collectively the “Specifications” and are incorporated herein. Copies of any and all Department of Public Works and Transportation revisions including but not limited to the General Conditions Building Projects, are available online at www.baltimorecountymd.gov/departments/public-works/standards. Also, the Contractor has, to its satisfaction, examined the locality of the proposed work and agrees to furnish all labor, tools, materials, machinery, equipment, and other means of construction called for in the manner provided in the Specifications for the prices shown on the next page(s) and as evidenced by Contractor’s signature on the last page thereof.

SCHEDULE OF PRICES

NOTE: The Bidder shall fill out this Proposal, write in the unit prices in clear numerals, and make the extensions.

For complete information concerning these items, see Specifications and contract forms.

CONTRACT PROPOSAL

Baltimore County Detention Center Lobby Renovations - 720 Bosley Avenue, Towson, Maryland 21204

CONTRACT NUMBER: 25122 PO0

WORKDAY NUMBER: 10001187

JOB ORDER NUMBER: N/A

CALENDAR DAYS: 235

CONTRACTOR: _____
ADDRESS: _____
PHONE: _____

BID ITEM	COMM. CODE		DESCRIPTION	UNIT	ESTIMATED QUANTITY	UNIT PRICE	TOTAL AMOUNT
1	0	0000	FRONT LOBBY RENOVATIONS & ADJACENT AREA FOR NEW ENTRANCE	LS	1		\$
TOTAL COST FOR CONTRACT							\$

TOTAL COST FOR CONTRACT IN WORDS

OFFICER SIGNATURE

TITLE

PROPOSAL AFFIDAVIT

1. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title]_____ and the duly authorized representative of [business]_____ (the "Business") and that I possess the legal authority to make this Affidavit on behalf of myself and the Business for which I am acting.

2. PROPOSAL CERTIFICATION

THE UNDERSIGNED HEREBY ACKNOWLEDGES receipt of the following Addenda (list by number and date):

Accompanying this Proposal is a Bid Bond in an amount of 5% of the bid, the exact amount to be determined by the difference between the low bid and the next lowest bid, if two or more bids are received, or 5% of the bid if one bid is received. This guarantees payment to Baltimore County of the amount thus determined as liquidated damages in case of default in any matter specified as required before award or in any matter resulting in failure to execute and deliver an Agreement, together with Payment and Performance Bonds, after award.

3. AFFIRMATION REGARDING BRIBERY CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies (as is defined in Section 16-101(f) of the State Finance and Procurement Article of the Annotated Code of Maryland), has been convicted of, or has had probation before judgment imposed pursuant to Section 6-225 of the Criminal Procedure Article of the Annotated Code of Maryland, or has pleaded nolo contendere to a charge of, bribery, attempted bribery, or conspiracy to bribe in violation of Maryland law, or of the law of any other state or federal law, except as follows [indicate the reasons why the affirmation cannot be given and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of person(s) involved, and their current positions and responsibilities with the Business]:

4. AFFIRMATION REGARDING OTHER CONVICTIONS

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has:

(1) Been convicted under state or federal statute of a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract, fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property;

(2) Been convicted of any criminal violation of a state or federal antitrust statute;

(3) Been convicted under the provisions of Title 18 of the United States Code for violation of the Racketeer Influenced and Corrupt Organization Act, 18 U.S.C. §1961, et seq., or the Mail Fraud Act, 18 U.S.C. §1341, et seq., for acts arising out of the submission of bids or proposals for a public or private contract;

(4) Been convicted of a violation of the State Minority Business Enterprise Law, Section 14-308 of the State Finance and Procurement Article of the Annotated Code of Maryland;

(5) Been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction or liability under any law or statute described in subsection (1), (2), (3), or (4) above;

(6) Been found civilly liable under a state or federal antitrust statute for acts or omissions in connection with the submission of bids or proposals for a public or private contract;

(7) Admitted in writing or under oath, during the course of an official investigation or other proceedings, acts or omissions that would constitute grounds for conviction or liability under any law or statute described above, except as follows [indicate reasons why the affirmations cannot be given, and list any conviction, plea, or imposition of probation before judgment with the date, court, official or administrative body, the sentence or disposition, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, and the status of any debarment]:

5. AFFIRMATION REGARDING DEBARMENT

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, partners, or any of its employees directly involved in obtaining or performing contracts with public bodies, has ever been suspended or debarred (including being issued a limited denial of participation) by any public entity, except as follows [list each debarment or suspension providing the dates of the suspension or debarment, the name of the public entity and the status of the proceeding, the name(s) of the person(s) involved and their current positions and responsibilities with the Business, the grounds of the debarment or suspension, and the details of each person's involvement in any activity that formed the grounds of the debarment or suspension]:

6. AFFIRMATION REGARDING DEBARMENT OF RELATED ENTITIES

I FURTHER AFFIRM THAT:

(1) The Business was not established and it does not operate in a manner designed to evade the application of or defeat the purpose of debarment pursuant to Sections 16-101, et seq., of the State Finance and Procurement Article of the Annotated Code of Maryland; and

(2) The Business is not a successor, assignee, subsidiary, or affiliate of a suspended or debarred business, except as follows: [you must indicate the reasons why the affirmations cannot be given without qualification]:

7. SUB-CONTRACT AFFIRMATION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, has knowingly entered into a contract with a public body under which a person debarred or suspended under Title 16 of the State Finance and Procurement Article of the Annotated Code of Maryland will provide, directly or indirectly, supplies, services, architectural services, construction related services, leases of real property, or construction.

8. AFFIRMATION REGARDING COLLUSION

I FURTHER AFFIRM THAT:

Neither I, nor to the best of my knowledge, information, and belief, the Business, nor any of its officers, directors, members or partners, nor any of its employees, have in any way:

(1) Agreed, conspired, connived, or colluded to produce a deceptive show of competition in the compilation of the accompanying bid or offer that is being submitted;

(2) In any manner, directly or indirectly, entered into any agreement of any kind to fix the bid price or price proposal of the bidder or offeror or of any competitor, or otherwise take any action in restraint of free competitive bidding in connection with the contract for which the accompanying bid or offer is submitted;

(3) Colluded with anyone to obtain information concerning the bid that would give the Business an unfair advantage over others.

9. POLITICAL CONTRIBUTION DISCLOSURE AFFIRMATION

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 14- 101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, or at least \$200,000.00, shall file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of \$500 during defined reporting periods.

10. CERTIFICATION OF CORPORATION REGISTRATION AND TAX PAYMENT

I FURTHER AFFIRM THAT:

(1) The Business is a _____(State) (Corporation), (LLC), (Partnership), (Sole Proprietor/Individual), (Other:_____), that it **is** registered in accordance with the Corporations and Associations Article of the Annotated Code of Maryland, that it **is** in good standing in the State of Maryland, and that it **has** filed all of its annual reports, together with filing fees, with the Maryland State Department of Assessments and Taxation, and that the name and address of its resident agent filed with the State Department of Assessments and Taxation is:

Name: _____

Address: _____

(If none, so state)

(2) Except as validly contested, the Business has paid, or has arranged for payment of, all taxes due the State of Maryland and Baltimore County, and has filed all required returns and reports with the Comptroller of the Treasury, the State Department of Assessments and Taxation, and the Employment Security Administration, as applicable, and will have paid all withholding taxes due the State of Maryland prior to final settlement.

11. CONTINGENT FEES

I FURTHER AFFIRM THAT:

The Business has not employed or retained any person, partnership, corporation, or other entity, other than a bona fide employee or agent working for the Business, to solicit or secure the Contract, and that the Business has not paid or agreed to pay any person, partnership, corporation, or other entity, other than a bona fide employee or agent, any fee or other consideration contingent on the making of the Contract.

12. NONDISCRIMINATION IN EMPLOYMENT STATEMENT

I FURTHER AFFIRM THAT:

During the performance of any contract awarded of which this affidavit is a part:

(1) The Business will not discriminate against any employee or applicant for employment because of race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. The Business will take affirmative action to ensure that applicants are employed, and that employees are treated during employment, without regard to their race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test. Such action shall include, but not be limited to the following: employment, promotion, upgrading, demotion or transfer, rates of pay or other forms of compensation; and selection for training, including apprenticeship. The Business agrees to post in conspicuous places, available to employees and applicants for employment, notices to be provided by the owner setting forth provisions of this nondiscrimination clause.

(2) The Business will, in all solicitations or advertisements for employees placed by or on behalf of the Business, state that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, national origin, marital status, sexual orientation, genetic information, or disability unrelated in nature and extent so as to reasonably preclude the performance of the employment, or because of the individual's refusal to submit to a genetic test or make available the results of a genetic test.

(3) The Business shall send to each labor union or representative of workers with which the Business has a collective bargaining agreement or other contract or understanding, a notice, to be provided by the owner, advising the said labor union or workers' representative of these commitments, and shall post copies of the notice in conspicuous places available to employees and applicants for employment.

(4) The Business shall furnish, if requested by the County, a compliance report concerning our employment practices and policies in order for the County to ascertain compliance with the special provisions of this affidavit concerning nondiscrimination in employment.

(5) In the event of the Business's noncompliance with the nondiscrimination clause of this affidavit, the contract may be canceled, terminated, or suspended in whole or in part, and the Business may be declared ineligible for further County work.

(6) The Business shall include the special provisions outlined herein pertaining to nondiscrimination in employment in every subcontract, so that such nondiscrimination in employment provisions shall be binding on each subcontractor or vendor.

13. FOREIGN CONTRACTS

I FURTHER AFFIRM THAT:

The Business affirms that it is aware of, and will comply with, the provisions of Sections 10-2-110 Article 10. Finance, Title 2 – Purchasing, Baltimore County Code 2003, which requires that prior to the award of a contract for services under the provisions of this title, and during the entire term of a contract award, the bidder or vendor shall disclose to the County whether any services covered by the bid or contract, including any subcontracted services, will be performed outside the United States. The disclosure shall be made to the Office of Budget and Finance, Purchasing Bureau.

14. MINORITY BUSINESS ENTERPRISE AND FEMALE CONTRACTORS

THIS BUSINESS INTENDS to affirmatively seek out and consider minority business enterprises to participate in this contract as subcontractors and/or suppliers of materials and services.

THE UNDERSIGNED UNDERSTANDS AND AGREES: that any and all subcontracting of supplies and services in connection with this contract, whether undertaken before or after award of contract, will be in accordance with the Minority Business Enterprise and Female Contractor requirement included in the Bid Proposal package and incorporated herein as if fully set forth; and

THE UNDERSIGNED ALSO UNDERSTANDS AND AGREES that no subcontracting will be approved until Baltimore County has reviewed and approved the affirmative actions taken by this firm.

15. REQUIREMENTS FOR EXECUTING AFFIDAVIT & PROPOSAL

The Affidavit must be signed in ink in order for the bid to be accepted and that the Proposal must be typewritten or filled out in ink.

THE UNDERSIGNED ALSO UNDERSTANDS that:

Proposals submitted by an INDIVIDUAL must be signed by an individual.

Proposals submitted by a PARTNERSHIP must be signed by the partner who is legally authorized authority to bind the partnership. Attach a copy of the Partnership Agreement and a duly certified resolution evidencing the authority of the partner so signing on behalf of the partnership.

Proposals submitted by a CORPORATION must be signed by a legally authorized officer of the corporation and attested to by the Corporate Secretary. Attach a copy of the Articles of Incorporation, By-Laws and a duly certified Board Resolution evidencing the authority of the officer so signing on behalf of the corporation.

Proposals submitted by a LIMITED LIABILITY COMPANY must be signed by a legally authorized member of the company and attested to. Attach a copy of the Operating Agreement, Articles of Organization and a duly certified resolution evidencing the authority of the member so signing on behalf of the limited liability company.

NOTE: The contractor may file with the County a list of the names of those officers, partners or members, as applicable, having legal authority to execute documents on behalf of and legally bind the contractor, duly certified, as applicable and legally required, together with the aforesaid corporate documents, which shall remain in full force and effect until such time as the County Department of Public Works and Transportation, Construction Contract Administration is advised in writing to the contrary.

16. ACKNOWLEDGMENT

I ACKNOWLEDGE THAT this Affidavit is to be furnished to the County and may be distributed to units of (1) Baltimore County; (2) the State of Maryland; (3) other counties or political subdivisions of the State of Maryland; (4) other states; and (5) the federal government. I further acknowledge that this Affidavit is subject to applicable laws of the United States and the State of Maryland, both criminal and civil, and that nothing in this Affidavit or any contract resulting from the submission of this bid or proposal shall be construed to supersede, amend, modify or waive, on behalf of Baltimore County, or the State of Maryland or any unit of the State of Maryland having jurisdiction, the exercise of any statutory right or remedy conferred by the Constitution and the laws of Maryland with respect to any misrepresentation made or any violation of the obligations, terms and covenants undertaken by the Business with respect to (a) this Affidavit, (b) the contract, and (3) other Affidavits comprising part of the contract.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

WITNESS/ATTEST:

_____	By: _____
Date: _____	Name: _____
	Title: _____
	(Authorized Representative and Affiant)

BID BOND

Principal

Business Address of Principal

Surety

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Five Percent of Bid Amount \$ _____ 5% of Bid

Penal Sum of Bond [shall be determined pursuant to latest revised Specification / G.P. 2.07 (2000 Ed.)]

Baltimore County Detention Center Lobby Renovations

25122 PO0

Contract Number/Proposal Item Number

KNOW ALL MEN BY THESE PRESENTS, that we, the Principal, above named, and Surety, above named, and authorized to do business in the State of Maryland, are held and firmly bound unto the Obligee, above named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION is such that if the aforesaid Principal is the apparent low bidder and complies with all specified matters required before award or if the aforesaid Principal is awarded the contract, the said Principal will, within the time required, execute and deliver to the Obligee a formal contract and good and sufficient payment and performance bonds in the form provided by the Obligee, then, this obligation to be void; otherwise the Principal and Surety will, upon demand, pay unto the Obligee the entire Penal Sum of this Bid Bond as liquidated damages.

THE SURETY FURTHER GUARANTEES No Proposal will be considered unless accompanied by a guaranty of the amount specified in the Proposal in the form of either a certified check, bank cashier's check or a Bid Bond on the form provided therein or an exact facsimile thereof. The Bid Bond must be executed by a Surety that is, as of the date of the Bid: (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. The Bid Bond must guaranty payment to the County of liquidated damages as follows: (a) if only one Bid is received, the guaranteed payment shall be five (5%) percent of the Bidder's Bid amount, (b) if two or more Bids are received, the guaranteed payment shall be the difference between the Bidder's Bid amount and the next lowest Bid amount, subject to the limitation that the guaranteed payment not be greater than five (5%) percent of the Bidder's Bid amount. This Bid Bond is required in case the successful Bidder, after issuance of notice of Award, fails to comply, timely and completely, with each of the requirements set forth under Section GP-3.04.

Signed and sealed _____
Date

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

In Presence of:

Individual Principal

Witness: _____

as to: _____ (SEAL)

Print Name: _____

Print Name: _____

Corporate Principal

In Presence of:

(Name of Corporation)

Witness: _____

By: _____

Print Name: _____

Print Name: _____ (SEAL)

Title: _____

Surety

(Name of Surety)

Business Address: _____

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

**BALTIMORE COUNTY
PREVAILING WAGE AND LOCAL HIRING**

AFFIDAVIT

(Project Name) _____

Proposal No.: _____

Project No.: _____

On behalf of _____, I do solemnly declare and affirm,
(Contractor)
under penalty of perjury, that to the best of my knowledge, information, and belief:

1. I have submitted all documentation in accordance with Baltimore County Code § 10-2- 506 and § 10-2-507 regarding the prevailing wage and local hiring laws and requirements of the prevailing wage guidelines located at ([Prevailing Wage and Local Hire Laws](#)), and acknowledge that I have read and agree to all provisions of said law, as amended, and have a continuing obligation to be compliant with the law and any changes to the law.

2. I shall not knowingly provide any false information relating to payroll documentation and/or hiring of local employees for capital improvement contracts that are subject to the prevailing wage and/or local hiring laws of Baltimore County. I further attest and certify that all documentation relating to the same will be accurate and complete and will remain accurate and complete on an ongoing basis, and will reflect the payroll and/or local hiring status of contractors, subcontractors, apprentices, and independent contractors performing work for the Contract (contract number _____). I acknowledge that I have been informed and am aware of the foregoing requirements and that I am authorized to make this certification on behalf of myself and all subcontractors and parties performing work pursuant to this Contract.

3. I certify and attest that I am an officer or agent of the Contractor or subcontractor who supervises the payment of employees. I understand and agree that all documentation related to prevailing wages and/or local hiring required by law shall be submitted to Baltimore County's Prevailing Wage Administrator or designee before any surety is released or final payment due under the terms of the Contract is made.

4. I further certify and attest that I will have personal knowledge of the wages paid to all employees of _____ for work performed on the Contract and of all of the hours worked, and that I am an authorized agent of the Contractor and assume responsibility for my actions.

5. I further certify and attest that _____ will comply with prevailing wage rates set by the State of Maryland as the same apply to the Contract and are a part of the bid documents and Contract, and that _____ will comply with applicable local hiring requirements.

6. I attest and certify that, if the Contract is subject to the local hiring requirement under §10-2-507 of the Baltimore County Code, _____ will make best efforts to ensure that residents of Baltimore County constitute at least 51% of the new hires made for the Contract, subject to all exceptions allowable by law.

7. I certify and attest that, if the Contract is subject to prevailing wage requirements, no rebates or deductions will be made, directly or indirectly, from any wages paid in connection with the Contract, other than those provided for by law.

8. I certify and attest that, if awarded the Contract and if the Contract is subject to prevailing wage law, I will submit certified payroll to the County through its electronic compliance system or as instructed by the Prevailing Wage and Local Hire Unit.

9. I certify that if awarded the Contract, I will provide a list of subcontractors who will participate as a beneficiary of this project to the agency and the Prevailing Wage and Local Hire Unit at PrevailingWage@baltimorecountymd.gov.

10. I understand that no funds will be dispersed by the County until an Employment Analysis has been issued to the Prevailing Wage and Local Hire Unit in compliance with the local hire law. The Employment Analysis will include how many jobs will be required to complete the project; how many current employees are available to complete the project, and how many of those jobs will require new hires.

Contractor/Bidder/Offeror

By

Printed Name

Printed Title

Date

Phone

License Number

Business Email

BALTIMORE COUNTY, MARYLAND

Prevailing Wage and Local Hiring Contract Requirements and Policies

The Contractor and all Subcontractors must comply with the Prevailing Wage and Local Hiring Laws, contained in Baltimore County Code § 10-2-506 and § 10-2-507, respectively, as amended. Prevailing wage means the wage rate paid by employers that is determined by a governmental authority, based upon a particular geographic area, for a given class of labor and type of project. The County will use the prevailing wage established by the State of Maryland (the "State") Department of Labor for state funded construction contracts in the County at the time of award. These rates include the basic hourly rate and fringe benefits. Apprentices must be paid at least the rate that the State's Apprenticeship and Training Council sets for an apprentice in the trade involved, based on a percentage of the prevailing wage rate in that trade. Any Contractor that is subject to the prevailing wage or local hiring law will be required to agree to the below provisions:

For the purposes of these requirements, an employee means an apprentice, laborer or mechanic employed by a contractor or subcontractor on a capital improvement project with a value of over \$300,000 or a County-subsidized capital project with a value over \$5,000,000.

Capital Improvement Project does not include blanket order or open-end agreements, capital improvement projects subject to a federal or state prevailing wage law, awarded without competition; with another governmental entity; to the extent the contractor is precluded from compliance by the terms of any federal or state law, contract or grant; entered into pursuant to Baltimore County Code § 10-2-310(e); entered into as a joint or cooperative purchase; or entered into as an emergency purchase.

The purpose of a prevailing wage is to ensure that contractors institute local hiring practices for Capital Improvement contracts and Capital Projects under certain circumstances as required by law, and that the Contractor's employees who work on capital improvement contracts are paid the going rate for their services. The prevailing wage rates are established by the State of Maryland Department of Labor and apply to all of the Contractor's employees and any and all Subcontractors. The Contractor and all Subcontractors must comply with all of the requirements of the Prevailing Wage Law including, but not limited to, the following:

1. Pay employees the prescribed rate as annually established by the State's Department of Labor; the prevailing wage rates in effect on the date a solicitation is issued and will apply throughout the term of a contract resulting from that solicitation. Contractor or subcontractors may NOT split or subdivide a capital improvement contract, pay an employee through a third party, treat an employee as a subcontractor or independent contractor to avoid any requirement of the County's prevailing wage law; or employ an individual classified as a helper or trainee to perform direct and measurable work on a capital improvement contract.

2. Pay employees at a rate equal to or more than the prevailing wage rate currently in effect for the type of work performed.

3. Pay employees overtime for work (I) more than eight hours in any single calendar day; (II) more than 40 hours in a work week; or (III) on a Sunday or a legal holiday.

4. Classify employees in their proper work classification in conformance with the schedule established by the State's Department of Labor.

5. May only make fair and reasonable deductions that are (a) required by law; (b) authorized in a written agreement between an employee and contractor or subcontractor signed at the beginning of employment (any deductions taken from employee paychecks including healthcare, pension, 401K, IRA, etc., child/spouse support, or tax levies); and submitted by the contractor or subcontractor to the Director of the County's Prevailing Wage Program; or required or allowed by a collective bargaining agreement between a bona fide labor organization and a contractor or subcontractor.

Electronically submit a certified copy of payroll records through the County's designated certified payroll and compliance system within 14 days after the end of payroll week ending date, to verify that Prevailing Wage rates have been paid to employees.

6. Backup documentation may be required upon demand from the County to be submitted for all 3rd party benefits being claimed, to include, but not limited to: *one month's healthcare transmittal showing employee name and amount company pays on their behalf, company vacation/sick policy, etc. or if Union, a Union transmittal for one month in which work has been performed.*

7. Retain records for a period of five (5) years after the work is completed and permit the Director of the County Prevailing Wage Program, or his/her designee, to inspect the payroll records at a reasonable time and as often as necessary.

8. Payroll records shall contain a statement signed by the contractor or subcontractor (including tiered subcontractors) certifying that the payroll records are complete and correct; the wage rates are not less than required by the Prevailing Wage Law; and the rate of pay and classification for each employee accurately reflects the work the employee performed.

9. All payroll records shall include the name, address, telephone number and email address of the contractor or subcontractor; the name and location of the job; and each employee's name, current address, unless previously reported; specific work classification; daily basic time and overtime hours; total basic time and overtime hours for the payroll period; rate of pay; fringe benefits by type and amount; and gross wages, and any deductions taken from employees' paychecks including, but not limited to, healthcare, pension/401K/IRA. Late submission of copies of any payroll records may be deemed deficient by the County until the required records are provided, and the County may postpone processing payments due under the Contract or under an agreement to finance the Contract.

10. Submit to random or regular audits and investigation of any complaint of a violation of the County's Prevailing Wage and Local Hiring Laws and requirements.
11. Make best efforts to fill at least 51% of new jobs required to complete the capital improvement contract or capital project with Baltimore County residents.
12. Submit monthly reports to the Director of the County's Prevailing Wage Unit relating to local hiring with respect to capital improvement contracts over \$300,00 or County-subsidized capital construction projects receiving assistance over \$5,000,000, that includes (a) the number of new hires needed for the contract or project, (b) the number of County residents hired during the reporting period, (c) the total number of all employees hired during the contract period, (d) best efforts made to fill open positions with County residents, and (e) 5) for new hires: name, last four (4) digits of the social security number, job title, hire date, address and referral source.
13. Agree that any and all disputes will be handled as set forth in the County's Prevailing Wage and Local Hire as a condition of award.
14. In the event the County determines that a provision of the Prevailing Wage and/or Local Hire Law has been violated, the County shall issue a written decision, including appropriate sanctions, and may withhold payment due the Contractor in an amount sufficient to pay each employee of the Contractor or any subcontractors the full amount of wages due under the Prevailing Wage Law, and an amount sufficient to satisfy a liability of the Contractor for liquidated damages as provided under the Prevailing Wage Law, pending a final decision on the violation by the County. The Contractor may appeal a written decision of the Director of the County's Prevailing Wage Unit that the Contractor violated a provision of the Prevailing Wage and/or Local Hire Law, to the Office of Administrative Hearings ("OAH"), within ten (10) working days after receiving a copy of the decision. OAH will conduct a hearing upon the receipt of a timely appeal. If no appeal, the decision of the Director of the County's Prevailing Wage Unit or his/her designee becomes final. A Contractor who is found to have violated the provisions of the Prevailing Wage or Local Hiring Laws intentionally, may not be awarded a County contract or work on any County project for a period of one year from the date of the OAH determination.
15. May not discharge, or otherwise retaliate against, an employee for asserting any right under the Prevailing Wage Law or for filing a complaint of a violation;
16. An aggrieved employee is a third-party beneficiary of the Contract and may by civil action recover the difference between the prevailing wage for the type of work performed and the amount actually received, with interest and a reasonable attorney's fee.
17. Each Contract subject to the Prevailing Wage and Local Hire Laws may specify the payment of liquidated damages to the County by the Contractor for any noncompliance with the Prevailing Wage and Local Law. Liquidated damages are:
 - a. \$10 for each calendar day that the payroll records are late (payrolls are to be submitted no later than 14 days after the week ending date shown on Certified Payroll Record CPR);
 - \$20 for each day that an employee is misclassified and/or paid less than the prevailing

wage rate; and a civil penalty of \$50 per violation of the requirement to post the prevailing wage rates at the work site.

- b. \$50 per month for each month the Local Hire report is not submitted by the last day of the existing month due.

These liquidated damages are solely related to prevailing wage and local hiring compliance and do not negate any other remedies available or set forth in the Contract, including delay damages or actual damages. These remedies are separate from, in addition to, and not in lieu of, any remedies available and set forth in the Contract, or at law, for other breaches or defaults under the Contract.

- 18. Where the initial Contract Sum is \$300,000 or below, but it is subsequently increased and exceeds \$300,000 due to an approved Contract Modification, the amount of any such Contract Modification that causes the Contract Sum to exceed \$300,000 is subject to the Prevailing Wage and Local Hiring Laws.
- 19. The Contractor and all subcontractors must post a clearly legible statement of each prevailing wage rate in a prominent and easily accessible place at the Work Site during the entire time Work is being performed, in English and any other language that is primarily spoken by the employees, at the Work Site.
- 20. A contract may include the actual cost of health and dental insurance, pension or retirement plan, paid time off such as vacation or sick days and life insurance. In calculating the cost per hour, divide the annual cost of benefits by 2,080 hours for each employee. Other benefits such as the use of a company vehicle, cell phones, lodging reimbursement, company owned tools **may not be credited towards the fringe benefit amount.**
- 21. All apprentices must be registered with the Maryland Apprenticeship and Training Council, V.A., or US DOL as well as be currently enrolled in, and attending appropriate classes, to which is considered “actively enrolled”. Only actively enrolled apprentices may be employed on the project at the apprentice prevailing wage rate.

Classification	Modification Reason	Basic Hourly Rate	Borrowed From	Fringe Benefit Payment
BALANCING TECHNICIAN	AD	\$47.92		\$24.44
BRICKLAYER	AD	\$37.50		\$14.78
CARPENTER	AD	\$34.41		\$14.49
CARPENTER - SHORING SCAFFOLD BUILDER	AD	\$34.41		\$14.49
CARPET LAYER	AD	\$34.12		\$14.86
CEMENT MASON	AD	\$25.00	510	\$1.94
COMMUNICATION INSTALLER TECHNICIAN	AD	\$36.37		\$12.89
DRYWALL - SPACKLING, TAPING, & FINISHING	AD	\$34.41		\$14.49
ELECTRICIAN	AD	\$47.13		\$21.94
ELEVATOR MECHANIC	AD	\$56.36		\$45.50
FIRESTOPPER	AD	\$29.81		\$10.08
GLAZIER	AD	\$35.60		\$14.41
INSULATION WORKER	AD	\$40.02		\$19.92
IRONWORKER - FENCE ERECTOR	AD	\$40.02		\$19.92
IRONWORKER - ORNAMENTAL	AD	\$31.17	510	\$24.38
IRONWORKER - REINFORCING	AD	\$29.20	510	\$23.57
IRONWORKER - STRUCTURAL	AD	\$33.12		\$25.63
LABORER - AIR TOOL OPERATOR	AD	\$24.46		\$9.69
LABORER - ASPHALT PAVER	AD	\$24.46		\$9.69
LABORER - ASPHALT RAKER	AD	\$22.63		\$4.88
LABORER - BLASTER - DYNAMITE	AD	\$24.46		\$9.69
LABORER - BURNER	AD	\$24.46		\$9.69
LABORER - COMMON	AD	\$22.63		\$4.88
LABORER - CONCRETE PUDDLER	AD	\$22.63		\$4.88
LABORER - CONCRETE SURFACER	AD	\$24.46		\$9.69
LABORER - CONCRETE TENDER	AD	\$22.63		\$4.88
LABORER - CONCRETE VIBRATOR	AD	\$22.63		\$4.88
LABORER - DENSITY GAUGE	AD	\$22.63		\$4.88
LABORER - FIREPROOFER - MIXER	AD	\$22.63		\$4.88
LABORER - FLAGGER	AD	\$22.63		\$4.88
LABORER - GRADE CHECKER	AD	\$22.63		\$4.88
LABORER - HAND ROLLER	AD	\$22.63		\$4.88
LABORER - HAZARDOUS MATERIAL HANDLER	AD	\$24.46		\$9.69
LABORER - JACKHAMMER	AD	\$22.63		\$4.88
LABORER - LANDSCAPING	AD	\$22.63		\$4.88
LABORER - LAYOUT	AD	\$22.63		\$4.88
LABORER - LUTEMAN	AD	\$22.63		\$4.88
LABORER - MASON TENDER	AD	\$24.46		\$9.69
LABORER - MORTAR MIXER	AD	\$22.63		\$4.88
LABORER - PIPELAYER	AD	\$24.46		\$9.69
LABORER - PLASTERER - HANDLER	AD	\$22.63		\$4.88
LABORER - SCAFFOLD BUILDER	AD	\$24.46		\$9.69
LABORER - TAMPER	AD	\$22.63		\$4.88
MECHANICAL SYSTEMS SERVICE TECH - ELECTRICAL SYSTEMS	AD	\$46.21	510	\$24.90

MECHANICAL SYSTEMS SERVICE TECH-HVAC SYSTEMS	AD	\$46.21		\$24.90
MECHANICAL SYSTEMS SERVICE TECH-PLUMBING SYSTEMS	AD	\$46.21		\$24.90
MECHANICAL SYSTEMS SERVICE TECH - REFRIGERATION SYSTEMS	AD	\$52.27	003	\$24.58
MILLWRIGHT	AD	\$38.61		\$17.21
PAINTER	AD	\$28.55		\$11.87
PAINTER-INDUSTRIAL	AD	\$35.55		\$15.28
PILEDRIIVER	AD	\$36.60		\$16.78
PLUMBER	AD	\$46.21		\$24.90
POWER EQUIPMENT OPERATOR - BACKHOE	AD	\$33.00	510	\$13.55
POWER EQUIPMENT OPERATOR - BROOM / SWEEPER	AD	\$32.23	510	\$14.62
POWER EQUIPMENT OPERATOR - BULLDOZER	AD	\$34.18		\$14.62
POWER EQUIPMENT OPERATOR - CONCRETE PUMP	AD	\$44.35		\$0.00
POWER EQUIPMENT OPERATOR - CRANE	AD	\$41.00		\$18.10
POWER EQUIPMENT OPERATOR - CRANE - TOWER	AD	\$41.00		\$18.10
POWER EQUIPMENT OPERATOR - DRILL - RIG	AD	\$33.16		\$14.15
POWER EQUIPMENT OPERATOR - EXCAVATOR	AD	\$34.18		\$14.62
POWER EQUIPMENT OPERATOR - FORKLIFT	AD	\$34.18		\$14.62
POWER EQUIPMENT OPERATOR - GRADALL	AD	\$34.00	510	\$13.55
POWER EQUIPMENT OPERATOR - GRADER	AD	\$34.18		\$14.62
POWER EQUIPMENT OPERATOR - GUARD RAIL POST DRIVER	AD	\$23.50		\$5.07
POWER EQUIPMENT OPERATOR - LOADER	AD	\$34.18		\$14.62
POWER EQUIPMENT OPERATOR - MECHANIC	AD	\$36.24		\$14.62
POWER EQUIPMENT OPERATOR - MILLING MACHINE	AD	\$30.58	510	\$13.55
POWER EQUIPMENT OPERATOR - PAVER	AD	\$32.10	510	\$13.55
POWER EQUIPMENT OPERATOR - ROLLER - ASPHALT	AD	\$32.10	510	\$13.55
POWER EQUIPMENT OPERATOR - ROLLER - EARTH	AD	\$28.60		\$14.62
POWER EQUIPMENT OPERATOR - SCREED	AD	\$30.00	510	\$11.80
POWER EQUIPMENT OPERATOR - SKID STEER (BOBCAT)	AD	\$32.23		\$14.62
POWER EQUIPMENT OPERATOR-VACUUM TRUCK	AD	\$37.50		\$14.85
RESILIENT FLOOR	AD	\$34.12		\$14.86
SHEETMETAL WORKER (INCLUDING METAL ROOFING)	AD	\$47.92		\$24.44
SPRINKLERFITTER	AD	\$42.32	510	\$26.05
SPRINKLERFITTER/PIPEFITTER	AD	\$46.21		\$24.90
STONE MASON	AD	\$44.30	510	\$21.22
TILE & TERRAZZO FINISHER	AD	\$28.09		\$12.59
TILE & TERRAZZO MECHANIC	AD	\$33.41		\$14.24
TRUCK DRIVER - DUMP	AD	\$17.64	510	\$1.92
TRUCK DRIVER - FLATBED	AD	\$20.94		\$7.63
TRUCK DRIVER - LOWBOY	AD	\$29.68	510	\$10.51
TRUCK DRIVER - TACK/TAR TRUCK	AD	\$27.35	510	\$8.97

BALTIMORE COUNTY, MARYLAND
USE OF MINORITY BUSINESS ENTERPRISES AND WOMEN'S BUSINESS ENTERPRISES
IN
COUNTY CONTRACTS
MWBE Plan Package



Division of Diversity, Equity and Inclusion
The Jefferson Building
105 West Chesapeake Avenue
Towson, Maryland 21204
410-887-3407

www.baltimorecountymd.gov/go/mwbe



PROSPECTIVE BIDDERS/OFFERORS

Baltimore County Executive Order 2022-005 Use of Minority Business Enterprises and Women's Business Enterprises states:

SECTION 6. BID REQUIREMENTS.

- (A)(1) *All bidders shall submit a list of all subcontractors contacted in preparation of their bid package or proposal.*
(2) *The list shall include the service to be performed, bid amount, and the race/ethnicity/gender of the business owner(s).*
(B)(1) *All bidders shall submit a list of all subcontractors to be used on a county contract in the bid package.*
(2) *This list shall include all subcontractors (both MWBE and non-MWBE) used, the service to be performed, the total amount to be paid, and the race/ethnicity/gender of the owner.*

If the solicitation includes a MWBE **subcontracting** goal, you **MUST** demonstrate “**Good Faith**” **effort** either by:

1. Complete and sign FORM A, FORM B (to include FORM B-Prime if MWBE Prime wishes to count towards the goal) and FORM C **listing all subcontractors** with the initial bid submission.
 - a. *All Forms must be completed and signed. However, FORM C **MUST** be completed and signed by both the prime and the MWBE subcontractor.*
- OR**
2. If you are unable to meet any portion of the goal, you **MUST** do one of the following:
 - a. If you are requesting a **partial waiver**, complete and sign FORM A with initial bid submission. FORM B (to include FORM B-Prime if MWBE Prime wishes to count towards the goal) and FORM C (**listing all subcontractors**). In addition, complete, sign and submit FORM D and FORM E **accompanied with all supporting documentation** for the portion of the goal that will not be achieved as specified on FORM A.
 - b. If you are requesting a **full waiver**, complete and sign FORM A indicating your intent to request a full waiver **accompanied with a completed and signed FORM C listing all subcontractors**, FORM D and FORM E **accompanied with all supporting documentation. This MUST be submitted with the initial bid as specified on FORM A.**
 - c. *All Forms must be completed and signed. FORM C and FORM D **MUST** be completed and properly signed by both the Prime AND the MWBE subcontractor(s).*

NOTE: The MWBE **subcontracting** goal applies to **ALL** prime/general contractors including certified and non-certified minority and women owned firms. **However, a Minority-owned or a Women-owned prime may self-perform up to 50% of MWBE subcontracting goal set in the solicitation. The MWBE primes that wish to count towards the goal must list themselves on all appropriate forms.**

12/2023

BALTIMORE COUNTY, MARYLAND

MWBE PARTICIPATION SUMMARY

Executive Order: Minority Business Enterprises and Women Business Enterprises (MWBE) shall have the maximum opportunity to participate in the performance of contracts financed in whole, or in certain circumstances, in part with County funds. Accordingly, on December 6, 2022, the County Executive adopted the EXECUTIVE ORDER No. 2022-005 addressing MWBE participation in County contracts. The December 6, 2022 Executive Order may be found on the Baltimore County website at www.baltimorecountymd.gov/go/mwbe.

Each Contract: The County shall establish a minimum MWBE participation amount for each contract, as applicable.

Bidder/Offeror Responsibility: The bidder/offeror shall ensure that MWBE participation occurs in accordance with the contract requirements and the County Executive's Executive Order. All bidder/offerors shall ensure that MWBE have the maximum opportunity to compete for and perform County contracts, as applicable. Baltimore County, Maryland, and/or its bidder/offerors and contractors shall not discriminate on the basis of race, color, national origin, disability or sex in the award and performance of any County contract.

Mobilization Payments: For subcontractors, project start-up costs can also be significant. A subcontractor that has limited resources and access to credit may find that start-up expenses inhibit its ability to bid County contracts. Under circumstances where mobilization payments are approved for the prime contractor, the subcontractor should be paid an amount equal to their participation percentage no later than five (5) business days before they are required to mobilize to perform the contracted work.

Mobilization costs represent pre-contract costs incurred by a contractor to prepare a job site before the actual commencement of the contract. These costs can include movement of personnel and equipment to the project site and for the establishment of the Contractor's offices, buildings, and other facilities necessary to begin work.

APPROVED MWBE LISTINGS

Published compilations of approved and certified MWBE, contractors, subcontractors, material suppliers, etc. include:

DIRECTORY OF MINORITY BUSINESS ENTERPRISE (MDOT):

<https://marylandmdbe.mdbecert.com>

MINORITY BUSINESS DIRECTORY OF THE CITY OF BALTIMORE:

<https://baltimorecity.diversitycompliance.com>

BIDDER/OFFEROR'S ACTIONS

Seeking Firms:

The bidder/offeror will seek commitments by subcontract or otherwise from MWBE firms for supplies and/or services, any combined value of which equals or exceeds the required percentage of MWBE participation goal for the County contract. However a MWBE Prime that affirms its MWBE status on the Minority and/or Women Prime Participation Affidavit may count up to 50% of the goal.

Expenditures for Materials and Supplies:

A bidder/offeror may count toward its MWBE contract requirements all expenditures for materials and supplies obtained from MWBE suppliers and manufacturers, provided that the MWBE firm is furnishing and installing the materials and is certified to perform these services. If the MWBE firm is only being used as a supplier, wholesaler and/or regular dealer or is not certified to install the supplies/materials, for purposes of achieving the MWBE participation goal, you may only count sixty percent (60%) of the value of the subcontract for these supplies/products (60% Rule). To apply the 60% Rule, first divide the amount of the subcontract for these supplies/products only (not installation) by the total Contract value. Then, multiply the result by sixty percent (60%) and insert the percentage in the Percent of Total Contract field of Form B Subcontractor Participation Schedule.

BALTIMORE COUNTY, MARYLAND **MWBE PARTICIPATION SUMMARY**

Information to be supplied: All bidder/offers shall submit the following information to the County at the time of bid submission:

1. The name of an employee designated as the bidder/offers's liaison to the County's Minority Business Enterprise Office.
2. The following forms shall be completed and submitted:
 - Certified MWBE Utilization and Fair Solicitation Affidavit (**Form A**); from among those names appearing in the Approved MWBE Listings (excepting Federal Highway Administration projects, which exclusively require DBE approved and certified by the Maryland Department of Transportation MBE Advisory Committee);
 - A Subcontractor Participation Schedule (**Form B**) completed by the prime contractor for each MWBE listed on the Form.
 - A MWBE Prime Participation Schedule (Form B-Prime) completed by a MWBE prime contractor if the firm wishes to self-perform up to 50% of the MBE/WBE goal.
 - A MWBE Disclosure and Participation Statement (**Form C**) completed and signed by the prime contractor and MWBE firm for each MWBE listed on the Form. Form C **must match** what is stated on Form B.
 - If applicable, MWBE Subcontractor Unavailable Certificate (**Form D**) completed and signed by the prime contractor and MWBE for each MWBE listed on the Form.
3. If applicable, MWBE Outreach Efforts - Compliance Statement (**Form E**) completed and signed by the Bidder/Offers. The prime shall submit a list of all subcontractors.
4. For DPW contracts, if the bidder/offers intends to fulfill the MWBE requirements by use of a joint venture, he/she must submit a Joint Venture Disclosure Affidavit (**Form D-EEO-006-A** and **B**) showing the extent of MWBE participation. If a bidder/offers intends to use a MWBE joint venture as a subcontractor to meet its MWBE requirements, the affidavit must be submitted through the bidder/offers by the proposed subcontractors and signed by all parties.
5. If the bidder/offers's proposed MWBE participation does not meet the MWBE contract requirements, information sufficient to demonstrate that the bidder/offers has made every effort to meet the requirements must be submitted. (See DETERMINATION OF BID RESPONSIVENESS hereafter)

RECORDS AND REPORTS

Returning Records: The bidder/offers must keep such records as are necessary to determine compliance with its MWBE utilization requirements:

1. The MWBE and non-minority contractors, type of work being performed, actual values of work and services.
2. Documentation of all correspondence, contacts, telephone calls, etc., to obtain MWBE services for the contract.
3. All prime contractors and MWBE sub-contractors are required to report monthly, by the 10th of each month, to the County through an online system called PRISM. If the contractor cannot submit his/her report on time, he/she will notify the County MWBE office and request additional time to submit the report. Failure of the contractor to report in a timely manner may result in a finding of noncompliance. The County in its sole discretion and/or upon written request may require additional reports regarding MWBE. In the event you are not able to enter your payments in PRISM, a spreadsheet is attached for your use. Please be sure to list the PO for each invoice/ payment reported and include in your submission any corresponding documentation (e.g. copies of invoices or cancelled checks).

Retaining Records: All MWBE records must be retained for 3 years following the expiration or any earlier termination of the contract and shall be available for inspection and photocopying by the County.

Investigation and Notification: Whenever the County believes the bidder/offers, contractor, or any subcontractor may not be operating in compliance with the MWBE requirements, the County may, in its sole discretion, conduct an investigation. If the County finds the bidder/offers, contractor, or any subcontractor is not in compliance with the MWBE requirements, the County may exercise any and all rights and remedies available to the County, under the contract, at law or equity, as deemed applicable and appropriate by the County in its sole discretion.

BALTIMORE COUNTY, MARYLAND **MWBE PARTICIPATION SUMMARY**

DETERMINATION OF BID RESPONSIVENESS

Request for Deviation: If the bidder/offeror is unable to procure from MWBE firms (by subcontract or otherwise), supplies and services, any combined value of which equals the required percentage of the total value of the contract, the bidder/ offeror may request, in writing, a deviation or waiver of the contract requirements. To obtain such a waiver, the bidder/ offeror must submit the following information at the time bids are due:

1. The request for waiver request shall include (1) a signed unavailability statement (Form D) executed by all MBEs and WBEs that the bidder/offeror solicited for participation and (2) Outreach Efforts/Compliance Statement (Form E) that demonstrates the bidder/offeror's good faith efforts to comply with the contract requirements, including copies of solicitation documentation to all potential subcontractors:
2. Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder/offeror contacted each MWBE; and
3. Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.

Bid Rejection: The failure of any bidder/offeror (including the apparent low bidder/offeror) to provide a responsive MWBE Plan as required by the solicitation may result in the bidder/offeror being deemed non-responsive and the County's rejection of the bid.

Liquidated Damages If the County issues a notice of intent to awards contract to the apparent low bidder/offeror who provided a responsive MWBE Plan, but, if after said notice and before execution of Contract Documents, it is determined by the County that the apparent low bidder/offeror has failed to comply with the MWBE Plan, such failure may result in the recommendation by the appropriate Procurement Official to annul the award and forfeit the bidder/offeror's Proposal Guaranty to the County, not as a penalty, but as liquidated damages, it being acknowledged that actual damages will be difficult if not impossible to accurately measure. In addition, the County may proceed as it determines to be in its best interest, including but not limited to, the Notice of Award may be made to the next lowest responsive and responsible bidder/offeror or the work may be re-advertised.

Contract Breach: If, after execution of a County contract, the contractor becomes aware it may or will fail to fulfill the applicable MWBE requirements and/or may or will deviate from the contractor's bid response/contract terms, the contractor shall promptly advise the County of this in writing. Thereafter, the County will determine what action or remedy is appropriate on a case-by-case basis, in the County's sole discretion.

Approval Required for Changes: Any and all changes to the MWBE subcontractors or the type or amount of work to be performed by such subcontractors during the contract term must be mutually agreeable to the County and the contractor and shall be documented via a contract amendment, executed by legally authorized representatives of the County and the contractor.

Cooperation in Reviews: The bidder/offeror will cooperate with the County in any reviews of the contractor's procedures and practices with respect to MBE or WBE firms, which the County may from time to time conduct in its sole discretion.

Other: If the documents used to determine the contractor's efforts, achievement of, and/or the status of an MWBE requirement or fulfillment thereof contain false, misleading or misrepresented information, the contractor may be declared in breach of the contract and the County may take any and all actions and/or remedies available to the County under the contract, at law, or in equity. If an MWBE is disqualified by any public entity, including but not limited to, Baltimore City, the State or MDOT, at any time after award or during the term of the contract, the County may, in its sole discretion, require the prime contractor to promptly submit for County approval, the contractor's plans for fulfilling the required MWBE participation under the contract, and/or request such detail and additional information as the County, in its discretion deems appropriate.



PRIME CONTRACTOR MINORITY AND WOMEN PARTICIPATION AFFIDAVIT

A. AUTHORIZED REPRESENTATIVE

I HEREBY AFFIRM THAT:

I am the [title]_____ and the duly authorized representative of
[business]_____
_____ (the "Business") and that I possess the legal authority to make this
Affidavit on behalf of myself and the Business for which I am acting.

B. AFFIRMATION REGARDING MINORITY AND WOMEN PARTICIPATION

I FURTHER AFFIRM THAT:

I am aware that, pursuant to the December 6, 2022 Executive Order of Baltimore County, Maryland, the following words have the meanings indicated.

(A) "Minority Business Enterprise" or "MBE" means a business enterprise that is owned, operated and controlled by one or more minority group members (African American, Hispanic American, Asian American, or Native American) who have at least 51% ownership and in which the minority group members have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

(B) "Women's Business Enterprise" or "WBE" means a business enterprise that is owned, operated and controlled by one or more women who have at least 51% ownership and in which the women have operational and managerial control, interest in capital and earnings commensurate with their percentage of ownership.

____ The Prime is a MBE ☐ or WBE ☐

☐ Maryland State Department of Transportation (MDOT) # _____

☐ City of Baltimore # _____

☐ Name Other Jurisdiction: _____ # _____

☐ The ownership of the Noncertified MWBE business consists of _____ % minorities and _____ % women (for a total of _____ %), each of which has operational and managerial control, interest in capital and earnings commensurate with their percent ownership.

_____ % African American _____ % Hispanic American _____ % Women
_____ % Asian American _____ % Native American _____ % Disadvantaged (DBE)

____ The MWBE prime anticipates meeting up to 50% of the stated participation goal with its own workforce.

MWBE primes percentage must be stated on the MWBE PRIME PARTICIPATION SCHEDULE (FORM B-PRIME) to count towards the goal.

____ The prime anticipates ☐ does not anticipate ☐ utilizing subcontractors for _____ % of the work of the contract requirements, of which it anticipates _____ % will be MBEs and _____ % will be WBEs.

I DO SOLEMNLY DECLARE AND AFFIRM UNDER THE PENALTIES OF PERJURY THAT THE CONTENTS OF THIS AFFIDAVIT ARE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE, INFORMATION, AND BELIEF.

Date: _____

By: _____

(Authorized Representative and Affiant's Name and Title)

BALTIMORE COUNTY, MARYLAND
Certified MWBE Utilization and Fair Solicitation Affidavit
(FORM A)

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

* * * * *

I acknowledge the goal for solicitation #25122 PO0 is a minimum of 25 %. This goal must be met by any combination of the MWBE subcontractors. However, for instances where the Prime is counting up to 50% of the goal, the remaining goal balance must be met by any combination of the MWBE subcontractors.

- The goal breakdown is as follows:
 - % Minority/Women Prime
 - % for certified MBE-owned businesses and/or
 - % for certified WBE-owned businesses.

I have made a good-faith effort to achieve this MWBE solicitation requirement. If awarded the contract, I will comply with this MWBE contract requirement and will continue to use my best efforts to increase MWBE participation during the contract term.

PLEASE CHECK ONE BOX (EITHER 1, 2, OR 3)

1 ☐ Prime has met the MWBE contract requirements for this solicitation and contract. I submit the Subcontractor Participation Form B and Form C, along with this Affidavit, which details how the Prime will achieve the contract requirements. Submit a complete list of all additional subcontractors

Or

2 ☐ After having made a good-faith effort to achieve the MWBE requirements, the Prime can only achieve partial success. I submit the Subcontractor Participation Form B, Form C, Form D and Form E along with this Affidavit, which details how the Prime will partially achieve the contract requirements. Submit a complete list of all additional subcontractors

I request a partial waiver and will meet the following MWBE participation goals:

- Partial waiver of MWBE subcontract participation:
 - % Minority/Women Prime
 - % for certified MBE-owned businesses and/or
 - % for certified WBE-owned businesses.

Or

3 ☐ After having made a good faith effort to achieve the MWBE requirements for this contract, the Prime is unable to achieve the requirements and/or sub requirements for this contract. I submit the MWBE Participation Form D and Form E, along with this Affidavit, which details the steps the Prime has taken in an attempt to achieve the contract requirements. Therefore, I request a full waiver.

IF YOU HAVE CHECKED BOX 2 OR 3, THE FOLLOWING IS APPLICABLE:

- 1) If a bidder is unable to comply with the goals established in a bid for a project, the bidder may submit a request for a waiver at the time of bid submission. However, occasions for granting waivers will be limited.

BALTIMORE COUNTY, MARYLAND
Certified MWBE Utilization and Fair Solicitation Affidavit
(FORM A)

- 2) The request for waiver shall include documentation that demonstrates the bidder's good faith efforts to comply with the goals, including:
- a. Signed unavailability statements from all MBEs and WBEs that the bidder solicited for participation; and
 - b. Copies of solicitation documentation to include the scope of services to be performed by the subcontractors accompanied with the following:
 - i. Emails, letters, facsimile transmittals and confirmations containing plans, specifications, and anticipated time schedule for portions of the work to be performed and meeting notes and agendas clearly identifying the certified MBE or WBE classification and dates that the bidder contacted each; and
 - ii. Telephone logs containing names, addresses, dates, telephone numbers, work to be performed, anticipated time schedule and classification of certified MBEs and WBEs contacted.
 - iii. Responses from MWBE firms contacted to fulfill the goal.

As I have checked Box 2 or 3 of this Affidavit, I understand I must submit the following supporting documentation with the bid:

- *Subcontractor Participation Schedule* (Form B)
- *MWBE Subcontractor Disclosure and Participation Statement* (Form C)
- *MWBE Subcontractors Unavailable Certificate* (Form D) (if applicable)
- *MWBE Outreach Efforts – Compliance Statement* (Form E) (if applicable)

I acknowledge that the MWBE subcontractors/suppliers listed on the *Subcontractor Participation Schedule* (Form B) will be used to accomplish the percentage of MWBE participation that the Prime shall achieve. A fully executed Form C must match Form B.

In the solicitation of subcontract quotations or offers, MWBE subcontractors were provided the same information and amount of time to respond, as were non-MWBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MWBE subcontractors at a competitive disadvantage to non-MWBE subcontractors.

I solemnly affirm under the penalties of perjury that this Affidavit is true to the best of my knowledge, information, and belief.

Bidder/Offeror Name

Phone Number

Address

Affiant Signature

Address (continued)

Printed Name & Title

E-mail address

Date

BALTIMORE COUNTY, MARYLAND
SUBCONTRACTOR PARTICIPATION
SCHEDULE (FORM B)

*This document must be completed and submitted with Bid/Proposal to
 Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Prime Name Bid/Proposal Name and Number 1. Subcontractor Name and Tax ID Telephone Number _____ Email Address _____ Select One: ☐ MBE ☐ WBE ☐ SBE ☐ N/A Provide if Applicable: ☐ MDOT ☐ Baltimore City # _____	Prime Address, Telephone Number and Email Project Location Base Bid \$ _____ Subcontractor Address Minority Status (If applicable): ☐ African American ☐ Asian American Pacific ☐ Asian American Sub-continent ☐ Supplier, Wholesaler and/or Regular Dealer - 60% Rule ☐ Female ☐ Native American ☐ Hispanic American
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount 2. Subcontractor Name and Tax ID Telephone Number _____ Email Address _____ Select One: MBE ☐ WBE ☐ SBE ☐ N/A ☐ Provide if Applicable: ☐ MDOT ☐ Baltimore City # _____	Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule) _____ % Subcontractor Address Minority Status (If applicable): ☐ African American ☐ Asian American Pacific ☐ Asian American Sub-continent ☐ Supplier, Wholesaler and/or Regular Dealer - 60% Rule ☐ Female ☐ Native American ☐ Hispanic American
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount 3. Subcontractor Name and Tax ID Telephone Number _____ Email Address _____ Select One: MBE ☐ WBE ☐ SBE ☐ N/A ☐ Provide if Applicable: ☐ MDOT ☐ Baltimore City # _____	Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule) _____ % Subcontractor Address Minority Status (If applicable): ☐ African American ☐ Asian American Pacific ☐ Asian American Sub-continent ☐ Supplier, Wholesaler and/or Regular Dealer - 60% Rule ☐ Female ☐ Native American ☐ Hispanic American
NAICS Code(s), Work to be Performed and Subcontract Dollar Amount Subcontractor Total Dollar Amount \$ _____	Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule) _____ % Total Subcontractor Percent of Entire Contract _____ %
Form Prepared by: Name/Date: _____ Title: _____ Email: _____	Reviewed and Accepted by Baltimore County Minority Business Enterprise Office Name _____ Title _____ Date _____

MBE or WBE Prime Participation Total	_____ %	\$ _____	
MBE Subcontracting Participation Total	_____ %	\$ _____	
WBE Subcontracting Participation	_____ %	\$ _____	
Total MWBE Participation	_____ %	\$ _____	
Total SBE Participation	_____ %	\$ _____	

BALTIMORE COUNTY, MARYLAND

**MWBE PRIME PARTICIPATION SCHEDULE
(Form B-Prime)**

PLEASE COMPLETE AND SUBMIT THIS FORM TO ATTEST EACH SPECIFIC ITEM OF WORK THAT YOU AS THE MWBE PRIME FIRM WILL PERFORM USING ITS OWN WORKFORCE PERTAINING TO THE PERCENTAGE STATED ON THE SUBCONTRACTOR PARTICIPATION SCHEDULE (FORM B) FOR PURPOSES OF MEETING THE MWBE PARTICIPATION GOALS.

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Provided that _____ (Prime Contractor's Name) with Certification Number _____ is awarded the County contract in conjunction with Solicitation No. _____, such MWBE Prime Contractor intends to count the distinct, clearly defined portion of the work of the contract that the MBE/WBE Prime Contractor performs with its own forces toward fulfilling **up to fifty-percent (50%) of the MWBE participation goal**, at least \$ _____ which equals to _____% of the Total Contract Amount for performing the following products/services for the Contract:

NAICS CODE	WORK ITEM, SPECIFICATION NUMBER, LINE ITEMS OR WORK CATEGORIES (IF APPLICABLE). FOR CONSTRUCTION PROJECTS, GENERAL CONDITIONS MUST BE LISTED SEPARATELY.	DESCRIPTION OF SPECIFIC PRODUCTS AND/OR SERVICES	VALUE OF THE WORK

MWBE PRIME CONTRACTOR

Signature of Representative: _____

Printed Name and Title: _____

Firm's Name: _____

Federal Identification Number: _____

Address: _____

Telephone: _____

Email Address: _____

Certified Yes ☐ No ☐

Certifying Jurisdiction _____

Date: _____

MWBE PRIME CONTRACTOR

Minority Status:

☐ African American

☐ Hispanic American

☐ Women

☐ Asian American

☐ Native American

Reviewed and Accepted by Baltimore County Minority Business Enterprise Office

Name _____

Title _____

Date _____

BALTIMORE COUNTY, MARYLAND
MWBE SUBCONTRACTOR DISCLOSURE AND PARTICIPATION STATEMENT
(FORM C)

**This document must be completed and submitted with Bid/Proposal to Baltimore County.*

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

NOTE: ANY INCONSISTENCY BETWEEN THIS FORM AND FORM B MWBE PARTICIPATION MAY RENDER A BID/PROPOSAL NON-RESPONSIVE AND THE COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

Contract Name, Bid/Proposal Number: _____

Prime Contractor Name: _____

Name of MWBE Subcontractor: _____

Subcontractor Contact Name, Title _____

Subcontractor Email Address _____

☐ MDOT ☐ Baltimore City

_____ Certification Number

☐ MBE ☐ WBE ☐ SBE ☐ N/A

1. NAICS Code(s), Work/Services to be performed by MWBE Subcontractor: _____

Percent of Total Contract (See instructions on Page 1 of the MWBE PARTICIPATION SUMMARY for 60% rule)

2. Subcontract Amount: \$ _____ or _____ % of the County contract cost.

3. Bonds - Amount and type required of Subcontractor if any: _____

4. MWBE Anticipated Commencement Date: _____ Completion Date: _____
Mobilization Cost Amount \$ _____

5. This is a MBE-Owned Business Firm: Yes _____ No _____

6. This is a WBE-Owned Business Firm: Yes _____ No _____

NOTE: If the Prime is notified that it will be awarded the above referenced contract, the undersigned MWBE subcontractor and Prime must enter into a subcontract for the work/service indicated above upon the Prime's execution of a contract for the above referenced project with Baltimore County, and provide a copy of the fully executed MWBE SUBCONTRACTOR PARTICIPATION NOTICE OF INTENT TO AWARD (FORM C-Subcontractor) accompanied with the anticipated Work Breakdown Schedule (providing the subcontractor's mobilization timeframe) to mwbe@baltimorecountymd.gov within 10 calendar days of receipt by the Prime of FORM C- Subcontractor from the County. The undersigned subcontractor is an MDOT or Baltimore City certified MWBE firm. The terms and conditions stated above are consistent with our agreements.

Signature of MWBE Subcontractor: _____ Date: _____

Prime's Printed Name and Title: _____ Email: _____

The terms and conditions stated above are consistent with our agreements.

Signature of Prime: _____ Date: _____

Revised 12/2024

BALTIMORE COUNTY, MARYLAND
MWBE –UNAVAILABILITY CERTIFICATE
(FORM D)

If applicable, this document must be completed and submitted with Bid/Proposal to Baltimore County.

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

1. It is hereby certified that the firm of _____
(Name of Minority firm)

located at _____
(Number) (Street)

(City) (State) (Zip)

was offered an opportunity to bid on the _____ contract.

2. The _____ (MWBE Firm), is either unavailable for the work/service or unable to prepare a bid for this project for the following reason(s):

Signature of Subcontractor MWBE Representative

Title

Date

MDOT/Baltimore City Certification #

Email Address #

Telephone #

3. PRIME'S SIGNATURE AND CERTIFICATION

I certify under oath that I contacted the Certified MWBE and they advised me that they are unavailable, unable to perform the work/services for the above-contract or failed to respond to repeated requests for a price proposal for the above-contract.

Signature of Prime

Title

Date

Rev 12/2024

BALTIMORE COUNTY, MARYLAND
MWBE - OUTREACH EFFORTS - COMPLIANCE STATEMENT
(FORM E)

****This document must be completed and submitted with Bid/Proposal to Baltimore County.***

NOTE: If you do not complete and submit this form with your bid or offer to the County, the County may, in its sole discretion, deem your bid or offer NON-RESPONSIVE and accordingly the COUNTY WILL NOT CONSIDER YOU FOR CONTRACT AWARD.

In conjunction with the bid or offer submitted in response to Solicitation Number _____, I state the following:

1. Bidder/Offeror identified opportunities to subcontract in these specific work categories:

2. Attached to this form are copies of the solicitation documentation in accordance with Section 6 (E) Bid Requirements of the Executive Order, used to solicit certified MWBEs for the subcontract opportunities accompanied with the signed MWBE Subcontractor Unavailability Certificate (Form D).

3. Bidder/Offeror made the following attempts to solicit MWBEs:

Signature – Bidder Offeror

Print or Type Name of Firm

Street Address

City State Zip Code

Date



JOHN A. OLSZEWSKI, JR.
County Executive

SEVETRA PEOPLES-BROWN
Executive Director
Chief of Diversity, Equity and Inclusion

To: Contractors/Consultants

From: Minority and Women Business Enterprise Office

Date: December 13, 2024

Subject: Compliance Reporting and Penalties

Baltimore County, Maryland (the "County") requires all Prime Contractors and all Subcontractors to submit payment reports by the 10th of each month through an online MWBE Compliance Portal (PRISM). The Portal can be found under Compliance Reporting for Primes and Subcontractors at www.baltimorecountymd.gov/go/mwbe. In the event you are not able to enter your payments in PRISM, a spreadsheet is attached for your use. Please be sure to list the PO for each invoice/ payment reported and include in your submission any corresponding documentation (e.g. copies of invoices or canceled checks).

The County has found that a number of companies are failing to file reports in a timely manner, which makes it difficult for the County to verify compliance. As a result, the County has determined to assess penalties for non-compliance, effective September 1, 2018, as follows:

- (a) For failure to file timely monthly reports:
 - a. Assessment of a late fee of \$10 per day per task, up to a maximum of \$1,500 per task; and/or
 - b. For multiple violations, termination of the contract for convenience or for default, with the contractor suspended from participating in County contracts for five (5) years.
- (b) For failure to meet MWBE requirements:
 - a. Assessment of a penalty of up to 10% of the contract value; and/or
 - b. Termination of the contract for convenience, with the contractor suspended from participating in County contracts for five (5) years together with assessment of a penalty of up to 10% of the contract value; and/or
 - c. Termination of the contract for default together with assessment of a penalty of 10% of the contract value.

Each action and/or remedy described above is at the sole discretion of the County, and is in addition to any damages which the County may be entitled to under the contract. This short video can be used as guidance on submitting the Prime to Subcontractor Payment Reporting:

http://stage.prismcompliance.com/etc/movies/vendor_contractpayment_tutorial.htm

If after contract expiration, it has been determined the MWBE firms named were not used or were under used, by the contractor and supporting documentation was not provided and approved by the County the contractor may be assessed a penalty of up to 10% of the contract value and/or suspended from participating in County contracts for 5 years.

Questions regarding this correspondence and/or the use of this system can be directed to the MWBE Office at mwbe@baltimorecountymd.gov or call (410) 887-3407.

Attachment: MWBE Payment Report Form
 MWBE Payment Acknowledgement Form

Cc: File

S E C T I O N V

POST AWARD DOCUMENTS

**This Section to be Completed
by Successful Bidder after Award**

CONTRACT AGREEMENT

THIS CONTRACT AGREEMENT (“Contract”), IS MADE THIS _____ day of _____ 20____, by and between Baltimore County, Maryland, a body corporate and politic (“County”), and _____, (“Contractor”).

WITNESSETH, that the Contractor, for and in consideration of the payment or payments herein specified and agreed to by the County, hereby covenants and agrees to furnish and deliver all the materials and to do and perform all the work, services, and labor in fulfillment of the requirements of Contract Number **25122 PO0** “Project”) in strict conformity with the solicitation, plans, specifications, special provisions, any and all addenda, and the proposal, at the prices named therein, and all of which are collectively the Proposal, and said Proposal is attached hereto and made a part thereof.

The Project shall be done in strict compliance with (i) the Proposal, (ii) the Baltimore County Department of Public Works and Transportation September 2023 “Standard Specifications for Construction and Materials” and “Standard Details for Construction” (iii) and any and all revisions thereto as of the date of advertisement, including but not limited to the General Conditions Building Projects, as applicable, and all of which (i-iii) are made a part hereof and incorporated herein (collectively, the “Specifications”). Contractor understands and agrees it is Contractor’s responsibility and obligation to obtain a copy of the “Specifications” and agrees the Specifications are incorporated herein. Copies are available on the County’s website at www.baltimorecountymd.gov/departments/public-works/standards.

The Project shall be subject to the inspection and approval of the Office of Budget and Finance – Property Management for Baltimore County, or his authorized representative, and in the event any portion thereof shall be rejected by said Director or his representative as defective or unsuitable, then the said portion shall be removed and replaced and be performed anew to the satisfaction and approval of the said Director or his representative at the cost and expense of the Contractor.

THE CONTRACTOR AFFIRMS that it is aware of, and will comply with, the provisions of Sections 14-101 through 14-108 of the Election Law Article of the Annotated Code of Maryland, as the same may be amended from time to time, which require that every person who makes, during any 12-month period, one or more contracts, with one or more Maryland governmental entities involving cumulative consideration, of at least \$200,000.00, to file with the State Board of Elections certain specified information to include disclosure of attributable political contributions in excess of \$500 during defined reporting periods.

THE CONTRACTOR FURTHER COVENANTS AND AGREES that all the Project shall be furnished, performed and delivered, in every respect, to the satisfaction and approval of the Office of Budget and Finance – Property Management, aforesaid, on or before the expiration of **Two Hundred Thirt-Five (235) CALENDAR DAYS** (the “Contract Period”) after written notice has been given by the Director or their authorized representative to begin the work.

IT IS AGREED THAT TIME IS OF THE ESSENCE. In the event the Contractor fails to achieve Final Completion and Final Acceptance of the Contract work within the Contract Period specified herein, plus any extensions thereto agreed to in writing by a legally authorized representative of the County pursuant to the terms of this Contract, then Contractor shall pay the County the sum of **FIFTEEN HUNDRED DOLLARS (\$1500.00)** as Liquidated Damages for each **CALENDAR DAY** after the expiration of the Contract Period, as may be extended by the County, until the Contractor achieves Final Completion and Final Acceptance of the Project.

Contractor’s Initials

Date

Rev. 09/2024

IT IS FURTHER AGREED that:

- (a) These Liquidated Damages are a reasonable estimate of the County's damages solely due to the public's loss of use of the Project during the delay period and is not a penalty.
- (b) It is very difficult, if not impossible, to accurately measure the damages to the County due to the public's loss of use of the Project during the delay period.
- (c) Notwithstanding GP 8.09 of the Baltimore County Standard Specification for Construction, in addition to the damages due to the public's loss of use of the Project during the delay period, the County is likely to incur additional direct costs during the delay period, including but not limited to, costs for construction management, consultants, architectural services, office trailer and supplies, utilities, County employees' time, County vehicles, and such other costs that the County will incur to continue administration of the construction and the Contract during the delay period, all of which will be monitored by the County, and if so required by the County, the Contractor shall pay such actual damages incurred during the delay period. THE PARTIES HERETO UNDERSTAND AND AGREE THAT CONTRACTOR'S OBLIGATION TO PAY THE COUNTY FOR ACTUAL DAMAGES DURING THE DELAY PERIOD SHALL BE IN ADDITION TO THE CONTRACTOR'S OBLIGATION TO PAY THE LIQUIDATED DAMAGES DUE TO THE PUBLIC'S LOSS OF USE OF THE PROJECT.
- (d) The County shall have the right, but not the obligation, to deduct the Liquidated Damages due to the public's loss of use of the Project, and the County's actual costs and costs to continue administration of the construction and the Contract, from any monies due or any monies that may become due to the Contractor.

IT IS DISTINCTLY UNDERSTOOD AND AGREED that no claim for extra work, material or overhead not specifically provided for in the Contract will be allowed by the County, nor shall the Contractor do any work or furnish any materials not covered by this Contract and the Specifications, unless the same is ordered in writing by a legally authorized representative of the Office of Budget and Finance – Property Management in accordance with the terms of the Contract. Any such work or materials which may be done or furnished by the Contractor without any such written order first being given shall be at said Contractor's sole risk, cost and expense and Contractor hereby covenants and agrees that without such written order, Contractor shall make no claim for compensation for work, materials, or overhead so done or furnished.

NOTWITHSTANDING GP 4.06 OF THE BALTIMORE COUNTY STANDARD SPECIFICATIONS FOR CONSTRUCTION, IT IS SPECIFICALLY AGREED that the Contractor shall have no entitlement to damages arising out of delay, disruption, interference or hindrance from any cause whatsoever. However, this provision shall not preclude recovery or damages by the Contractor for hindrances or delays due solely to fraud or gross negligence on the part of the County or its agents.

IT IS FURTHER DISTINCTLY AGREED that the said Contractor shall not assign this Contract, nor any part thereof, nor any right to any of the monies to be paid hereunder, nor shall any part of the work to be done or material furnished under said Contract be sublet without the prior written consent of a legally authorized representative of the Office of Budget and Finance – Property Management in accordance with the terms of this Contract. Further, the acceptance of the final payment by the Contractor shall effectuate a release in full of all claims against County and its officials, employees, representatives, and agents arising out of, or by reason of the Project and this Contract.

The Contractor shall review government issued identification and badge all employees of the Contractor and its subcontractors. The Contractor shall also review all federal forms, including but not limited to I-9's, for compliance as well as copies of all employment eligibility and identity documentation maintained to the extent required by law.

The Bonds, given by the Contractor in a sum equal to the total contract price of the Project in compliance with the terms and provisions of this Contract, are hereby attached and incorporated herein.

IT IS AGREED that in the event that the County is delayed or prevented from timely execution of this Contract, the Contractor releases County and agrees Contractor shall have no action, claim or demand against County therefore.

Contractor's Initials

Date

Rev. 09/2024

THE CONTRACTOR HEREBY FURTHER AGREES to receive the prices set forth in the Proposal incorporated herein as full compensation for the completion of the Project and, in all respects, to complete said Contract to the satisfaction of the County.

THE CONTRACTOR REPRESENTS AND WARRANTS:

- (i) it is duly formed and validly existing under the laws of the State of _____;
- (ii) it is in good standing in the State of Maryland;
- (iii) it has the power and authority to consummate the obligations and responsibilities contemplated hereby, and has taken all necessary action to authorize the execution, delivery and performance required under this Contract;
- (iv) the Contractor and the person executing this Contract for the Contractor each warrant that he/she is duly authorized by the Contractor to execute and seal this Contract on the Contractor's behalf;
- (v) the warranties of merchantability and fitness for a particular purpose and use and warranties of title and against infringement, and all express warranties contained in this Contract, including but not limited to the Proposal (and any sample or model presented by Contractor and expressly accepted by the County) shall apply to the portion of this Contract pertaining to or for goods;
- (vi) all representations and warranties made in the Proposal and herein remain true and correct in all respects when made, as of the date of this Contract, and throughout the term of this Contract; and
- (vii) there exists no actual or potential conflict of interest between its performance under this Contract and its engagement or involvement in any other personal or professional activities and in the event such conflict or potential conflict arises during the term of this Contract, the Contractor shall immediately advise the County in writing thereof.

THE CONTRACTOR shall not disclose any documentation and information of any kind or nature disclosed to the Contractor in the course of its performance of duties hereunder without the express prior written consent of the County.

Those sections in this Contract which by their nature are intended to survive, including but not limited to, Contractor's representations and warranties, confidential information, and indemnification shall survive the termination of this Contract.

IN WITNESS WHEREOF, the Contractor has hereunto set its hand and seal the day and year first above written.

CONTRACTOR NAME: _____

WITNESS FEDERAL TAX ID or SS #: _____

By: _____ (Seal)

Name: _____

Type (Print) Name

Title: _____ Date: _____

WITNESS: **BALTIMORE COUNTY, MARYLAND**

Executive Secretary By: _____ Date: _____
D'Andrea L. Walker, County Administrative Officer

Type (Print) Name

APPROVED FOR FORM AND LEGAL
AND SUFFICIENCY* (Subject to
execution by the duly authorized
Administrative official and Chairperson
of the County Council, as indicated).

APPROVED:

Kevin D. Reed, Director
Office of Budget and Finance Date: _____

Office of the County Attorney

*Approval of Form and Legal Sufficiency does not convey approval or disapproval of the substantive nature of this transaction. Approval is based upon typeset documents. All modifications require re-approval.

Rev. 09/2024

PERFORMANCE BOND

Bond No. _____

Principal _____

Business Address of Principal _____

Surety _____

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

Penal Sum of Bond (express in words and figures)

Baltimore County Detention Center Lobby Renovations

Contract Name

25122 PO0

Contract Number

DOLLARS

\$

Date of Contract

20

Date Bond Executed

20

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County law and the contract.

NOW, THEREFORE, if the aforesaid PRINCIPAL shall well and truly perform and fulfill all the undertakings, covenants, terms, conditions, and agreements of said contract during the original term of said contract and any extensions thereof that may be granted by the OBLIGEE with or without notice to the SURETY, and during the life of any guaranty required under the contract, and shall also well and truly perform and fulfill all the undertakings covenants, terms, conditions and agreements of any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, then, this obligation to be void; otherwise to remain in full force and effect.

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Performance Bond is required for each and every Contract in excess of twenty-five thousand (\$25,000). A Performance Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Performance Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and seal of each party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In Presence of:**Individual Principal**

Witness: _____

as to: _____ (SEAL)

Print Name: _____

Print Name: _____

Attest:**Corporate Principal**

(Name of Corporation)

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Attest:**Surety**

(Name of Surety)

Business Address: _____

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

Office of the County Attorney

PAYMENT BOND

Bond Number _____

Principal _____

Business Address of Principal _____

Surety _____

Obligee: **BALTIMORE COUNTY, MARYLAND**
A body corporate and politic

A Corporation of the State of _____ and authorized to do business in Maryland

DOLLARS \$ _____

Penal Sum of Bond (express in words and figures) _____

Baltimore County Detention Center Lobby Renovations
Contract Name_____ 20 _____
Date of Contract**25122 PO0**
Contract Number_____ 20 _____
Date Bond Executed

KNOW ALL MEN BY THESE PRESENTS, that we, the PRINCIPAL, above-named, and SURETY, above-named, and authorized to do business in the State of Maryland, are held and firmly bound unto the OBLIGEE, above-named, in the penal sum of the amount stated above, for the payment of which sum well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS, THE PRINCIPAL entered into a certain contract with the OBLIGEE described and dated as shown above and is required to provide this bond pursuant to Maryland State law and/or County Law and the contract.

NOW, THEREFORE, the condition of this obligation is such that if the aforesaid PRINCIPAL shall promptly make payments to all persons supplying labor and/or material to the PRINCIPAL and to any subcontractor of the PRINCIPAL in the prosecution of the work provided for in said contract and any and all duly authorized modifications of said contract that may hereafter be made, notice of which modifications to the SURETY being hereby waived, then, this obligation to be void; otherwise to remain in full force and effect.

THE SURETY FURTHER GUARANTEES That it is (a) licensed in the State of Maryland, (b) rated "B" or better by the A.M. Best Company, (c) on federal funded projects, authorized by the underwriting limitation contained in the U.S. Department of the Treasury Circular 570, as amended, to guaranty the amount of the Bid, and (d) in good standing as determined by the County's Engineer. A Payment Bond is required for each and every Contract in excess of twenty-five thousand (\$25,000). A Payment Bond shall be in the amount equal to at least one hundred (100%) percent of the Contract price. The fully executed Payment Bond shall be delivered by the Bidder to the Department's Division of Construction Contracts Administration no later than the time the Contract is to be executed by the Contractor.

IN WITNESS WHEREOF, the above-bounded parties have executed this instrument under their several seals on the date indicated above, the name and seal of each party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

In Presence of:

Individual Principal

Witness: _____

as to: _____ (SEAL)

Print Name: _____

Print Name: _____

Attest:

Corporate Principal

(Name of Corporation)

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Attest:

Surety

(Name of Surety)

Business Address: _____

Witness: _____

By: _____ Affix

Print Name: _____

Print Name: _____ Corporate

Title: _____ Seal

Reviewed for Baltimore County Requirements

Office of the County Attorney



BALTIMORE COUNTY, MARYLAND

INSURANCE PROVISIONS

1. GENERAL REQUIREMENTS

- 1.1 Coverages Required:
Unless otherwise required by the specifications or the contract, the Contractor/Vendor shall purchase and maintain the insurance coverage's listed herein.
- 1.2 Certificate of Insurance:
Before starting work on the contract, or prior to the execution of the Contract on those bid, the Contractor/Vendor shall provide Baltimore County, Maryland with verification of insurance coverage evidencing the required coverages.
- 1.3 Baltimore County as Insured:
The coverage required, excluding Workers' Compensation and Employers' Liability and Medical Malpractice Liability/Professional Liability/Errors and Omissions Liability, must include Baltimore County, Maryland and its agents, employees, officers, directors, and appointed and elected officials as an additional insured.
- 1.4 Contractor's/Vendor's Responsibility:
The providing of any insurance herein does not relieve the Contractor/Vendor of any of the responsibilities or obligations the Contractor/Vendor has assumed in the contract or for which the Contractor/Vendor may be liable by law or otherwise.
- 1.5 Failure to Provide Insurance:
Failure to provide and continue in force the required insurance shall be deemed a material breach of the contract. The Contractor/Vendor must maintain the insurance coverages required under the terms and conditions on this Contract while this Contract is in effect including renewal and extension terms.

2. INSURANCE COVERAGES

- 2.1 General Liability Insurance
- 2.1.1 Minimum Limits of Coverage:
Personal Injury Liability and Property Damage Liability
Combined Single Limit - \$500,000 each occurrence.
- 2.1.2 Such insurance shall protect the Contractor/Vendor from claims which may arise out of, or result from, the Contractor's/Vendor's operations under the contract, whether such operations be by the Contractor/Vendor, any subcontractor, anyone directly or indirectly employed by the Contractor/Vendor or Subcontractor, or anyone for whose acts any of the above may be liable.
- 2.1.3 Minimum Coverages to be Included:
(a) Independent Contractor's coverage;
(b) Completed Operations and Products Liability coverage;
(c) Contractual Liability coverage.

- 2.1.4 Damages not to be Excluded:
Such insurance shall contain no exclusions applying to operations by the Contractor/Vendor or any Subcontractor in the performance of the Contract including but not limited to:
(a) Collapse of, or structural injury to, any building or structure;
(b) Damage to underground property; or
(c) Damage arising out of blasting or explosion.

2.2 Automobile Liability Insurance

- 2.2.1 Minimum Limits of Coverage:
Bodily Injury Liability and Property Damage Liability
Combined Single Limit - \$500,000 any one accident.
- 2.2.2 Minimum Coverages to be Included:
Such insurance shall provide coverage for all owned, non-owned and hired automobiles.

2.3 Workers' Compensation and Employers' Liability Insurance

Such insurance must contain statutory coverage, including
Employers' Liability insurance with limits of at least:
Bodily Injury by Accident - \$250,000 each accident
Bodily Injury by Disease - \$500,000 policy limit
Bodily Injury by Disease - \$250,000 each employee

2.4 Valuable Papers and Records Coverage and Electronic Data Processing (Data and Media) Coverage

Minimum Limits of Coverage:
\$100,000 Per Claim and Each Occurrence
\$100,000 in the Aggregate

2.5 Other

Such other insurance in form and amount as may be customary for the type of business being under taken by the Contractor/Vendor.

2.6 Builder's Risk

See Special Provisions page 454 and General Conditions page 34,35, Article 33.