Purchasing Office
191 South East St
Frederick, Maryland 21701
301-644-5208 phone
301-644-5213 fax
kim.miskell@fcps.org

Frederick County Public Schools
Reach. Challenge. Prepare.

Stephen P. Starmer C.P.M., CSBA,
Purchasing Manager
Kim Miskell, CSBO, Assistant Purchasing Manager
Bill Meekins CPPB, CSBO, CPCP,
Purchasing Agent
Billie Laughland, Purchasing Agent
Shane Ryberg, Purchasing Agent

RFQ NUMBER/NAME:	19C5, Security Vestibules for Monocacy Middle, Ballenger Creek Middle and Catoctin High Schools
ISSUE DATE:	October 9, 2018
CONTRACT MANAGER:	Kim Miskell, CSBO, Assistant Purchasing Manager, kim.miskell@fcps.org
CONTRACT ADMINISTRATOR:	Bradley Ahalt, Senior Project Manager, Construction Management, bradley.ahalt@fcps.org
PRE-QUOTE DATE:	9:00 A.M., local time, on October 19, 2018 (Attendance is encouraged, but not mandatory.)
PRE-QUOTE LOCATION:	Begins at 9:00 A.M., local time at to Catoctin High School, 14745 Sabillasville Road, Thurmont, MD 21788; proceed to Monocacy Middle School, 8009 Opossumtown Pike, Frederick, MD 21702; and ending at Ballenger Creek Middle School, 5525 Ballenger Creek Pike, Frederick, MD 21703.
BONDS REQUIRED:	YES {If Total Base Bid is Greater than $100,000}
MBE REQUIREMENTS:	YES
RFQ DUE:	4:00 P.M., local time, on November 8, 2018 Faxed or emailed bids are not acceptable.
SEALED RFQ DELIVERED TO:	Frederick County Public Schools Attn: Purchasing Department 191 South East Street Frederick, MD 21701 (Parking is available at Deck #5 on All Saints Street) Bid proposal must be properly marked with vendor's business name, address, bid name and number on the envelope or package. Do not return the following pages: cover page, table of contents, map, calendar, directory or terms and conditions.
TENTATIVE AWARD DATE:	TBD

FACILITIES SERVICES DIVISION
CONSTRUCTION MANAGEMENT DEPARTMENT
191 South East Street
Frederick, Maryland 21701
301-644-5176 Phone
301-644-5027 Fax
www.fcps.org

Roger Fritz, Director
Roger.fritz@fcps.org
Brad Ahalt, Senior Project Manager
Brian Staiger, Senior Project Manager
Tony Ray, Project Manager III
Vernon Beals, Project Manager III
Thomas Mulligan, Project Manager III

Request for Proposal

Date: October 9, 2018

To: Callas Contractors, Inc. – Attn. Tina Rhodes – trhodes@callascontractors.com
Keller Brothers, Inc. – Attn. Tom Hamilton – tom@kellerbrothers.com
Waynesboro Construction Co, Inc. - Attn. Danny VanGosen – danny@waynesboroconstruction.com

Project: Monocacy Middle School – Security Vestibule
Ballenger Creek Middle School – Security Vestibule
Catoctin High School – Security Vestibule

Proposal Due Date: November 8, 2018 by 4:00 pm

Project Summary / Description

FCPS Construction Management is requesting individual Lump Sum Proposals for each of the three (3) Security Vestibule Projects from the awarded RFP Bid #17MISC1 General Contractors listed above to provide all labor, materials, equipment, services and incidentals as necessary to provide the new Security Vestibule at Monocacy Middle School (MoMS), Ballenger Creek Middle School (BCMS) and Catoctin High School (CHS) in strict accordance with the drawings and specifications as prepared by Profitt and Associates Architects and dated May 15, 2018 and as per the direction contained in the RFP dated October 1, 2018 and in accordance with FCPS RFP 17MISC1, Qualifications of General Construction Contractors for Minor Construction Projects..

Project Scope of Work

1. Provide all labor, materials, equipment, services and incidentals as necessary to provide the new Security Vestibule at MoMS, BCMS and CHS to include the following activities as they pertain to the Base Bid and Alternate #1A and #1B:
    a. General Conditions
    b. Site Work
    c. Thermal and Moisture Protection
    d. Doors and Windows including the FCPS specified Hardware and Aluminum Storefront Manufacturer
    e. Finishes
    f. Specialties
    g. Mechanical
    h. Electric
2. Drawings and Specifications - FCPS MoMS, BCMS and CHS Security Vestibule dated May 15, 2018.
3. **Pre-Bid Site Visit – Friday October 19, 2018 at 9:00 am starting at CHS then MoMS and BCMS.**
4. The Building Permits have been obtained from the City of Frederick and Frederick County.
5. These Security Vestibule Projects will be locally and state funded via the FY 2019 School Safety Grant Program and there will be a **5% MBE requirement for each individual Project.** The anticipated value of each individual Project is not expected to require the Prevailing Wage requirements and the Bid Bond requirement is being waived.

Project Construction Schedule

- Summer 2019 – June 10 – August 23 2019

Please address all questions to Bradley Ahalt at 301-644-5164 or Bradley.Ahalt@fcps.org

Please complete the Form of Proposal for each Project and deliver to the Purchasing Department by 4:00 pm November 8, 2018.
FCPS Purchasing Department - Attn. Kim Miskell, CSBO, Assistant Purchasing Manager
Re: RFQ 19C5, MOMS, BCMS & CHS – Security Vestibule
191 South East Street
Frederick, MD 21701

Thanks for your interest, cooperation and assistance.

Bradley W. Ahalt
Senior Project Manager
FCPS Construction Management

FREDERICK COUNTY PUBLIC SCHOOLS
PURCHASING DEPT.
191 SOUTH EAST STREET
FREDERICK, MD 21701
PHONE: 301-644-5208
FAX: 301-644-5213

RFQ 19C5, SECURITY VESTIBULE FOR MONOCACY MIDDLE SCHOOL
FORM OF PROPOSAL

We offer to perform the following Security Vestibule Project in strict accordance with the drawings and specifications as prepared by Proffitt and Associates Architects and dated May 15, 2018 and as per the direction contained in the RFQ dated October 10, 2018 and in accordance with FCPS RFP 17MISC1, Qualifications of General Construction Contractors for Minor Construction Projects.

Total Base Bid:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1A:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1B:

$_____ _____
Total Lump Sum Amount in Words

Subcontractor Selection:
Aluminum Storefront Contractor: _____

Material Selection: _____

Aluminum Storefront Manufacturer: _____

Qualifications: Please complete the Form of Proposal and provide the cost information and the MBE information as requested in its entirety.

I/We certify that this bid/proposal is made without previous understanding, agreement, or connection with any person, firm, or corporation submitting a bid/proposal for the same goods/services and is, in all respects fair and without collusion or fraud; that none of this company's officers, directors, partners or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or federal government; and that no member of the Board of Education of Frederick County, Administrative or Supervisory Personnel or other employees of the Frederick County Public Schools, has any interest in the bidding company except as follows:

COMPANY: _____

dba: _____

REGISTERED MARYLAND CONTRACTOR NUMBER: _____

FEDERAL IDENTIFICATION: _____ DATE: _____

The undersigned has familiarized themselves with the conditions affecting the work, the specifications, and is legally authorized to make this proposal on behalf of the Contractor listed above.

NAME (please print): _____

SIGNATURE OF ABOVE: _____

TITLE: _____

ADDRESS: _____

_____

TELEPHONE # _____ FAX # _____

E-MAIL ADDRESS (for correspondence): _____

E-MAIL ADDRESS (for receiving Purchase Orders): _____

(DO NOT COMPLETE THIS AREA IF YOUR COMPANY IS UNABLE TO RECEIVE PURCHASE ORDERS ELECTRONICALLY)

……

ACKNOWLEDGMENT OF ADDENDA (if applicable)

The above-signed company/firm acknowledges the receipt of the following addenda for the above-referenced solicitation.

Date Received by Proposer/Bidder:

Addendum #1	_____	Addendum #2	_____
Addendum #3	_____	Addendum #4	_____
Addendum #5	_____	Addendum #6	_____
Addendum #7	_____	Addendum #8	_____

FREDERICK COUNTY PUBLIC SCHOOLS
PURCHASING DEPT.
191 SOUTH EAST STREET
FREDERICK, MD 21701
PHONE: 301-644-5208
FAX: 301-644-5213

RFQ 19C5, SECURITY VESTIBULE FOR BALLENGER CREEK MIDDLE SCHOOL
FORM OF PROPOSAL

We offer to perform the following Security Vestibule Project in strict accordance with the drawings and specifications as prepared by Proffitt and Associates Architects and dated May 15, 2018 and as per the direction contained in the RFQ dated October 10, 2018 and in accordance with FCPS RFP 17MISC1, Qualifications of General Construction Contractors for Minor Construction Projects.

Total Base Bid:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1A:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1B:

$_____ _____
Total Lump Sum Amount in Words

Subcontractor Selection:
Aluminum Storefront Contractor: _____

Material Selection: _____

Aluminum Storefront Manufacturer: _____

Qualifications: Please complete the Form of Proposal and provide the cost information and the MBE information as requested in its entirety.

I/We certify that this bid/proposal is made without previous understanding, agreement, or connection with any person, firm, or corporation submitting a bid/proposal for the same goods/services and is, in all respects fair and without collusion or fraud; that none of this company's officers, directors, partners or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or federal government; and that no member of the Board of Education of Frederick County, Administrative or Supervisory Personnel or other employees of the Frederick County Public Schools, has any interest in the bidding company except as follows:

COMPANY: _____

dba: _____

REGISTERED MARYLAND CONTRACTOR NUMBER: _____

FEDERAL IDENTIFICATION: _____ DATE: _____

The undersigned has familiarized themselves with the conditions affecting the work, the specifications, and is legally authorized to make this proposal on behalf of the Contractor listed above.

NAME (please print): _____

SIGNATURE OF ABOVE: _____

TITLE: _____

ADDRESS: _____

_____

TELEPHONE # _____ FAX # _____

E-MAIL ADDRESS (for correspondence): _____

E-MAIL ADDRESS (for receiving Purchase Orders): _____

(DO NOT COMPLETE THIS AREA IF YOUR COMPANY IS UNABLE TO RECEIVE PURCHASE ORDERS ELECTRONICALLY)

……

ACKNOWLEDGMENT OF ADDENDA (if applicable)

The above-signed company/firm acknowledges the receipt of the following addenda for the above-referenced solicitation.

Date Received by Proposer/Bidder:

Addendum #1	_____	Addendum #2	_____
Addendum #3	_____	Addendum #4	_____
Addendum #5	_____	Addendum #6	_____
Addendum #7	_____	Addendum #8	_____

FREDERICK COUNTY PUBLIC SCHOOLS
PURCHASING DEPT.
191 SOUTH EAST STREET
FREDERICK, MD 21701
PHONE: 301-644-5208
FAX: 301-644-5213

RFQ 19C5, SECURITY VESTIBULE FOR CATOCTIN HIGH SCHOOL
FORM OF PROPOSAL

We offer to perform the following Security Vestibule Project in strict accordance with the drawings and specifications as prepared by Proffitt and Associates Architects and dated May 15, 2018 and as per the direction contained in the RFQ dated October 10, 2018 and in accordance with FCPS RFP 17MISC1, Qualifications of General Construction Contractors for Minor Construction Projects.

Total Base Bid:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1A:

$_____ _____
Total Lump Sum Amount in Words

Alternate #1B:

$_____ _____
Total Lump Sum Amount in Words

Subcontractor Selection:
Aluminum Storefront Contractor: _____

Material Selection: _____

Aluminum Storefront Manufacturer: _____

Qualifications: Please complete the Form of Proposal and provide the cost information and the MBE information as requested in its entirety.

I/We certify that this bid/proposal is made without previous understanding, agreement, or connection with any person, firm, or corporation submitting a bid/proposal for the same goods/services and is, in all respects fair and without collusion or fraud; that none of this company's officers, directors, partners or its employees have been convicted of bribery, attempted bribery, or conspiracy to bribe under the laws of any state or federal government; and that no member of the Board of Education of Frederick County, Administrative or Supervisory Personnel or other employees of the Frederick County Public Schools, has any interest in the bidding company except as follows:

COMPANY: _____

dba: _____

REGISTERED MARYLAND CONTRACTOR NUMBER: _____

FEDERAL IDENTIFICATION: _____ DATE: _____

The undersigned has familiarized themselves with the conditions affecting the work, the specifications, and is legally authorized to make this proposal on behalf of the Contractor listed above.

NAME (please print): _____

SIGNATURE OF ABOVE: _____

TITLE: _____

ADDRESS: _____

_____

TELEPHONE # _____ FAX # _____

E-MAIL ADDRESS (for correspondence): _____

E-MAIL ADDRESS (for receiving Purchase Orders): _____

(DO NOT COMPLETE THIS AREA IF YOUR COMPANY IS UNABLE TO RECEIVE PURCHASE ORDERS ELECTRONICALLY)

……

ACKNOWLEDGMENT OF ADDENDA (if applicable)

The above-signed company/firm acknowledges the receipt of the following addenda for the above-referenced solicitation.

Date Received by Proposer/Bidder:

Addendum #1	_____	Addendum #2	_____
Addendum #3	_____	Addendum #4	_____
Addendum #5	_____	Addendum #6	_____
Addendum #7	_____	Addendum #8	_____

RFQ 19C5, SECURITY VESTIBULES FOR MONOCACY MIDDLE, BALLENGER CREEK MIDDLE, AND CATOCTIN HIGH SCHOOLS
FREDERICK COUNTY PUBLIC SCHOOLS
STATUTORY AFFIDAVIT AND NON-COLLUSION CERTIFICATION

Special Instructions: An authorized representative of the bidder needs to complete the following affidavit and insert an answer to paragraphs 1 and 3.

BIDDERS: The submission of the following Affidavit at the time of the bid opening is:

[X] requested to be completed but not required to be notarized.

[ ] required to be completed and notarized.

I, _____, being duly sworn, depose and state:

1. I am the _____ (officer) and duly authorized representative of the firm of

the organization named _____ whose address is
(Name of Corporation)
_____ and that I

possess the authority to make this affidavit and certification on behalf of myself and the firm for which I am acting.

2. Except as described in paragraph 3 below, neither I, nor to the best of my knowledge, the above firm, nor any of its officers, directors, or partners, or any of its employees who are directly involved in obtaining or performing contracts with any public bodies has:

   a. been convicted of bribery, attempted bribery, or conspiracy to bribe, under the laws of any state or of the federal government;

   b. been convicted under the laws of the state, another state, or the United States of: a criminal offense incident to obtaining, attempting to obtain, or performing a public or private contract; or fraud, embezzlement, theft, forgery, falsification or destruction of records, or receiving stolen property;

   c. been convicted of criminal violation of an antitrust statute of the State of Maryland, another state, or the United States;

   d. been convicted of a violation of the Racketeer influenced and Corrupt Organization Act, or the Mail Fraud Act, for acts in connection with the submission of bids or proposals for a public or private contract;

   e. been convicted of any felony offenses connected with obtaining, holding, or maintaining a minority business enterprise certification, as prohibited by Section 14-308 of the State Finance & Procurement Article;

   f. been convicted of conspiracy to commit any act or omission that would constitute grounds for conviction under any of the laws or statutes described in Paragraph (a) through (e) above; or

   g. been found civilly liable under an antitrust statute of this State, another state, or the United States for acts or omissions in connection with the submission of bids or proposals for a public or private contract.

3. The only conviction, plea, or admission by any officer, director, partner, or employee of this firm to involvement in any of the conduct described in Paragraph 2 above is as follows:

If none, write "None" below. If involvement, list the date, count, or charge, official or administrative body, the individuals involved, their position with the firm, and the sentence or disposition of the charge.

_____

_____

(you may attach an explanation if necessary)

4. I affirm that this firm will not knowingly enter into a contract with a public body under which a person or business debarred or suspended under Maryland State Finance and Procurement Title 16, subtitle 3, Annotated Code of Maryland, as amended, will provide, directly or indirectly, supplies, services, architectural services, construction-related services, leases of real property, or construction.

5. I affirm that this proposal or bid to the Board of Education of Frederick County is genuine and not collusive or a sham; that said bidder has not colluded, conspired, connived and agreed, directly or indirectly, with any bidder or person to put in a sham bid or to refrain from bidding and is not in any manner, directly or indirectly, sought by agreement of collusion or communication or conference, with any person to fix the bid prices of the affidavit or any other bidder, or to fix any overhead, profit or cost element of said bid price, or that if any bidder, or to secure an advantage against the Board of Education of Frederick County or any other person interested in the proposed contract; and that all statements in the proposal or bid are true. I acknowledge that, if the representations set forth in this affidavit are not true and correct, the Board of Education of Frederick County may terminate any contract awarded and take any other appropriate action.

I DO SOLEMNLY DECLARE AND AFFIRM under the penalties of perjury that the contents of this affidavit are true and correct, that I am executing this Affidavit in compliance with Section 16-311 of the State Finance and Procurement Article, Annotated Code of Maryland, and in compliance with requirements of the Board of Education of Frederick County, and that I am executing and submitting this Proposal on behalf of and as authorized by the bidder named below.

_____

(Legal Name of Company)

_____

(dba)

_____

(Address)

_____

(City) (State) (Zip)

_____

(Telephone) (Fax)

_____

(Print Name) (Title) (Date)

_____

(Signature) (Title) (Date)

We are/I am licensed to do business in the State of Maryland as a:
( ) Corporation ( ) Partnership ( ) Individual ( ) Other

If required to be notarized:

_____ _____

(Witness) (Title)

SUBSCRIBED AND SWORN to before me on this _____day of _____, 20___.

_____

NOTARY PUBLIC

My Commission Expires: _____

RFQ 19C5, SECURITY VESTIBULES FOR MONOCACY MIDDLE, BALLENGER CREEK MIDDLE, AND CATOCTIN HIGH SCHOOLS
FREDERICK COUNTY PUBLIC SCHOOLS
CERTIFICATION OF COMPLIANCE

1. All Contractors, subcontractors or vendors must abide by FCPS Board policies and regulations while working on FCPS property.

2. Maryland Law requires that any person who enters into a contract with a county board of education may not knowingly employ an individual to work at a schools (or FCPS facility) if the individual is a registered sex offender. Please reference §11-113 of the Criminal Procedure Article of Maryland Code for penalty.

3. Be advised that individuals who are registered sex offenders are not eligible to work on any FCPS project. The Contractor must initially check the Maryland Department of Public Safety & Correctional Services' MARYLAND SEX OFFENDER REGISTRY and search for the name of any employee to be assigned to work on this project. This applies to subcontractors and material/equipment suppliers as well.

4. In the event that a registered sex offender is discovered to be working on a FCPS project, whether through employment by the prime Contractor, subcontractor or vendor, the site superintendent will immediately remove the individual from the premises and permanently terminate his work assignment. FCPS may terminate this contract as a result if the Contractor is unable to demonstrate he has exercised care and diligence in the past in checking the Maryland registry.

5. Effective July 1, 2015, amendments to §6-113 of the Education Article of the Maryland Code further require that a contractor or subcontractor or vendor for a local school system may not knowingly assign an employee to work on school premises with direct, unsupervised, and uncontrolled access to children, if the employee has been convicted of, or pled guilty or nolo contendere to, a crime involving:

    a. A sexual offense in the third or fourth degree under §3-307 or §3-308 of the Criminal Law Article of the Maryland Code.

    b. Child sexual abuse under §3-602 of the Criminal Law Article of the Maryland Code or any other State; or

    c. A crime of violence as defined in §14-101 of the Criminal Law Article of the Maryland Code or any other State

6. Under recent amendments to §5-561 of the Family Law Article of the Maryland Code, each contractor, subcontractor or vendor shall certify by signing this affidavit that any individuals in its work-force including sub-contractors, have undergone a criminal background check, including fingerprinting, if the individuals will work in a FCPS school facility in circumstances where they have direct, unsupervised, and uncontrolled access to children.

By my signature below, I affirm under penalties of perjury that the contents of this Certification of Compliance are true to the best of my knowledge, information and belief.

Signature_____Date_____

Print name and title of signatory_____

Print name of company_____

Attachment A

CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT

***NOTE: You must include this document with your bid or offer*. If you do not submit the form with your bid or offer, the procurement officer shall deem your bid non-responsive or your offer not reasonably susceptible of being selected for award.**

* * * * * * * * * * * * * * *

Part I.

I acknowledge the:

- Overall certified MBE subcontract participation goal of 5 %. and
- The subgoals, if applicable, of:
  - 0 % for certified African American-owned businesses and
  - 0 % for certified Asian American-owned businesses.

I have made a good-faith effort to achieve this goal. If awarded the contract, I will continue to attempt to increase MBE participation during the project.

Part II.

Check ONE Box

NOTE: FAILURE TO CHECK ONE OF BOXES 1, 2, or 3 BELOW WILL RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

NOTE: INCONSISTENCY BETWEEN THE ASSERTIONS ON THIS FORM AND THE INFORMATION PROVIDED ON THE *MBE PARTICIPATION SCHEDULE* (ATTACHMENT B) MAY RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

1 ☐ I have met the overall MBE goal and MBE subgoals for this project. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details how I will reach that goal.

or

2 ☐ After having made a good-faith effort to achieve the overall MBE goal and MBE subgoals for this project, I can achieve partial success only. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details the MBE participation I have achieved.

I request a partial waiver as follows:

- Waiver of overall MBE subcontract participation goal: ____ %
- Waiver of MBE subcontract participation subgoals, if applicable:
  - ____ % for certified African American-owned businesses and
  - ____ % for certified Asian American-owned businesses.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

3 ☐ After having made a good faith effort to achieve the overall MBE goal and MBE subgoals for this project, I am unable to achieve any portion of the goal or subgoals. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B].

I request a full waiver.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

Part III.

I understand that if I am the apparent awardee or conditional awardee, I must submit **within 10 working days** after receiving notice of the potential award or within 10 days after the date of conditional award – whichever is earlier – the:

- *Outreach Efforts Compliance Statement* (Attachment C)
- *Subcontractor Project Participation Statement* (Attachment D)
- *Minority Subcontractors Unavailability Certificate* (Attachment E) (if applicable)
- Any other documentation the Procurement Officer requires to ascertain my responsibility in connection with the MBE participation goal and subgoals

I acknowledge that if I fail to timely return complete documents, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has been awarded, the award is voidable.

I acknowledge that the MBE subcontractors/suppliers listed in the *MBE Participation Schedule* and any additional MBE subcontractor/suppliers identified in the *Subcontractor Project Participation Statement* will be used to accomplish the percentage of MBE participation that I intend to achieve.

In the solicitation of subcontract quotations or offers, MBE subcontractors were provided the same information and amount of time to respond as were non-MBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE subcontractors at a competitive disadvantage to non-MBE 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	Affiant Signature
_____	_____
Address	Printed Name & Title
_____	_____
Address (continued)	Date

October 2017

Attachment A

CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT

***NOTE: You must include this document with your bid or offer*. If you do not submit the form with your bid or offer, the procurement officer shall deem your bid non-responsive or your offer not reasonably susceptible of being selected for award.**

* * * * * * * * * * * * * * *

Part I.

I acknowledge the:

- Overall certified MBE subcontract participation goal of __5__ %. and
- The subgoals, if applicable, of:
  - _0_ % for certified African American-owned businesses and
  - __0__ % for certified Asian American-owned businesses.

I have made a good-faith effort to achieve this goal. If awarded the contract, I will continue to attempt to increase MBE participation during the project.

Part II.

Check ONE Box

NOTE: FAILURE TO CHECK ONE OF BOXES 1, 2, or 3 BELOW WILL RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

NOTE: INCONSISTENCY BETWEEN THE ASSERTIONS ON THIS FORM AND THE INFORMATION PROVIDED ON THE *MBE PARTICIPATION SCHEDULE* (ATTACHMENT B) MAY RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

1 ☐ I have met the overall MBE goal and MBE subgoals for this project. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details how I will reach that goal.

or

2 ☐ After having made a good-faith effort to achieve the overall MBE goal and MBE subgoals for this project, I can achieve partial success only. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details the MBE participation I have achieved.

I request a partial waiver as follows:

- Waiver of overall MBE subcontract participation goal: ____ %
- Waiver of MBE subcontract participation subgoals, if applicable:
  - ____ % for certified African American-owned businesses and
  - ____ % for certified Asian American-owned businesses.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

3 ☐ After having made a good faith effort to achieve the overall MBE goal and MBE subgoals for this project, I am unable to achieve any portion of the goal or subgoals. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B].

I request a full waiver.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

Part III.

I understand that if I am the apparent awardee or conditional awardee, I must submit **within 10 working days** after receiving notice of the potential award or within 10 days after the date of conditional award – whichever is earlier – the:

- *Outreach Efforts Compliance Statement* (Attachment C)
- *Subcontractor Project Participation Statement* (Attachment D)
- *Minority Subcontractors Unavailability Certificate* (Attachment E) (if applicable)
- Any other documentation the Procurement Officer requires to ascertain my responsibility in connection with the MBE participation goal and subgoals

I acknowledge that if I fail to timely return complete documents, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has been awarded, the award is voidable.

I acknowledge that the MBE subcontractors/suppliers listed in the *MBE Participation Schedule* and any additional MBE subcontractor/suppliers identified in the *Subcontractor Project Participation Statement* will be used to accomplish the percentage of MBE participation that I intend to achieve.

In the solicitation of subcontract quotations or offers, MBE subcontractors were provided the same information and amount of time to respond as were non-MBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE subcontractors at a competitive disadvantage to non-MBE 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	Affiant Signature
_____	_____
Address	Printed Name & Title
_____	_____
Address (continued)	Date

October 2017

Attachment A

CERTIFIED MINORITY BUSINESS ENTERPRISE UTILIZATION AND FAIR SOLICITATION AFFIDAVIT

***NOTE: You must include this document with your bid or offer*. If you do not submit the form with your bid or offer, the procurement officer shall deem your bid non-responsive or your offer not reasonably susceptible of being selected for award.**

* * * * * * * * * * * * * * *

Part I.

I acknowledge the:

- Overall certified MBE subcontract participation goal of _5__ %. and
- The subgoals, if applicable, of:
  - _0_ % for certified African American-owned businesses and
  - __0_ % for certified Asian American-owned businesses.

I have made a good-faith effort to achieve this goal. If awarded the contract, I will continue to attempt to increase MBE participation during the project.

Part II.

Check ONE Box

NOTE: FAILURE TO CHECK ONE OF BOXES 1, 2, or 3 BELOW WILL RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

NOTE: INCONSISTENCY BETWEEN THE ASSERTIONS ON THIS FORM AND THE INFORMATION PROVIDED ON THE *MBE PARTICIPATION SCHEDULE* (ATTACHMENT B) MAY RENDER A BID NON-RESPONSIVE OR AN OFFER NOT REASONABLY SUSCEPTIBLE OF BEING SELECTED FOR AWARD

1 ☐ I have met the overall MBE goal and MBE subgoals for this project. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details how I will reach that goal.

or

2 ☐ After having made a good-faith effort to achieve the overall MBE goal and MBE subgoals for this project, I can achieve partial success only. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B], which details the MBE participation I have achieved.

I request a partial waiver as follows:

- Waiver of overall MBE subcontract participation goal: ____ %
- Waiver of MBE subcontract participation subgoals, if applicable:
  - ____ % for certified African American-owned businesses and
  - ____ % for certified Asian American-owned businesses.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

3 ☐ After having made a good faith effort to achieve the overall MBE goal and MBE subgoals for this project, I am unable to achieve any portion of the goal or subgoals. I submit with this Affidavit [Attachment A] the *MBE Participation Schedule* [Attachment B].

I request a full waiver.

Within 10 days of being informed that I am the apparent awardee, I will submit *MBE Waiver Documentation* [Attachment F] (with supporting documentation).

Part III.

I understand that if I am the apparent awardee or conditional awardee, I must submit **within 10 working days** after receiving notice of the potential award or within 10 days after the date of conditional award – whichever is earlier – the:

- *Outreach Efforts Compliance Statement* (Attachment C)
- *Subcontractor Project Participation Statement* (Attachment D)
- *Minority Subcontractors Unavailability Certificate* (Attachment E) (if applicable)
- Any other documentation the Procurement Officer requires to ascertain my responsibility in connection with the MBE participation goal and subgoals

I acknowledge that if I fail to timely return complete documents, the Procurement Officer may determine that I am not responsible and therefore not eligible for contract award. If the contract has been awarded, the award is voidable.

I acknowledge that the MBE subcontractors/suppliers listed in the *MBE Participation Schedule* and any additional MBE subcontractor/suppliers identified in the *Subcontractor Project Participation Statement* will be used to accomplish the percentage of MBE participation that I intend to achieve.

In the solicitation of subcontract quotations or offers, MBE subcontractors were provided the same information and amount of time to respond as were non-MBE subcontractors.

The solicitation process was conducted in such a manner so as to not place MBE subcontractors at a competitive disadvantage to non-MBE 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	Affiant Signature
_____	_____
Address	Printed Name & Title
_____	_____
Address (continued)	Date

October 2017

ATTACHMENT B
MBE PARTICIPATION SCHEDULE REVISED

This document must be included with the bid or offer. If the bidder or offeror fails to submit this form with the bid or offer as required, the procurement officer shall deem the bid non- responsive or shall determine that the offer is not reasonably susceptible of being selected for award.

1. Prime Contractor's Name	2. Prime Contractor's Address/Telephone Number
3. Project/School Name: Monocacy Middle School Security Vestibule	4. Project/School Location: MOMS; 8009 Opossumtown Pike, Frederick MD 21702
5. LEA Name:. FCPS PSC Number:	6. Base Bid Amount $ _____ Acceptance Alternates $ _____ Total $ _____

7a.
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7b
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7c
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

8. MBE Total Amount	9. Total MBE Percent of Entire Contract
10. Form Prepared by: Name: _____ Title: _____ Date: _____	11. Reviewed and Accepted by Board of Edu. MBE Liaison Name: _____ Title: _____ Date _____

Total MBE Participation: $ _____ _____%
Total African-American Participation: $ _____ _____%
Total Asian-American MBE Participation: $ _____ _____%
Total Other Participation: $_____ _____%

ATTACHMENT B
MBE PARTICIPATION SCHEDULE REVISED

This document must be included with the bid or offer. If the bidder or offeror fails to submit this form with the bid or offer as required, the procurement officer shall deem the bid non- responsive or shall determine that the offer is not reasonably susceptible of being selected for award.

1. Prime Contractor's Name:	2. Prime Contractor's Address/Telephone Number
3. Project/School Name: Ballenger Creek Middle School Security Vestibule	4. Project/School Location: BCMS: 5525 Balllenger Creek Pike Frederick, MD 21703
5. LEA Name:. FCPS PSC Number:	6. Base Bid Amount $ _____ Acceptance Alternates $ _____ Total $ _____

7a.
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7b
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7c
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

8. MBE Total Amount	9. Total MBE Percent of Entire Contract
10. Form Prepared by: Name: _____ Title: _____ Date: _____	11. Reviewed and Accepted by Board of Edu. MBE Liaison Name: _____ Title: _____ Date _____

Total MBE Participation: $ _____ _____%
Total African-American Participation: $ _____ _____%
Total Asian-American MBE Participation: $ _____ _____%
Total Other Participation: $_____ _____%

ATTACHMENT B
MBE PARTICIPATION SCHEDULE REVISED

This document must be included with the bid or offer. If the bidder or offeror fails to submit this form with the bid or offer as required, the procurement officer shall deem the bid non- responsive or shall determine that the offer is not reasonably susceptible of being selected for award.

1. Prime Contractor's Name	2. Prime Contractor's Address/Telephone Number
3. Project/School Name: Catoctin High School Security Vestibule	4. Project/School Location: CHS: 14745 Sabillasville Road, Thurmont, MD 21788
5. LEA Name:. FCPS PSC Number:	6. Base Bid Amount $ _____ Acceptance Alternates $ _____ Total $ _____

7a.
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7b
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

7c
Minority Firm Name: _____
Minority Firm Address: _____ Telephone Number: _____
MDOT Firm Certification Number: _____ NAICS Code: _____
□African American □ Asian American □ Native American □ Women □ Hispanic □ Disabled

Subcontractor Firm (Select One)	Allowable Percentage	Percentage of Total Contract	Subcontractor Dollar Amount	Participation Amount
MDOT Certified Firm	100%		$	$
MDOT Certified Prime Contractor	50% of established goal OR 100% of one subgroup contract subgoal		$	$
MDOT Certified Supplier, Wholesaler and Regular Dealer	60%		$	$

8. MBE Total Amount	9. Total MBE Percent of Entire Contract
10. Form Prepared by: Name: _____ Title: _____ Date: _____	11. Reviewed and Accepted by Board of Edu. MBE Liaison Name: _____ Title: _____ Date _____

Total MBE Participation: $ _____ _____%
Total African-American Participation: $ _____ _____%
Total Asian-American MBE Participation: $ _____ _____%
Total Other Participation: $_____ _____%

MD COMAR 21.07.02.10 Performance and Payment Bond

Mandatory provision for all construction contracts exceeding $100,000:

A. Performance Bond. The required performance bond shall be in the form specified as follows:

PERFORMANCE BOND

_____ _____

Principal Business Address of Principal

_____

Surety a corporation of the State of _____and authorized to do business in the State of Maryland.

Bond Number _____ Penal Sum of Bond _____

(expressed in figures)

_____ Date Bond Executed _____ _____, 20___

(expressed in words)

The Board of Education of Frederick County 191 South East Street, Frederick MD. 21701-5918

Obligee Business Address of Obligee

Contract Description: Bid Number _____ Contract Date _____, 20___ Project Name: _____

_____

KNOW ALL MEN BY THESE PRESENTS, That we, the Principal named above and Surety named above, are held and firmly bound unto the Obligee named above in the Penal Sum of this Performance Bond stated above, for the payment of which Penal Sum we bind ourselves, our heirs, executors, administrators, personal representatives, successors, and assigns, jointly and severally, firmly by these presents. However, where Surety is composed of corporations acting as co-sureties, we the co-sureties, bind ourselves, our successors and assigns, in such Penal Sum jointly and severally as well as severally only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each co-surety binds itself, jointly and severally with the Principal, for the payment of such sum as appears above its name below, but if no limit of liability is indicated, the limit of such liability shall be the full amount of the Penal Sum.

WHEREAS, Principal has entered into or will enter into a contract with The Board of Education of Frederick County, which contract is described and dated as shown above, and incorporated herein by reference. The contract and all items incorporated into the contract, together with any and all changes, extensions of time, alterations, modifications, or additions to the contract or to the work to be performed thereunder or to the Plans, Specifications, and Special Provisions, or any of them, or to any other items incorporated into the contract shall hereinafter be referred as "the Contract."

WHEREAS, it is one of the conditions precedent to the final award of the Contract that these presents be executed.

NOW, THEREFORE, during the original term of said Contract, during any extensions thereto that may be granted by The Board of Education of Frederick County, and during the guarantee and warranty period, if any, required under the Contract, unless otherwise stated therein, this Performance Bond shall remain in full force and effect unless and until the following terms and conditions are met:

1 Principal shall well and truly perform the Contract; and
2 Principal and Surety shall comply with the terms and conditions in this Performance Bond.

Whenever Principal shall be declared by The Board of Education of Frederick County to be in default under the Contract, the Surety may, within 15 days after notice of default from The Board of Education of Frederick County, notify The Board of Education of Frederick County of its election to either promptly proceed to remedy the default or promptly proceed to complete the contract in accordance with and subject to its terms and conditions. In the event the Surety does not elect to exercise either of the above stated options, then The Board of Education of Frederick County thereupon shall have the remaining contract work completed, Surety to remain liable hereunder for all expenses of completion up to but not exceeding the penal sum stated above.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or

PERFORMANCE BOND CONTINUED

to the work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligation on this Performance Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

This Performance Bond shall be governed by and construed in accordance with the laws of the State of Maryland and any reference herein to Principal or Surety in the singular shall include all entities in the plural who or which are signatories under the Principal or Surety heading below.

IN WITNESS WHEREOF, Principal and Surety have set their hands and seals to this Performance Bond. If any individual is a signatory under the Principal heading below, then each such individual has signed below on his or her own behalf, has set forth below the name of the firm, if any, in whose name he or she is doing business, and has set forth below his or her title as a sole proprietor. If any partnership or joint venture is a signatory under the Principal heading below, then all members of each such partnership or joint venture, and each member has set forth below his or her title as a general partner, limited partner, or member of joint venture, whichever is applicable. If any corporation is a signatory under the Principal or Surety heading below, then each such corporation has caused the following: the corporation's name to be set forth below, a duly authorized representative of the corporation to affix below the corporation's seal and to attach hereto a notarized corporate resolution of power of attorney authorizing such action, and each such duly authorized representative to sign below and set forth below his or her title as a representative of the corporation. If any individual acts as a witness to any signature below, then each such individual has signed below and has set forth below his or her title as a witness. All of the above has been done as of the Date of Bond shown above.

In Presence of:
Witness

_____ as to

Individual Principal

_____ (SEAL)

In Presence of:
Witness

_____

Co-Partnership Principal

_____ (SEAL)
(Name of Co-Partnership)

_____ as to

By: _____(SEAL)

_____ as to

_____(SEAL)

_____ as to

_____(SEAL)

_____
(Name of Corporation)

_____

Attest:

Corporate Principal

_____ as to
(Corporate Secretary)

By: _____
(President)

AFFIX CORPORATE SEAL

PERFORMANCE BOND CONTINUED

(Individual or Corporate Surety)

Attest: (SEAL) By: (SEAL)

Title

(Signature)

(Bonding Agent's Name) (Name of Surety)

(Agent's Address) (Business Address of Surety)

Approved as to legal form and sufficiency this day of , 20

(Asst. Attorney General)

B. Payments Bond. The required Payments bond shall be in the form specified as follows:

PAYMENT BOND

(Principal) (Business Address of Principal)

Surety a corporation of the State of and authorized to do business in the State of Maryland

OR

an individual surety qualified in accordance with State Finance and Procurement Article, § 13-207 or 17-104, Annotated Code of Maryland.

Bond Number Penal Sum of Bond

(expressed in figures)

Date Bond Executed , 20

(expressed in words)

The Board of Education of Frederick County 191 South East Street, Frederick MD 21701

(Obligee) (Business Address of Obligee)

Contract Description: Bid Number # Contract Date , 20 Project Name:

BY THESE PRESENTS, That we, the Principal named above and Surety named above, being authorized to do business in Maryland, and having business address as shown above, are held and firmly bound unto the Obligee named above, for the use and benefit of claimants as hereinafter defined, in the Penal Sum of this Payment Bond stated above, for the payment of which Penal Sum we bind ourselves, our heirs, executors, administrators, personal representatives, successors, and assigns, jointly and severally, firmly by these co-sureties, bind ourselves, our successors and assigns, in such Penal Sum jointly and severally as well as severally only for the purpose of allowing a joint action or actions against any or all of us, and for all other purposes each co-surety binds itself, jointly and severally with the Principal, for the payment of such sum as appears above its name below, but if no limit of liability is indicated, the limit of such liability shall be the full amount of the Penal Sum.

MD COMAR 21.07.02.10 Performance and Payment Bond

PAYMENT BOND CONTINUED

WHEREAS, Principal has entered into or will enter into a contract with The Board of Education of Frederick County, which contract is described and dated as shown above, and incorporated herein by reference. The contract and all items incorporated into the contract, together with any and all changes, extensions of time, alterations, modifications, or additions to the contract or to the work to be performed thereunder or to the Plans, Specifications, and Special Provisions, or any of them, or to any other items incorporated into the contract shall hereinafter be referred to as the "Contract".

WHEREAS, it is one of the conditions precedent to the final award of the Contract that these presents be executed.

NOW THEREFORE, the condition of this obligation is such that if the Principal shall promptly make payment to all claimants as hereinafter defined, for all labor and materials furnished, supplied and reasonably required for use in the performance of the Contract, then this obligation shall be null and void; otherwise it shall remain in full force and effect, subject to the following conditions:

1. A claimant is defined to be any and all of those persons supplying labor and materials (including lessors of the equipment to the extent of the fair market value thereof) to the Principal or its subcontractors and subcontractors in the prosecution of the work provided for in the Contract, entitled to the protection provided by Section 17-101et. seq., State Finance and Procurement Article of the Annotated Code of Maryland, as from time to time amended.

2. The above named Principal and Surety hereby jointly and severally agree with the Obligee that every claimant as herein defined, who has not been in full may, pursuant to and when in compliance with the provisions of the aforesaid Section 9-113, sue on this Bond for the use of such claimant, prosecute the suit to final judgment for such sum or sums as may be justly due claimant and have execution thereon. The Obligee shall not be liable for the payment of any costs or expenses of any such suit.

The Surety hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Contract or to the work to be performed thereunder or the Specifications accompanying the same shall in any way affect its obligation on this Payment Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Contract or to the work or to the Specifications.

This Payment Bond shall be governed by and construed in accordance with the laws of the State of Maryland and any reference herein to Principal or Surety in the singular shall include all entities in the plural who or which are signatories under the Principal or Surety heading below.

IN WITNESS WHEREOF, Principal and Surety have set their hands and seals to this Payment Bond. If any individual is a signatory under the Principal heading below, then each such individual has signed below on his or her own behalf, has set forth below the name of the firm, if any, in whose name he or she is doing business, and has set forth below his or her title as a sole proprietor. If any partnership or joint venture is a signatory under the Principal heading below, then all members of each such partnership or joint venture have signed below, each member has set forth below the name of the partnership or joint venture, and each member has set forth below his or her title as a general partner, limited partner, or member of joint venture, whichever is applicable. If any corporation is a signatory under the Principal or Surety heading below, then each such corporation has caused the following: the corporation's name to be set forth below, a duly authorized representative of the corporation to affix below the corporation's seal and to attach hereto a notarized corporate resolution of power of attorney authorizing such action, and each such duly authorized representative to sign below and set forth below his or her title as a representative of the corporation. If any individual acts as a witness to any signature below, then each such individual has signed below and has set forth below his or her title as a witness. All of the above has been done as of the date shown above and in the presence of:

MD COMAR 21.07.02.10 Performance and Payment Bond

PAYMENT BOND CONTINUED

Witness _____ (Individual Principal) _____

_____ as to _____ (SEAL)

Witness _____ (Name of Co-Partnership) _____

_____ (SEAL)
(Co-Partnership Principal)

_____ as to By: _____ (SEAL)

_____ as to _____ (SEAL)

_____ as to _____ (SEAL)

_____
(Corporate Principal)

Attest: _____ (Name of Corporation) _____

_____ as to By: _____ AFFIX CORPORATE SEAL
(Corporate Secretary) (President)

_____
(Individual or Corporate Surety)

Attest: (SEAL) By: _____ (SEAL)

_____ Title _____
Signature

Bonding Agent's Name _____ (Business Address of Surety) _____

Agent's Address _____ (Business Address of Surety) _____

Approved as to legal form and sufficiency this _____ day of _____, 20__ _____
(Asst. Attorney General)

FREDERICK COUNTY PUBLIC SCHOOLS	Reg. No. 200-08
Subject: MINORITY BUSINESS ENTERPRISE PROCEDURES	**Issued:** 6/7/85
Preparing Office: Office of the Superintendent	**Amended:** 12/22/17

I. Policy 202.5

II. Procedures
MBE PROCEDURES FOR STATE-FUNDED PUBLIC SCHOOL CONSTRUCTION PROJECTS

BACKGROUND

In 1978, the Maryland General Assembly passed legislation, which was signed into law to establish the State's Minority Business Enterprise Program. This new law set as a goal that at least 10 percent of each unit of State government's total dollar value of procurement contracts for purchases and/or contracts is awarded to minority business enterprises. This law was subsequently modified and the goal was increased to 14 percent. More recently, in 2001, the goal was increased to 25 percent with subcontracting sub-goals of 7 percent for certified African American-owned businesses and 10 percent for certified women-owned businesses.

In 1979, the Rules, Regulations, and Procedures for the Administration of the School Construction Program were revised by the Board of Public Works to require each local board of education to adopt procedures to attempt to include minority business enterprises in State funded school construction projects. The State law was revised and now states: "The Interagency Committee on School Construction (IAC) shall require each local board of education to adopt procedures consistent with this chapter before obtaining funds for public school construction projects".

In May 2007, the Rules, Regulations, and Procedures were replaced by formal state regulations. The regulations concerning project procurement (COMAR 23.03.03) indicate that the State's minority business enterprise goals and procedures apply to all State funded projects, irrespective of procurement method.

In July 2011, a Sub-Goal Directive was issued by the Governor's Office of Minority Affairs (GOMA). This Directive established the process for setting contract by contract sub-goals. Sub-goals consistent with demonstrated underrepresentation were pre-established within the Directive.

OVERVIEW

This Minority Business Enterprise (MBE) procedure document was originally developed in response to a requirement set forth in the Rules, Regulations, and Procedures for the Administration of the School Construction Program. The MBE requirement was initially established under House Bill (HB) 64, which was passed in the 1978 session of the Maryland General Assembly and signed into law as Chapter 575 of the Acts of 1978.

Since the Board adopted its original Minority Business Enterprise Procedures, there have been changes in State statutes, regulations adopted by the Board of Public Works, procedural requirements, project eligibility requirements and the sub-goals to be set for school construction projects. This revised procedure is consistent with current legislation and the changes to the Code of Maryland Regulations (COMAR) requirements.

The revised procedures issued by GOMA in July 2011 provide guidance for establishing overall goals that are contract-specific and reasonable, and for setting sub-goals only on contracts that actually have subcontracting opportunities. The procedures for setting overall MBE goals have not changed, however once the overall goal is decided by the Procurement Review Group (PRG), the sub-goal analysis must be completed for contracts that have a total potential MBE participation over a minimum threshold amount, as defined for specific Major Industry Categories.

All activities funded through the Public School Construction Program (PSCP) fall within Construction in the Major Industry Categories. In place of the original goals of 7 percent for African American-owned businesses and 10 percent for certified women-owned businesses, the sub-goals for construction are now 7 percent for African American-owned businesses and 4 percent for Asian American-owned businesses. Sub-goals are not to be set for other minority groups which may be represented in the overall contract goal.

1.0 PURPOSE

The purpose of these procedures is to fulfill the intent of the law and the guidelines issued by GOMA by setting appropriate goals for minority business enterprise participation in every contract that includes State funding through the PSCP. Local Educational Agencies (LEAs) shall attempt to achieve the result that a minimum of 25 percent of the total dollar value of all construction contracts is made directly or indirectly with certified minority business enterprises when State PSCP funds are utilized, with a minimum of 7 percent from certified African American-owned businesses, a minimum of 4 percent from certified Asian American-owned businesses, and the balance from any certified minority business enterprises. All general contractors, including certified MBE firms, when bidding as general or prime contractors are required to attempt to achieve the MBE subcontracting goals from certified MBE firms.

2.0 EFFECTIVE DATE

These procedures have been adopted for use in Frederick County and supersede previously utilized MBE procedures, in accordance with Title 14, §3, State Finance and Procurement Article.

Note: All current attachments required for MBE participation can be found on the Public School Construction website: http://www.pscp.state.md.us/programs/mbe/mbeindex.cfm

3.0 DEFINITIONS

1. **Certification** means the determination that a legal entity is a minority business enterprise consistent with the intent of Subtitle 3 of the State Finance and Procurement Article.

2. **Certified Minority Business Enterprise** means a minority business that holds a certification issued by the Maryland State Department of Transportation (MDOT).

3. **Corporation**, as defined by MDOT, is an artificial person or legal entity created by or under the authority of the laws of any state of the United States, the District of Columbia or a territory or commonwealth of the United States and formed for the purpose of transacting business in the widest sense of that term, including not only trade and commerce, but also manufacturing, mining, banking, insurance, transportation and other forms of commercial or industry activity where the purpose of the organization is profit. For eligibility for certification, disadvantaged and/or minority individuals must own at least 51 percent of the voting stock and at least 51 percent of the aggregate of all classes of stock that have been issued by the corporation. (Note: stock held in trust is not considered as stock held by the disadvantaged businesspersons when computing the business person(s) ownership.)

4. **Managerial Control**, as defined by MDOT, means that a disadvantaged or minority owner(s) has the demonstrable ability to make independent and unilateral business decisions needed to guide the future and destiny of a business. Control may be demonstrated in many ways. For a minority owner to demonstrate control, the following examples are put forth, but are not intended to be all inclusive:

    a. Articles of Incorporation, Corporate Bylaws, Partnership Agreements and other agreements shall be free of restrictive language which would dilute the minority owner's control thereby preventing the minority owner from making those decisions which affect the destiny of a business;

    b. The minority owner shall be able to show clearly through production of documents the areas of the disadvantaged business owner's control, such as, but not limited to:

        1) Authority to sign payroll checks and letters of credit;
        2) Authority to negotiate and sign for insurance and/or bonds;
        3) Authority to negotiate for banking services, such as establishing lines of credit; and

4) Authority to negotiate and sign for contracts.

c. Agreements for support services that do not lessen the minority owner's control of the company are permitted as long as the disadvantaged or minority business owner's authority to manage the company is not restricted or impaired.

5. **Minority Business Enterprise** (MBE) means any legal entity, except a joint venture, that is (a) organized to engage in commercial transactions, and (b) at least 51 percent owned and controlled by one or more individuals who are socially and economically disadvantaged including: African Americans; American Indian/Native Americans; Asians; Hispanics; Physically or mentally disabled individuals; or, Women.

6. **Minority Business Enterprise Liaison** means the employee of the LEA designated to administer the Minority Business Enterprise Procedures for State funded public school construction projects.

7. **Operational Control, as defined by MDOT**, means that the disadvantaged or minority owner(s) must possess knowledge necessary to evaluate technical aspects of the business entity. The primary consideration in determining operational control and the extent to which the disadvantaged or minority owner(s) actually operates a business will rest upon the specialties of the industry of which the business is a part. The minority owner should have a working knowledge of the technical requirements needed to operate in his/her industry. Specifically, in the construction industry and especially among small (one to five person firms) contractors, it is reasonable to expect the disadvantaged or minority owner(s) to be knowledgeable of all aspects of the business. Accordingly, in order to clarify the level of operational involvement which a minority owner must have in a business for it to be considered eligible, the following examples are put forth, but are not intended to be all inclusive:

   a. The minority owner should have experience in the industry for which certification is being sought; and

   b. The minority owner should demonstrate that basic decisions pertaining to the daily operations of the business are independently made. This does not necessarily preclude the disadvantaged or minority owner(s) from seeking paid or unpaid advice and assistance. It does mean that the minority owner currently must possess the knowledge to weigh all advice given and to make an independent determination.

8. **Ownership**, as defined by MDOT, means that:

   a. The minority owner(s) of the firm shall not be subject to any formal or informal restrictions, which limit the customary discretion of the owner(s). There shall be no restrictions through, for example, charter requirements, by-law provisions, partnership agreements, franchise or distributor agreements or any other agreements that prevent the minority owner(s), without the cooperation or vote of any non-minority, from making a business decision of the firm.

   b. This means that the disadvantaged or minority persons, in order to acquire their ownership interests in the firm, have made real and substantial contributions of capital, expertise or other tangible personal assets derived from independently owned holdings without benefit of a transfer of assets, gift or inheritance from non-minority persons. Examples of insufficient contributions include a promise to contribute capital, a note payable to the firm or its owners who are not minority persons or the mere participation as an employee rather than as a manager. If the ownership interest held by a disadvantaged or minority person is subject to formal or informal restrictions, such as options, security interests, agreements, etc., held by a non-minority person or business entity, the options, security interests, agreements, etc., held by the non-minority person or business entity must not significantly impair the disadvantaged or minority person's ownership interest.

9. **Partnership** means an unincorporated association of two or more persons to carry on as co-owners of a business for profit. For a partnership to be deemed eligible for certification under the MDOT Program, the disadvantaged or minority person's interest must be at least 51 percent of the partnership capital.

10. **Disadvantaged Business Enterprise (DBE)** means a citizen or lawfully admitted permanent resident of the United States who is socially disadvantaged and economically disadvantaged. The law establishes the level of personal net worth at $1,500,000, adjusted annually for inflation according to the Consumer Price Index (CPI); above this net personal worth figure, an individual may not be found to be socially and economically disadvantaged. The current personal net worth (PNW) figure can be found on the MDOT website at: http://www.mdot.maryland.gov/Office%20of%20Minority%20Business%20Enterprise/Resources%20Information.

11. **Sole Proprietorship**, as defined by MDOT, is a for-profit business owned and operated by a disadvantaged or minority person in his or her individual capacity. For a sole proprietorship to be deemed eligible for certification under the DBE/MBE Program, the disadvantaged or minority person must be the sole proprietor.

12. **Days** mean business days unless otherwise specified. Business days are defined as Monday through and including Friday, with the exception of Nationally or State recognized holidays.

13. **Regular Dealer** is defined to be a firm that owns, operates, or maintains a store, warehouse, or any other establishment in which materials, supplies, articles, or equipment are of the general character described by the specifications required under the contract and are bought, kept in stock, or regularly sold or leased to the public in the usual course of business. A "regular dealer" does not include a packager, broker, manufacturer's representative, or any other person that arranges or expedites transactions.

4.0 MBE GOAL SETTING PROCEDURES

1. General

   a. The overall MBE goal and the sub-goals, if appropriate, are established on a per-contract basis for the purposes of solicitation.

      1) Where a project consists of more than one contract, the individual contract goals and sub-goals, if appropriate, should reflect the overall project goal and sub-goals.

      2) The words "if appropriate" and "if applicable" throughout this document reflect the understanding that for some solicitations, no African American or Asian American sub-goals should be established.

   b. The MBE program requires that all race-neutral measures be considered before making use of race-based measures. Using a combination of race-neutral and race-based measures for each specific school construction project will help ensure that certified MBE firms are afforded the opportunity to submit bids and be utilized to the greatest extent possible.

      1) *Race-neutral measures* include any action taken by the LEA to make it easier for all contractors, including MBEs, to compete successfully for public school construction project contracts. These might include widespread advertising of bidding opportunities, job fairs, and similar publicity events.

      2) *Race-based measures* include setting an overall MBE goal and MBE sub-goals, if appropriate, based upon race, gender, ethnicity, etc., for a specific contract.

2. General Considerations for Setting MBE Goal and Sub-goal. The overall MBE goal and the sub-goals, if appropriate, should be set for each specific project contract, considering but not limited to, the following factors:

   a. The extent to which the work to be performed can reasonably be segmented to allow for MBEs to participate in the project contract;

   b. A determination of the number of certified MBEs that potentially could perform the identified work;

c. The geographic location of the project in relationship to the identified certified MBEs;

d. Information obtained from other state and local departments/agencies related to establishing a MBE goal and/or sub-goals for similar construction projects or work in the jurisdiction;

e. A State agency may apply only 60% of the cost of materials and supplies provided by a regular dealer that is a certified MBE toward achieving an MBE contract goal. For materials or supplies purchased from a certified MBE that is neither a manufacturer nor a regular dealer, only the fees, commissions, or transportation charges related to the purchase can be counted toward achieving the MBE contract goal, if the agency determines that they are reasonable and not excessive; the actual cost of materials and supplies cannot be counted toward the MBE contract goals.

f. Information obtained from other state and local departments/agencies related to MBE participation in similar construction projects or work in the jurisdiction; and

g. Any other activities or information that may be identified as useful and productive.

h. Procurement agencies may not use quotas.

i. Procurement agencies may not use any project goal-setting process that:

1) Solely relies on the State's overall percentage goal, or any other jurisdiction's overall percentage goal; or

2) Fails to incorporate an analysis of:

- The potential subcontract opportunities available in the prime procurement contract;
- The availability of certified MBEs to respond competitively to the potential subcontract opportunities;
- Guidelines established by GOMA; and
- Other factors that contribute to constitutional goal setting.

3. MBE Sub-goal Setting Procedure:

a. Once an overall MBE participation goal is set for a project contract, each unit shall determine the appropriate contract sub-goals.

b. If the expected value of the procurement is not equal to or in excess of $200,000, the Sub-goal process is discretionary.

c. All State funded public school construction is classified as Construction in the Major Industry Category schedule established by regulation.

1) Accordingly, sub-goals for school construction projects receiving State funding participation apply to the following Subgroups:

- African American: 7%
- Asian American: 4%

2) Dually certified firms are to be counted as being owned by a member of the relevant ethnic Subgroup, not as a woman-owned business.

d. Sub-goals shall only be set when the overall goal is greater than or equal to the sum of the sub-goals listed in subsection 3.c.1 of this section, plus two percent (2%), i.e., the overall goal must be at least 13%; otherwise, no sub-goals may be established for the contract.

e. A sub-goal may not be set if the number of certified firms in the Subgroup is less than three (3).

f. If the Subgroup has three (3) or more certified firms available to perform the work, the Recommended Sub-goal should be set at the number specified above, unless a basis is provided in the Procurement Review Group documentation for not applying the specified sub-goal.

g. For each procurement that has an overall goal, the MBE Program Sub-goal Worksheet (Appendix I) shall be completed and signed by the LEA Procurement Officer and MBE Liaison.

4. The Superintendent or designee shall establish one or more procurement review groups (PRG). The PRG must include at a minimum the MBE liaison and the Procurement Officer (PO) or a representative from the procurement office. The PRG could also include a capital improvement project manager, the project architect, the cost estimator, the Construction Manager, and/or other individuals selected by the Superintendent or designee.

   a. The PRG should communicate and/or meet as needed to consider the subcontracting goal and sub-goals, if applicable, for individual projects or groups of projects.

   b. The PRG should consider the factors cited in 4.0, subsection 2, when establishing the MBE goal and sub-goals, if applicable, for each project or segmented piece of a project that are reasonable and attainable.

   c. The PRG must complete and submit a written analysis for each state funded school construction project with an estimated cost that is expected to exceed $200,000.

      1) For state-funded projects that required review of construction documents, the written analysis and the MBE Program Worksheet (Appendix I) shall be submitted with the construction documents to the Department of General Services (DGS), and will be reviewed by the DGS for submission, appropriate signatures and correspondence between the goal and sub-goals, if applicable, indicated in the analysis and those of the procurement documents.

      2) For state-funded projects that do not require review of construction documents, the written analysis and the MBE Program Worksheet shall be submitted to the PSCP, and will be reviewed for submission and appropriate signatures.

      3) For locally funded projects that are anticipating to be requested for state approval of planning and funding, the written analysis and the MBE Program Worksheet shall be submitted with construction documents to the Maryland State Department of Education (MSDE), and will be reviewed for submission, appropriate signatures, and correspondence between the goal and sub-goals, if applicable, indicated in the analysis and those of the procurement documents. Submission of the documents is a pre-condition for recommendation for state approval of planning and funding when submitted in an annual CIP.

      4) If the project cost is estimated to exceed $200,000 then a copy of the written analysis shall also be sent to GOMA at the same time that the written analysis is submitted to the DGS or the PSCP

   d. For projects estimated to cost between $50,000 and $200,000 the same analysis form is to be completed and submitted. This could be a responsibility of the PRG, but could be performed by others as well.

      1) For state-funded projects that require review of construction documents, the written analysis and the MBE Program Worksheet shall be submitted with the construction documents to the DGS, and will be reviewed for submission, appropriate signatures, and correspondence between the goal and sub-goals, if applicable, indicated in the analysis and those of the procurement documents.

      2) For state-funded projects that do not require review of construction documents, the written analysis and the MBE Program Worksheet shall be submitted to the PSCP and will be reviewed for submission and appropriate signatures.

   e. The PRG should consult with local counsel for the Board of Education as needed.

5. It is recognized that by utilizing the factors cited in Section 4.0, subsection 2, the MBE goal and/or sub-goals, if applicable, for a specific project or portion thereof may be significantly higher than the overall goals of the program (25% overall, with 7% from African American-owned businesses and 4% from Asian American-owned businesses). It is also recognized and possible that there will be MBE goals set that are lower than those stated above or even that no MBE goal and/or sub-goals will be set for a specific project or the segmented piece of the project.

6. Assistance in reviewing the factors cited above and setting a goal and/or sub-goals, if applicable, for specific projects or a segmented piece of a project can be obtained by contacting the PSCP and/or GOMA.

5.0 IMPLEMENTING PROCEDURES - $50,000 OR LESS

For construction projects estimated to cost $50,000 or less, the following procedures will be utilized:

1. A MBE goal and/or MBE sub-goals are not required to be set for contracts that are anticipated to be for $50,000 or less.

2. All advertisements, solicitations, and solicitation documents shall include the following statement:

   a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation."

3. To encourage greater MBE participation, the staff of the LEA should send out notices of potential projects and a specific project to MBEs to solicit bids or proposals directly from minority business enterprise contractors that are certified.

4. A copy of the solicitation notice, preferably electronically, shall be sent to GOMA at the same time the advertisement for the solicitation is released.

5. When a pre-bid or pre-proposal conference or meeting is held, the MBE liaison or designated representative shall explain that all bidders or offerors are encouraged to utilize certified MBEs for this project or segments of the project.

6. FCPS provides current solicitation packages on the FCPS website: http://www.fcps.org/bidlist. Large solicitation packages that contain drawings are available thru a third party electronic plan room.

7. Minority Business Enterprise forms identified in Section 6.0 of this procedure for projects over $50,000, are not required to be submitted for these projects ($50,000 or less).

8. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.

9. At the time of the contract award, the MBE Liaison or a designated person will record any anticipated certified minority business enterprise participation data made available from the successful contractor.

10. A business that presents itself as a minority business may participate in a project but may not be counted toward MBE participation until it is a certified minority business enterprise. If the MBE is not certified at the time of contract award, it may not be counted at that time. Only the funds paid after MDOT certification can be counted as MBE participation in the project. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article14-301 (F) and (J), Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.

11. The contractor will complete the Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, Minority Business Enterprise Participation, with each requisition submitted for payment. If certified MBE firms are known at the time of contract award, their names and other appropriate information should be entered on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them after approval by the LEA.

12. Upon completion of the project, the contractor will provide a summary of the total of all funds paid to certified MBE firms. This should be within the contractor's final requisition for payment. The summary shall be forwarded to the PSCP with the close-out paperwork.

6.0 IMPLEMENTING PROCEDURES - Over $50,000

For construction projects estimated to cost in excess of $50,000, the following procedures will be utilized:

1. All advertisements, solicitations, and solicitation documents shall include the following statements:

   a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice."

   b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the specific overall MBE goal of __ percent established for this project. All prime contractors, including certified MBE firms, when submitting bids or proposals as general or prime contractors, are required to attempt to achieve this goal from certified MBE firms."

   c. If sub-goals have been established for this project then one of the following should be included:

      1) "The sub-goals established for this project are __ percent from African American-owned businesses and __ percent from Asian American-owned businesses."

      2) "The sub-goal established for this project is __ percent from African American-owned businesses."

      3) "The sub-goal established for this project is __ percent from Asian American-owned businesses."

   d. "The bidder or offeror is required to submit with its bid or proposal a completed form "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" as described in the solicitation documents.

   e. If there are no overall MBE goal or MBE sub-goals established for the project, then only 1.A. above is to be included.

2. Other Advertisement and Outreach Requirements:

   a. To encourage greater MBE participation the staff of the LEA should send out notices of potential projects to MBEs or solicit bids or proposals directly from minority business enterprise contractors that are certified.

   b. A copy of the solicitation notice, preferably electronically, shall be sent to GOMA at the same time the advertisement for the solicitation is released.

   c. FCPS provides solicitation packages on the FCPS website: http://www.fcps.org/bidlist. Large solicitation packages that contain drawings are available thru a third party plan room.

   d. When a pre-bid or pre-proposal conference is held, the MBE Liaison or designated representative shall explain the MBE goal and sub-goals, if applicable; the MBE provisions of the solicitation; the documentation required at the time of submission; its relationship to the responsiveness of the bidder or offeror; how to complete the required schedules, and additional information and supporting documentation that may be required after the bid or proposal opening. All contractors who attend the pre-bid or pre-proposal conference should receive a list or information explaining how to obtain a listing of certified MBE firms who could perform the work or have expressed an interest in performing the school construction work required for the specific project in the jurisdiction.

   e. The names of prime contractors obtaining drawings and specifications will be shared with certified MBEs and MBE associations, upon request.

f. The MBE liaison, in conjunction with the procurement officer or project staff, should respond to all applicable questions and concerns relating to the project's MBE requirements, completely and in a timely fashion, to ensure that all potential contractors and subcontractors can compete effectively.

3. All Solicitation Documents Shall Include the Following:

a. "Certified Minority Business Enterprises are encouraged to respond to this solicitation notice". "All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors are required to attempt to achieve the MBE goal and sub-goals, if applicable, established for the project from certified MBEs".

b. "The contractor or supplier who provides materials, supplies, equipment and/or services for this construction project shall attempt to achieve the result that a minimum of __ percent of the total contract value is with certified Minority Business Enterprises, with a minimum of __ percent from certified African American-owned businesses, a minimum of __ percent from certified Asian American-owned businesses, and the balance from any certified Minority Business Enterprises. All contractors, including certified MBE firms, when submitting bids or proposals as prime contractors, are required to attempt to achieve the MBE goal and sub-goals, if applicable, from certified MBEs". Note: see 6.1.C. above for variations that may be required.

c. Each bid or offer submitted, including a submittal from a certified minority business enterprise in response to this solicitation, shall be accompanied by a completed "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" and a completed "MBE Participation Schedule". These two forms must be accurate and consistent with each other.

1) The forms shall be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document.

2) As an alternative, and at the discretion of the school system, the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" could be submitted with the sealed bid price or proposal at a place, date, and time specified in the solicitation document. The sealed bids or proposals received by the time specified could be held, unopened for a maximum of 30 minutes. Within that time (30 minutes) each bidder or offeror must submit the "MBE Participation Schedule" in a separate sealed envelope. The sealed price envelopes from each bidder or offeror who submits both the sealed bid or proposal and the envelope with "MBE Participation Schedule" will then be opened and reviewed and recorded as a viable submission. Any contractor that fails to submit the second envelope, with the "MBE Participation Schedule", prior to the specified time allowed (30 minutes) after the submittal of the sealed bid or proposal will be deemed non-responsive and the sealed bid or proposal will not be opened or considered.

d. The submittal of a completed and signed "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" and a completed and signed "MBE Participation Schedule" indicates the bidder's or offeror's recognition and commitment to attempt to achieve the MBE goal and/or MBE sub-goals, if applicable, for the specific project.

1) The bidder or offeror recognizes that their efforts made to initiate contact, to solicit, and to include MBE firms in this project will be reviewed carefully and evaluated based upon the actions taken by them prior to and up to 10 business days before the bid or proposal opening. Follow-up actions taken by the bidder or offeror within the 10 business days prior to the bid opening will also be considered.

2) Based upon this review and evaluation it will be determined, by the MBE liaison, procurement officer, or a designated person, if a good faith effort was made by the apparent low bidder or apparent successful offeror.

e. The bidder or offeror must check one of the three boxes on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" which relates to the level of MBE participation achieved for the project. The bidder's or offeror's signature indicates that in the event that they did not meet the MBE goal or sub-goals, if applicable, that:

   1) They are therefore requesting a waiver, and

   2) Documentation of their good faith efforts will be provided to the school system staff within 10 business days of being notified that they are the apparent low bidder or apparent successful offeror.

f. The bidder or offeror must submit the "MBE Participation Schedule" (as and when described above), which lists and provides information related to each certified MBE firm that the bidder or offeror will utilize on this project. A completed and accurate "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" is required. All of the work specified to be performed by each MBE firm, MDOT certification number, minority type, and percentages must be correct.

g. The "MBE Participation Schedule" should be completed and submitted with all calculations utilizing the base bid or offer only. A revised "MBE Participation Schedule" should be submitted by the successful bidder or offeror once a determination is made as to the acceptance and/or rejection of any alternates.

h. If a request for a waiver has been made, the appropriate box on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" has been checked and the form signed, then the LEA should obtain and review the apparent low bidder's or successful offeror's supporting documentation of the good faith efforts to justify the granting of the waiver, prior to submitting the contract award for approval to the board of education.

i. The following documentation shall be considered as part of the contract, and shall be furnished by the apparent low bidder or successful offeror to the MBE Liaison or designated person, within ten (10) business days from notification that the firm is the apparent low bidder or successful offeror:

   1) A completed and signed "Outreach Efforts Compliance Statement" and "Minority Business Enterprise Subcontractor Project Participation Statement". One "Minority Business Enterprise Subcontractor Project Participation Statement" shall be completed and signed by the prime contractor and each MBE firm listed on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit".

   2) Notification for purposes of this procedure means the earliest of the following methods of communication: orally in person, orally by telephone, orally by a telephone message, a faxed communication, a letter by date received or an electronic communication.

   3) The ten (10) business days do not include the day the notification is received, weekends or holidays (State or Federal), but the material submitted must be received by the close of business on the tenth day.

   4) The requirement to submit the above-listed documentation within the time frame specified will be considered by the IAC in its review of the request for contract award for the project. Failure to submit the required documentation within the time frame specified may result in a delay of the approval of the award of the contract, or the materials being returned without the approval of the award of the contract.

4. Waiver Procedures:

   a. If the apparent low bidder or successful offeror has determined that they are unable to meet the overall MBE goal or sub-goals, if applicable, for the project at the time of submission of a bid or offer, they must check either of the three boxes on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit". The signature recognizes and acknowledges that a request for a waiver is being made. The apparent low bidder or successful offeror will therefore be required

to submit information and substantiating documentation that will be reviewed to justify the granting of a waiver.

b. If the apparent low bidder or successful offeror is unable to achieve the overall MBE contract goal and/or the MBE sub-goals, if applicable, from certified African American-owned businesses and/or from certified Asian American-owned businesses, the apparent low bidder or successful offeror shall submit, within 10 working days from notification that the firm is the apparent low bidder or successful offeror, a completed "Outreach Efforts Compliance Statement", "Minority Subcontractors Unavailability Certificate" and "MBE Waiver Documentation" which shall include the following:

   1) A detailed statement of the efforts made by the bidder or offeror to identify and select portions of the work proposed to be performed by subcontractors in order to increase the likelihood of achieving the stated goal;

   2) A detailed statement of the efforts made by the bidder or offeror prior to and at least ten (10) days before the bid or proposal opening to solicit minority business enterprises through written notices that describe the categories of work for which subcontracting is being solicited, the type of work to be performed and specific instructions on how to submit a bid or proposal;

   3) Follow-up actions taken by the bidder or offeror within the 10 days prior to the bid or proposal opening will also be considered;

   4) A detailed statement of the contractor's efforts to make personal contact with MBE firms identified for item (2) above;

   5) A record of the name, address, telephone number and dates contacted for each MBE identified under items (2) and (3) above;

   6) A description of the information provided to MBEs regarding the drawings, specifications and the anticipated time schedule for portions of the work to be performed;

   7) Information on activities to assist minority business enterprises to fulfill bonding requirements or to obtain a waiver of these requirements;

   8) Information on activities to publicize contracting opportunities to minority business enterprises, attendance at pre-bid meetings or other meetings scheduled by the MBE Liaison or designated representative; and

   9) As to each MBE that placed a subcontract quotation or offer which the apparent low bidder or successful offeror considers not to be acceptable, a detailed statement of reasons for this conclusion.

c. In addition, to any waiver documentation, the apparent low bidder or successful offeror shall submit one completed "Minority Business Enterprises Subcontractor Project Participation Statement" for each MBE firm that will participate in the project consistent with the information previously provided at the time of the submission of the "MBE Participation Schedule" or the revised "MBE Participation Schedule".

d. A waiver of an MBE contract goal or sub-goal, if applicable, may be granted by the LEA only upon receipt of "Outreach Efforts Compliance Statement", "Minority Subcontractor Unavailability Certificate" and "MBE Waiver Documentation" as described above in 4. b. items 1 through 9.

   1) The MBE Liaison will review and accept or reject the minority business enterprise material that is submitted, and could obtain legal advice or assistance from their attorney.

2) The MBE waiver request may not be considered unless all of the documentation specified above has been submitted in a timely fashion by the apparent low bidder or successful offeror.

3) Assistance in the review of a request for a waiver (the documentation and justifications) may be requested from the Public School Construction Program and/or the Governor's Office of Minority Affairs.

4) If a determination is made that the apparent low bidder or successful offeror did make a good faith effort, based upon a review of the documentation submitted, then the waiver must be granted. The award of contract shall then be made. The material and information submitted including the LEA's review and analysis notes and conclusion shall be retained in the project file.

5) If a determination is made that the apparent low bidder or successful offeror did not make a good faith effort, based upon a review of the documentation submitted, then the waiver should not be granted. The material and information submitted including the LEA's review and analysis notes and conclusion shall be retained in the project file. The award of contract shall then be made to the next lowest bidder or offeror, who meets the contractual requirements, including the MBE requirements.

6) When a waiver is granted, a copy of "MBE Waiver Documentation" accepted and signed by a LEA representative and with the reasons for the determination, shall be forwarded to the Governor's Office of Minority Affairs and the Public School Construction Program within 10 days after approval of the contract award by the Board of Education. Failure to submit the required documentation within the time frame specified may result in delayed approval of the award of contract by the IAC.

5. All Contracts Shall Include The Following:

a. *The contractor shall perform the contract in accordance with the representations made in the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" and the "MBE Participation Schedule" submitted as part of the bid or proposal.*

b. *Failure to perform the contract as specified and presented in the bid or proposal submission without prior written consent of the owner shall constitute a violation of a material term of the contract.*

1) The contractor shall structure his/her operations for the performance of the contract to attempt to achieve the MBE goals as stated in the solicitation document.

2) The contractor agrees to use his/her best efforts to carry out these requirements consistent with the efficient and effective performance of the contract.

3) The contractor must ensure that all certified MBEs shall have the maximum practical opportunity to compete for additional subcontract work under the contract, even after the award of the contract.

4) The contractor shall submit monthly to the MBE Liaison or the s LEA's designated representative a report listing any unpaid invoices, over 30 days old, received from any certified MBE subcontractor, the amount of each invoice and the reason payment has not been made.

5) The contractor shall include in its agreements with its certified MBE subcontractors, a requirement that those subcontractors submit monthly to the MBE Liaison or appropriate representative a report that identifies the prime contract and lists all payments received from the contractor in the preceding 30 days, as well as any outstanding invoices, and the amount of those invoices.

6) The contractor shall cooperate in any reviews of the contractor's procedures and practices with respect to minority business enterprises, which the MBE Liaison, the PSCP, and/or GOMA may, from time to time, conduct.

7) The contractor shall maintain such records as are necessary to confirm compliance with its MBE participation obligations. These records must indicate the identity of certified minority and non-minority subcontractors employed on the contract, the type of work performed by each, and the actual dollar value of work performed. Subcontract agreements documenting the work performed by all MBE participants must be retained by the contractor and furnished to the MBE Liaison and or appropriate representative on request.

8) All records concerning MBE participation must be retained by the contractor for a period of five years after final completion of the contract, and will be available for inspection by the MBE Liaison, representatives from the PSCP and/or other designated official entities.

9) At the option of the MBE Liaison, or appropriate agency representative, upon completion of the contract and before final payment and/or release of retainage, the contractor shall submit a final report in affidavit form and under penalty of perjury, of all payments made to, or withheld from MBE subcontractors.

10) If at any time after submission of a bid or proposal and before execution of a contract, the apparent successful bidder or offeror determines that a certified MBE listed on its "MBE Participation Schedule" has become or will become unavailable, then the apparent successful bidder or offeror shall immediately notify the procurement officer and provide such officer with a reason(s) why the change has occurred. Any desired change in the "MBE Participation Schedule" shall be approved in advance by the procurement officer and shall indicate the contractor's efforts to substitute another certified MBE subcontractor to perform the work. Desired changes occurring after the date of contract execution may occur only upon written approval by the agency head and subsequently by contract amendment.

11) A business that presents itself as a minority business may participate in a project but the contract value may not be counted toward the MBE goal or sub-goals, if applicable, until the business is certified by MDOT. If it is not certified at the time of contract award it may not be counted toward the goal or sub-goals, if applicable, at that time. Only the funds paid after MDOT certification can be counted toward meeting the MBE goal or sub-goals, if applicable. If a certified MBE fails to meet the standards specified in State Finance and Procurement Article.14-301.1, Annotated Code of Maryland, the payments made to the MBE can be recorded and counted under a contract entered into when the MBE was eligible and certified. Ineligibility of an MBE to participate in the MBE program may not be the sole cause of the termination of the MBE contractual relationship for the remainder of the term of the contract.

12) Contractors are encouraged to seek additional MBE participation in their contracts during the life of the project. Any additional MBE participation from certified MBEs should be reported to the MBE liaison prior to initiation and should be included in subsequent monthly requisitions for payment.

13) The contractor shall complete the Certified Minority Business Participation Standard Monthly Contractor's Requisition for Payment (IAC/PSCP Form 306.4), specifically page 3 of 16, Minority Business Enterprise Participation, with each requisition submitted for payment this submittal should accurately reflect the payments to be made that month to MBEs and the cumulative total for the period specified. Any and all MBE firms that are identified on the "MBE Participation Schedule" should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.

14) At the completion of the project the contractor shall prepare a written summary of the final certified MBE participation in the contract as compared to the proposed participation at the time of contract award. This should include the name of each certified MBE, the percentage and amount that was anticipated to be paid at the time of contract award, the percentage and amount actually paid, and an explanation of any differences that have occurred. Special attention should be given to any situations where the final payments to any MBE were below the level of commitment at the time of contract award. The summary shall be forwarded to the LEA with the final requisition. The LEA shall include this documentation with the submittal of the close-out paperwork to the PSCP.

6. Projects Utilizing a Construction Manager Delivery Method

This section of the procedure has been prepared based upon the utilization of Construction Manager Agency method of delivery. If another alternative method of project delivery is being considered, then these procedures would need to be adapted in consultation with the PSCP before proceeding.

a. For projects that are being designed and solicited utilizing a Construction Manager Agency delivery method with multiple prime contracts, the LEA can structure its procedures to attain the overall MBE goal and sub-goals, if applicable, for the project as presented below:

b. The MBE liaison and other LEA staff should work with the project's construction manager, cost estimator, and architect, along with any other individuals who could provide assistance, to determine the overall MBE utilization strategy for the work required, appropriate bid packages, and an appropriate overall MBE goal and sub-goals, if applicable, for each specific bid or proposal package.

c. The overall MBE goal and sub-goals, if applicable, for the project shall represent the aggregate of the individual goals and sub-goals, if applicable, set for each bid or proposal package.

d. In setting the specific goals and sub-goals, if applicable, for each solicitation package consideration should be given to the potential for MBE participation to the maximum extent possible. The information and procedures provided in section 4.0 MBE Goal Setting Procedures should be consulted and followed for these types of projects.

e. Prior to submitting the construction documents for State review and authorization to solicit bids or proposals, the LEA's representative will prepare a complete list of the individual solicitation packages and indicate the MBE goal and sub-goals, if applicable, for each solicitation package. This would include the overall MBE goal and sub-goals, if applicable, established in the solicitation documents, the estimated cost for each solicitation package, and the estimated MBE dollar amounts for each solicitation package. A copy of this list should be submitted with the construction documents. The list should be retained as a record by the LEA for comparison to the actual contracts awarded with MBE participation, and the final actual MBE participation at the completion of the project.

f. Contractors submitting bids or proposals for solicitation packages that do not include a MBE goal and sub-goals, if applicable, would not be required to submit any of the MBE schedules that are otherwise required nor would they be required to indicate that they are requesting a waiver. The LEA representative would, however, request information from the contractor at the completion of the project to determine if any certified MBE firms had participated in the contract.

g. All other submittals of MBE materials and reporting requirements are applicable for the project, including the submittal of the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" and "MBE Participation Schedule" as described above in section 6.0. This includes the documentation for a request for a waiver, if applicable and appropriate.

7. Projects Utilizing an Indefinite Delivery/Indefinite Quantity (IDIQ) or Job Order Contracting (JOC) Method of Delivery:

a. The solicitation should be prepared and the overall MBE goal and sub-goals, if applicable, established based upon the type of work that is anticipated to be specified or performed under the contract and the availability of certified MBEs. This could include an analysis of the percentages of the different types of work, the estimated dollar value in the entire contract, and the availability of MBEs.

b. If an overall goal and sub-goals, if applicable, are set the bidders or offerors would be required to submit "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" in which they could indicate their anticipated MBE participation based upon the entire contract amount and the types of work specified. The award of contract can be made based upon their estimate of MBE participation since there is no specific task order or description of work to be performed and subcontractors have not been identified or engaged through any type of commitment or subcontract.

c. Since MBE participation is only anticipated in a general sense as an objective and specific contracts to MBEs have not been signed, then the contract award would not be included in any reporting to the PSCP or subsequent reporting to GOMA.

d. However, as the contract proceeds and individual task orders and/or purchase orders are issued, the contractor should submit the "MBE Participation Schedule" for any and all projects or work where MBE subcontractors and/or suppliers might reasonably be utilized. Discussions between the contractor or offeror and the LEA as the task orders and/or purchase orders are being developed should address this aspect of the contract requirements.

e. Any MBE participation should be recorded by the MBE liaison and reported to the PSCP as the task orders and/or purchase orders are approved.

f. The contractor shall complete the Certified Minority Business Participation Standard Monthly Contractor's Requisition for Payment (IAC/PSCP FORM 306.4), specifically page 3 of 16, Minority Business Enterprise Participation, with each requisition submitted for payment. This submittal should accurately reflect the payments to be made that month to MBEs, and the cumulative total for the period specified. Any and all MBE firms that are identified on the "MBE Participation Schedule" should be included on page 3 of the first and all subsequent requisitions for payment. Any MBEs identified during the life of the project should be added as soon as the contractor engages them.

g. At the completion of the contract period or the full utilization of the contract's value a report should be prepared by the LEA MBE Liaison and submitted to the PSCP summarizing the MBE participation in each and all of the task orders or purchase orders issued under the contract. This should include the anticipated MBE participation prior to the issuance of the solicitation, the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the contract. The summary shall be forwarded to the LEA with the final requisition. The LEA shall include this documentation with the submittal of the close-out paperwork to the PSCP.

8. Projects Utilizing the Design/Build Delivery Method:

a. The solicitation is for both A/E services and the actual construction of a public school project. The solicitation should be prepared and the MBE goal and sub-goals, if applicable, established for the construction work that is anticipated for the project. The goal setting procedures described in Section 4.0 above should be utilized for these types of projects.

b. The bidders or offerors should be required to submit "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" on which they would indicate their anticipated MBE participation based upon the construction work anticipated and their understanding of the MBE goal and sub-goals, if applicable, the types of work involved, and the availability of certified MBEs for the project. Since there are no detailed plans or designs for the project and there are no contracts or subcontracts for the actual construction work there is no need to submit any other MBE schedules, at this time.

c. If the bidder, or offeror, who is to be awarded this contract has indicated that they do not anticipate achieving the overall MBE participation goal and sub-goals, if applicable, for this project on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" then they are in effect requesting a waiver. They will be required to submit documentation at a later date to justify this request.

d. As the project proceeds through the design phase and the project is nearing the completion of the construction documents for submission to the State to review, the Design/Build Team (team) in consultation with LEA representatives should discuss the opportunities and potential for certified MBEs to participate in the project.

e. The team should begin to identify potential contractors and subcontractors, opportunities to segment the project, and MBEs that could participate in the project.

f. At a point in time that is approximately 30 days prior to the anticipated construction document submission to the State; the team should complete and submit a revised "MBE Participation Schedule" to the LEA for their review and approval.

g. If the team had indicated on the original "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" that they would meet the goals and the information on the "MBE Participation Schedule" indicates that they did meet the goals then the team should proceed with the construction of the project.

h. If the team had indicated on the "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit" that they did not anticipate meeting the overall MBE goal and sub-goals, if applicable, or only a portion of the goal and sub-goals, if applicable, then the "MBE Participation Schedule" should be reviewed by the LEA. The team should, at this time, submit their documentation in support of the waiver requested.

i. The proposed MBE participation should be reviewed and a determination made as to whether the team has made a good faith effort to meet the MBE goals and sub-goals, if applicable, established for the project and as stated on the revised "Certified Minority Business Enterprise Utilization and Fair Solicitation Affidavit".

j. If a request for a waiver is made and approved, "MBE Waiver Documentation" should be signed by a LEA representative and submitted to the PSCP and GOMA.

k. Since there was no MBE participation reported at the time of the award of the Design/Build contract, the LEA would submit the entire package of information, including all of the MBE related schedules to the PSCP within ten (10) days of the team being directed to proceed with the actual construction work.

l. All other submittals of MBE materials and reporting requirements are applicable for the project, as described above in Section 5.0.

7.0 RECORDS AND REPORTS

1. The MBE Liaison shall maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities. The records shall be maintained until the project is audited by the PSCP. These records shall include by project:

   a. The contractor report submitted at the completion of the project;

   b. The identity of the minority contractors employed on the project;

   c. The type of work performed;

   d. The actual dollar value of the work, services, supplies or equipment; and

e. The MBE percentage of the total contract.

2. The MBE Liaison will maintain a record of all waivers approved for each project or solicitation package where the prime contractor was unable to achieve the established overall goal or sub-goals, if applicable. The MBE Liaison will, however, report to the PSCP all MBE participation by MDOT certified firms who are prime contractors, subcontractors, suppliers, or otherwise making an economically viable contribution to each project. This information shall be reported to PSCP within ten (10) days after approval of the award of the contract by the board of education.

3. The LEA shall submit the "Certified Minority Business Enterprise Participation Standard Monthly Contractor's Requisition for Payment" (IAC/PSCP Form 306.4 page 3 of 16, located in the Administrative Procedures Guide), to the PSCP Director of Fiscal Services as part of the regular monthly request for payment for the project.

4. The LEA shall submit the "Close-Out Cost Summary" (IAC/PSCP Form 306.6 located in the Administrative Procedures Guide), along with the "Certified Minority Business Enterprise Participation Standard Monthly Contractor's Requisition for Payment" (IAC/PSCP Form 306.4) to the PSCP Director of Fiscal Services within 180 days of completion of the project.

   a. All final MBE payments should be verified by the LEA MBE Liaison before submission to the PSCP.

5. Each quarter and at the end of each fiscal year end, the LEA will submit to the, PSCP Fiscal Services a report "Payments Made to Contractors during The Fiscal Year" and maintain such records as are necessary to confirm compliance with its minority business enterprise procedures and activities.

6. Each fiscal year end, PSCP Fiscal Services will create a report "Projects Completed during the Fiscal Year" and maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities. This report will compare the overall MBE goal and sub-goals, if applicable, for each specific project with the MBE participation anticipated at the time of contract award and the actual MBE participation at the completion of the project.

8.0 MONITORING

1. The LEA's procurement personnel or project staff shall verify that the certified MBE's listed in the MBE participation schedule are actually performing the work.

2. The LEA's procurement personnel or project staff shall ensure that MBE subcontractors are receiving compensation as set forth in the "MBE Participation Schedule" by ensuring that the contractor submits monthly reports, listing any unpaid invoices over 30 days old received from any certified MBE subcontractor, the amount of each invoice, and the reason payment has not been made.

3. PSCP Fiscal Services will:

   a. Compile data on projects completed during the fiscal year;

   b. Confirm that all MBE subcontractors listed in the "MBE Participation Schedule" have received payment; and

   c. Maintain such records as are necessary to confirm compliance with its Minority Business Enterprise Procedures and activities.

4. The MBE Liaison and/or the PSCP will conduct reviews as deemed necessary to confirm compliance with the minority business enterprise participation requirements.

5. The MBE Liaison will maintain appropriate records, and shall assist the PSCP in on-site or post-audit reviews upon request.

6. Auditors from the PSCP will have access to and the ability to audit MBE participation for specific projects, information retained by the LEA, and/or submitted to the IAC in reports/forms filed by the LEA as referenced above.

9.0 MINORITY BUSINESS ENTERPRISE LIAISON

1. The Superintendent shall designate an individual to be identified as the MBE Liaison for the school system.

2. The MBE Liaison will be the contact person who will work with the PSCP and GOMA to implement the Minority Business Enterprise Program for the school system and the State of Maryland.

3. The Superintendent will immediately notify the PSCP if there is a change in the MBE Liaison for the school system.

10.0 PAYMENT/REIMBURSEMENT FOR ALL PSCP FUNDED PROGRAMS

1. Use IAC/PSCP Form 306.4 Page 3. ("Certified Minority Business Enterprise Participation Standard Monthly Contractor's Requisition for Payment")

2. The Prime Contractor must complete this Form and submit it with each Monthly Requisition/Invoice for Payment for each project in which they are seeking payment from either the Local Education Agency (LEA) or State of Maryland Public School Construction Program. If no MBE Sub-Contractors were utilized on a project (i.e., no MBE goals were set for the project and/or full waiver was granted), this Form must still be submitted by the Prime Contractor.

    a. IAC/PSCP Form 306.4 Page 3 must be PROJECT specific – If one bid/contract covers multiple projects (either different schools or scopes of work), this Form must be calculated and submitted by the Prime Contractor on an individual project basis.

    b. IAC/PSCP Form 306.4 Page 3 must be Prime Contractor/Trade Package specific – If the IAC recognized multiple Prime Contractors and/or Trade Packages, this Form must be completed by each Prime/Trade Contractor recognized by the IAC and submitted.

3. All ORIGINAL MBE Sub-Contractors must be listed on this Form with their full company name, MDOT Certification Number, MDOT Classification and ORIGINAL Contract Amount as stated on the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement". (ONLY MDOT Certified companies should be listed on this Form.)

4. Any additional MBE Sub-Contractors utilized on a project must be listed on this Form with their full company name, MDOT Certification Number, MDOT Classification and total contract amount. (ONLY MDOT Certified companies should be listed on this Form.)

5. The Prime Contractor should fill in the amount they intend to pay each MBE Sub-Contractor for the current requisition as well as all money paid to date. By signing this Form, the Prime Contractor is certifying their intent to pay the "Amount to be Paid This Requisition". They are also certifying the distribution of money listed under the "Total Paid to Date" column.

6. The LEA MBE Liaison shall verify each month with the MBE Sub-Contractors that all money listed under the "Total Paid to Date" column has been received from the Prime Contractor. By signing this Form, the LEA MBE Liaison is certifying all MBE Sub-Contractors have been paid all money due to them by the Prime Contractor.

7. The MBE Liaison should also be comparing the current Form with the prior month(s) to make sure information is not being duplicated and/or repeated. Payments to MBE Sub-Contractors should be progressive and recorded.

8. If for any reason, an amount the Prime Contractor listed on the Form as intending to pay the MBE Sub-Contractor was not made, or if the payment amount changed, the LEA MBE Liaison should be inquiring about the change in payment or non-payment to the MBE Sub-Contractor.

9. NO REQUESTS FOR PAYMENT/REIMBURSEMENT SHOULD BE SUBMITTED TO PSCP UNTIL THE PROCEDURES ABOVE HAVE BEEN COMPLETED.

11.0 CLOSE-OUT SUMMARY SUBMISSION

1. Use IAC/PSCP Form 306.6 ("Close Out Cost Summary").

2. The Prime Contractor must complete this Form and submit it with the FINAL Requisition (IAC/PSCP Form 306.4) to the LEA or upon LEA request. If no MBE Sub-Contractors were utilized on a project (i.e. no MBE goals were set for the project and/or a full waiver was granted), this Form must still be submitted by the Prime Contractor.

   a. IAC/PSCP Form 306.4 Page 3 must be PROJECT specific – If one bid/contract covers multiple projects (either different schools or scopes of work), this Form must be calculated and submitted by the Prime Contractor on an individual project basis.

   b. IAC/PSCP Form 306.4 Page 3 must be Prime Contractor/Trade Package specific – If the IAC recognized multiple Prime Contractors and/or Trade Packages, this Form must be completed by each Prime/Trade Contractor recognized by the IAC and submitted.

3. All ORIGINAL MBE Sub-Contractors must be listed on this Form with their full company name, MDOT Certification Number, MDOT Classification and ORIGINAL Contract Amount as stated on the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement" (ONLY MDOT Certified companies should be listed on this Form.)

4. Any additional MBE Sub-Contractors utilized on a project must be listed on this Form with their full company name, MDOT Certification Number, MDOT Classification and total contract amount. (ONLY MDOT Certified companies should be listed on this Form.)

5. The Final Form 306.4 should reflect ALL money paid to each MBE Sub-Contractor. There is a column on the Form to answer "Yes" or "No" for the MBE Sub-Contractor being paid in full. There is also a column on the Form for the Prime Contractor to state a brief reason if a MBE Sub-Contractor was paid less than the original contract amount stated on the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement". By signing this Form, the Prime Contractor is certifying the MBE Sub-Contractors have been paid in full for this project.

6. The LEA MBE Liaison shall verify with the MBE Sub-Contractors that all money listed under the "Total Paid to Date" column has been received and no additional money is owed to them by the Contractors have been paid in full by the Prime Contractor for this project.

7. NO CLOSE-OUT COST SUMMARY SHOULD BE SUBMITTED TO PSCP UNTILTHE ABOVE PROCEDURES HAVE BEEN COMPLETED.

<u>Additional Submission Requirements Applicable to All State Funded Projects</u>

1. If an ORIGINAL MBE Sub-Contractor listed on the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement" is not paid in full and/or not utilized on a project, the Prime Contractor shall submit in writing an explanation for either the reduction in contract amount/payment or why the MBE Sub-Contractor was not utilized.

2. It is the responsibility of the LEA MBE Liaison to contact the MBE Sub-Contractor to verify the explanation provided by the Prime Contractor. Any correspondence between the LEA MBE Liaison and both the Prime Contractor and MBE Sub-Contractors should be kept by the LEA and be made available to PSCP upon request or audit.

3. If an MBE Sub-Contractor originally listed on the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement" becomes unavailable and/or is not going to be utilized. This information should be communicated to the PSCP MBE Program Manager and the PSCP Finance Department by the LEA immediately.

4. If additional MBE Sub-Contractors are hired after the "MBE Participation Schedule" and "Minority Business Enterprises Subcontractor Project Participation Statement" have been submitted to PSCP, the LEA MBE Liaison must submit this information to the PSCP MBE Program Manager and the PSCP Finance Department immediately.

12.0 LIQUIDATED DAMAGES PROVISION FOR CONTRACTS CONTAINING MINORITY BUSINESS ENTERPRISE PARTICIPATION GOALS

Chapter 154, Laws of Maryland 2012 required the Board of Public Works (BPW) to promulgate a regulation that included a requirement that all contracts containing minority business enterprise participation goals contain a liquidated damages provision that applies in the event that the contractor fails to comply in good faith with the provisions of the Subtitle 11 of Title 21 or the pertinent terms of the applicable contract. See § 14-303(b) (5), State Finance and Procurement Article, Maryland Annotated Code (SFP).

The regulation promulgated by the BPW, effective May 13, 2013, states that: "All contracts containing certified MBE participation goals shall contain a liquidated damages provision that applies if the contractor fails to comply in good faith with the provisions of State MBE laws or the pertinent terms of the procurement contract." Code of Maryland Regulations (COMAR) 21.11.03.10(E).

Approved:

Original signed by

_____
Theresa R. Alban
Superintendent of Schools

Outreach Efforts Compliance Statement

****Complete and submit this form within 10 business days of notification of apparent award ****

In conjunction with the bid or offer submitted in response to Frederick County Public Schools for the solicitation for _____project, PSC#_____, I affirm the following:

1. Bidder/Offeror identified opportunities to subcontract in these specific work categories (extend list as needed):
   a. _____ d. _____
   b. _____ e. _____
   c. _____ f. _____

2. Attached to this form are copies of written solicitations (with bidding instructions) used to solicit certified MBEs for these subcontract opportunities.

3. Bidder/Offeror made the following attempts to contact personally the solicited certified MBEs (extend list as needed):
   a. _____
   b. _____
   c. _____
   _____

4. Select ONE of the following:

   a. ☐ This contract does not involve bonding requirements.
   OR
   b. ☐ Bidder/Offeror assisted certified MBEs to fulfill or seek waiver of bonding requirements (*describe efforts*).

5. Select ONE of the following:

   a. ☐ Bidder/Offeror did/did not attend the pre-bid/proposal conference.
   OR
   b. ☐ No pre-bid/proposal conference was held.

_____ By: _____
Bidder/Offeror Printed Name Signature: _____
Title: _____
Date: _____
Address: _____
_____
_____

October 2017

Attachment D

MINORITY BUSINESS ENTERPRISES SUBCONTRACTOR PROJECT PARTICIPATION STATEMENT

PROJECT/ SCHOOL NAME: _____

PROJECT/ SCHOOL LOCATION: _____

LEA: _____

NAME OF PRIME CONTRACTOR: _____

NAME OF MBE SUBCONTRACTOR: _____

_____ _____
MDOT Certification Number NAICS Code

1. Work/Services to be performed by MBE Subcontractor: _____

_____

2. Subcontract Amount: $ _____ Participation Amount $_____
3. Bonds - Amount and type required of Subcontractor if any: _____
4. MBE Anticipated or Actual Commencement Date: _____ Completion Date: _____
5. This MBE subcontract represents the following percentage of the total contract cost: _____
6. This is an African American Firm: Yes _____ No _____
7. This is an Asian American Firm: Yes _____ No _____
8. This is a Native American, Hispanic or Disabled Firm: Yes _____ No _____
(Circle One)

****

The undersigned subcontractor and prime contractor will enter into a contract for the work/service indicated above upon the prime contractor's execution of a contract for the above referenced project with the Board of Education. The undersigned subcontractor is a MDOT certified Minority Business Enterprise. The terms and conditions stated above are consistent with our agreements.

Signature of Subcontractor: _____

Date: _____

The term and conditions stated above are consistent with our agreements.

Signature of Prime Contractor: _____

Date: _____

MINORITY SUBCONTRACTOR UNAVAILABILITY CERTIFICATE

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 _____ school project

in _____ County by _____
(Name of Prime Contractor's Firm)

****

2. _____ (Minority Firm), is either unavailable for the

work/service or unable to prepare a bid for this project for the following reason(s):

_____

_____

_____

_____ _____ _____
Signature of Minority Firm's MBE Representative **Title** **Date**

_____ _____
MDOT Certification # Telephone #

3. To be completed by the prime contractor if Section 2 of this form is <u>not</u> completed by the minority firm.

To the best of my knowledge and belief, said Certified Minority Business Enterprise is either unavailable for the work/service for this project, is unable to prepare a bid, or did not respond to a request for a price proposal and has not completed the above portion of this submittal.

_____ _____ _____
Signature of Prime Contractor Title Date

October 2017

Attachment F

MBE WAIVER DOCUMENTATION

Project Name: _____ **PSC No.** _____

Base Contract Amount **$** _____

Plus Accepted Alternates **$** _____

Equals Total Contract Amount **$** _____

I have previously requested that a waiver be granted to the overall MBE goal for this project of _____ percent, with a minimum of ____ percent from certified African American-owned businesses, a minimum of ____ percent from certified Asian American-owned businesses, and the balance from all certified minority business enterprises, if applicable. This would include the total dollar value of all materials, supplies, equipment, and services, including construction services directly or indirectly, from Minority Business Enterprises (MBE) which are currently certified by the Maryland Department of Transportation (MDOT).

I _____ **, hereby certify that my position is**
(Name of Company Representative)

_____ **, and I am the duly authorized representative of**
(Position Title)

_____ .
(Company Name)

I further certify that I have submitted a *Schedule for Participation of Certified Minority Business Enterprises* which reflects the percentage and dollar value of certified Minority Business Enterprise participation which my company expects to achieve for this contract. Therefore, the request for the waiver is as follows:

Summary MBE Participation Schedule from Attachment B

Minority Group	MBE GOAL		Actual MBE Participation		Request For Waiver	
	Dollar Value of Total Contract*	Percent of Total Contract	Dollar Value	Percent of Total Contract	Dollar Value	Percent of Total Contract
a. Sub Goal African American						
b. Sub Goal Asian American						
c. Other * in Sub Goal group a/b above						
TOTALS						

*** with accepted/rejected alternates**

To support this request for a waiver, I include the following information as attachments which I certify to be true to the best of my knowledge.

1. **A detailed statement of the efforts made by the contractor to identify and select portions of the work proposed to be performed by subcontractors in order to increase the likelihood of achieving the stated goal;**

2. **A detailed statement of the efforts made by the contractor *prior to and up to 10 days before the bid opening* to solicit minority business enterprises through written notices that describe the categories of work for which subcontracting is being solicited, the type of work to be performed, and specific instructions on how to submit a bid;**

3. **A detailed statement of the contractor's efforts to make personal contact with MBE firms identified for Item 2. above;**

4. **A record of the name, address, telephone number, and dates contacted for each MBE identified under items 2. and 3. above;**

5. **A description of the information provided to MBE's regarding the plans, specifications and the anticipated time schedule for portions of the work to be performed;**

6. **Information on activities to assist minority business enterprises to fulfill bonding requirements, or to obtain a waiver of these requirements;**

7. **Information on activities to publicize contracting opportunities to minority business enterprises, attendance at pre-bid meetings, or other meetings scheduled by the MBE Liaison or designated representative;**

8. **As to each MBE that placed a subcontract quotation or offer which the apparent low bidder or successful offeror considers not to be acceptable, a detailed statement of reasons for this conclusion; and**

9. **A list of minority subcontractors found to be unavailable. This shall be accompanied by a *Minority Subcontractor Unavailability Certificate* signed by the minority business enterprise or from the apparent low bidder or successful offeror indicating that the minority business did not provide the written certification.**

Signature _____ **Date** _____
(Company Representative Name)

Sworn and subscribed before me this _____ **day.**

of _____ **in the year** _____ **Notary Public** _____

Reviewed and accepted by the _____ **County Board of Education MBE Liaison.**
(County Name)

Signature _____ **Date** _____
(County Representative Name)

IAC/PSCP FORM 306.4

Attachment G

CERTIFIED MINORITY BUSINESS ENTERPRISE PARTICIPATION

STANDARD MONTHLY CONTRACTOR'S REQUISITION FOR PAYMENT

LEA: _____ **DATE:** _____

FACILITY NAME: _____ **PSC NO:** _____

SCOPE OF WORK: _____ **REQ NO:** _____

Name of MBE Sub-Contractor	MDOT Certification Number and Classification	TOTAL MBE Contract Amount	Amount to be Paid THIS Requisition	TOTAL Paid to Date	MBE has Received FINAL Payment?	If amount paid is LESS than TOTAL MBE Contract Amount, EXPLAIN VARIANCE
	TOTAL:	**$**	**$**	**$**		

MDOT Certification Number and Classification can be located at http://mbe.state.mdot.state.md.us/diretory/

MBE Classification :

African American = AA
Hispanic American = H
Native American = N
Asian American = A
Women = W
African American/Women = AAW
Hispanic American/Women = HW
Native American/Women = NW
Asian American/Women = AW

I certify that the figures and information presented above represent accurate and true statements that timely payments have been and will be, made to suppliers and subcontractors on the project, as requisitioned payments are received, and in accordance with our contracts.

_____ _____

Name of Contractor Firm — Authorized Contractor Signature/Date

_____ _____

Contractor Federal Tax ID# — Contractor MBE Classification # (if applicable)

_____ _____

Name of LEA MBE Liaison (Printed) — Signature of LEA MBE Liaison/Date

Attachment H

IAC/PSCP FORM 306.6

CLOSE-OUT COST SUMMARY

LEA: _____ DATE: _____

SCHOOL NAME: _____ PSC # : _____

	Public School Construction	Local and Other
Allocation:		
Cash Disbursements:		

	Approved Contracts	Expenditures	Balance	Approved Contracts	Expenditures	Total Expenditures
Construction			$0			.
A/E			$0			$0
Related Costs			$0			$0
Total	$0	$0	$0	$0	$0	$0

I hereby certify that the data shown hereon is correct and request this project be closed.

_____
Signature of LEA Representative

FOR STATE USE ONLY

ADJUSTMENTS:

Allocation: _____

Cash: _____

Initials	
Date	

AUDIT COMMENTS:

Initials	
Date	

Revised 7/1/00

MBE PROGRAM SUBGOAL WORKSHEET – Appendix I

This Worksheet must be completed for all procurements that have an overall goal. It requires the approval of the Procurement Officer and the MBE Liaison, who also must sign the Worksheet. Each unit must maintain a copy of the Worksheet as a part of the Procurement Review Group (PRG) documentation for the procurement.

Agency/Unit:	
Project Description:	Solicitation No.
Approvals: _____ _____ Signature of Procurement Officer Date ~~Signature of MBE Liaison~~ ~~Date~~	
1. What is the expected value of the procurement (excluding options)?	$
2. Does the expected value of the procurement equal or exceed $200,000?	( ) Yes ( ) No
☑ If **YES**, completion of the rest of this Worksheet to determine the appropriate subgoals, if any, is mandatory. ☑ If **NO**, the unit may, at its discretion, determine that subgoals will not be set for the procurement. If, however, the unit determines that subgoals should be set, the rest of this Worksheet must be completed to determine the appropriate subgoals, if any.	
3. Select, from Table 1 below, the Major Industry Category for the procurement based on the definitions in COMAR 21.01.02.01.	
4. What is the Combined Industry Category, from Table 1 below, based on the Major Industry Category selected for the procurement in Step 3?	

TABLE 1 – INDUSTRY CATEGORY CONVERSION CHART

Major Industry Category	**Combined Industry Category**
Architectural & Engineering	AE-CRS
Construction	Cons
Construction Related Services	AE-CRS
Human, Cultural, Social & Educational Services	Serv
IT Services	IT IT
IT Supplies & Equipment	Main
Maintenance	Serv
Services	CSE
Supplies & Equipment	

5. Check the appropriate column for the Combined Industry Category in Table 2 below based on the answer to Step 4.	
6. What is the Subgoal Total Plus 2% Margin shown in the last line of Table 2 below for the Combined Industry Category?	%
7. What is the overall MBE participation goal for the procurement?	%
8. Does the overall MBE participation goal for the procurement equal or exceed the Subgoal Total Plus 2% Margin? (Compare Steps 6 and 7)	( ) Yes ( ) No
☑ If **YES**, proceed with the remaining steps in this Worksheet. ☑ If **NO**, do not set any subgoals for the procurement.	
9. For Column 9 in Table 2, insert the number of certified firms available to perform the work of the procurement for each Subgroup that has a Recommended Subgoal. (NOTE: For purposes of determining the number of certified firms in a Subgroup, count dually certified firms as being owned by a member of the relevant racial or ethnic Subgroup, not as a woman-owned firm.)	
10. For column 10 in Table 2, insert a "Y" (for Yes) or "N" (for No) to indicate whether the number of certified firms in a Subgroup that has a Recommended Subgoal equals or exceeds 3 firms.	

TABLE 2 – RECOMMENDED SUBGOALS

Combined Industry Category (Check appropriate column per Step 5.)			**Cons** ☐	**AE-CRS** ☐	**Main** ☐	**IT** ☐	**Serv** ☐	**CSE** ☐
9. # of Firms	**10. ≥ 3 Y/N**	**Subgroups**						
		African American	7%	6%	8%	7%	7%	6%
		Hispanic American	—	2%	3%	2%	—	—
		Asian American	4%	—	3%	—	4%	5%
		Women	—	9%	—	8%	12%	10%
Subgoal Total			11%	17%	14%	17%	23%	21%
Subgoal Total Plus 2% Margin			**13%**	**19%**	**16%**	**19%**	**25%**	**23%**

***The *Subgoal Total Plus 2% Margin* is the sum of the Recommended Subgoals plus 2%.**

☑ **Refer to Table 2 above. If there are 3 or more certified firms in a Subgroup for the work of the procurement (indicated by a "Y" in Column 10), the Recommended Subgoal for the Combined Industry Category in Table 2 should be set for that Subgroup unless an explanation is provided in Step 11.**

☑ **A subgoal may not be set if the number of certified firms in that Subgroup is less than 3 (indicated by an "N" in Column 10).**

11. The following Recommended Subgoals have not been set because:

New Security Vestibule at

Monocacy Middle School

Opossumtown Pike –
Frederick, Maryland

May 15, 2018

Bidding Documents
FCPS Bid #??

TABLE OF CONTENTS

New Security Vestibule for
Monocacy Middle School
Frederick, Maryland

Proj. #15-30.03 Construction Documents

GENERAL REQUIREMENTS

TECHNICAL SECTIONS

MECHANICAL/ELECTRICAL/PLUMBING SECTIONS

SECTION 01 10 00

GENERAL REQUIREMENTS

SECTION 01 10 00 - GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY OF WORK

Furnish all labor, materials, equipment, and services necessary for, incidental to, the construction of a Security Vestibule at the interior of Monocacy Middle School. All work shall be bid as lump sum as indicated on the drawing and specifications as prepared by Proffitt and Associates. Work shall be coordinated with the Owner. Work is to be completed at a time frame dictated by the Owner's Representative when the area will be available for work. Work is further described as follows:

A. The existing school building consists of a single story structure with steel frame and non-load bearing masonry construction.

Work includes removal of interior hollow metal doors/frames and windows and partial removal of non-bearing masonry walls as shown on the drawings. The new vestibule compartment will be primarily constructed with an aluminum storefront system with entrance doors and side lights. Work associated with secondary finishes systems such as gypsum board on metal studs, flooring, painting, and acoustical ceilings will also be included.

Work also includes installation of access control door hardware and associated security devices.

Minor modifications to Mechanical and Electrical systems to support the vestibule and associated upgrades to the existing Admin. Office is required.

Additional Structural and Masonry work is not required.

B. All work is indicated on the contract documents and is limited to Architectural work with some minor Mechanical and Electrical work**.**

1. Contractor shall provide a detailed schedule of values for all work included in the project broken down by trade.

C. The Owner will continue to conduct limited operations in this facility during construction and renovation. The General Contractor shall coordinate all phasing aspects with the owner to ensure that existing public areas and egress components can be used to the greatest extent possible during construction operations, and to maintain building security.

1.2 LOCAL CONDITIONS

A. The contractor shall check, measure and verify all site conditions and be responsible for familiarizing themselves with the nature, extent and quantity of the work. Where drawings or specifications conflict with existing field conditions, Contractor shall

notify the Owner's Representative. The Owner will then give written directions and or clarifications on how to proceed.

B. The Contractor is responsible for verification of all utility locations and the repair of same if damaged during construction. The Contractor shall restore to the original condition all damages due to construction.

1.3 APPLICABLE CODES AND STANDARDS

A. All work shall conform to all applicable local, state or federal building codes, regulations and 2010 A.D.A. regulatory requirements.

1.4 INQUIRIES

A. All inquiries pertaining to this project shall be made to Mr. Brad Ahalt, Project Manager for FCPS Construct Management Dept, Frederick County Public Schools, phone 301-644-5164. Email: bradley.ahalt@fcps.org.

1. Mr. Brad Ahalt will serve as the Owner's Representative.

B. The site is available for inspection prior to bid by calling the Project Manager to make arrangements to coordinate a site visit that doesn't interfere with business activities.

1.5 OPENING

A. Proposals will be opened as announced in the "Invitation to Bid."

1.6 AWARD OF BID

A. The Contract will be awarded as stated in the "Instructions to Bidders."
In addition, Frederick County Public Schools reserves the right to accept or reject any or all proposals for any reason whatsoever and will not be responsible for any charges incurred by contractors.

1.7 SCHEDULE OF WORK

A. Demolition/construction work to begin on or about June ??, 2018 with substantial completion of base bid work by August ??, 2018. Final completion date of base bid work is September ??, 2018.

B. The contractor has full access to the building as necessary during the above timeline 7 days a week and as allowed by local ordinances. Once staff return for the fall term access will be restricted to comply with the instructional schedule.

C. FCPS is on 4 day 10 hour work week over the summer recess; there will be no staff on site Friday, Saturday or Sunday from mid-June to Mid-August however FCPS will make accommodations for access during those days as necessary.

1.8 LIQUIDATED DAMAGES

A. Liquidated damages in the amount of $475.00 per day for each calendar day beyond completion date of August ??, 2018 will be assessed by the Owner.

1.9 SPECIAL CONDITIONS

A. Asbestos- Containing Buildings:
Although, most Frederick County Public School buildings contain asbestos, it is not anticipated that any ACM's (Asbestos Containing Materials) will be encountered as part of this work. At the pre-construction meeting a detailed procedure of asbestos removal (should any be encountered in the building) will be given to the contractor.

B. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. Use adequate but reasonable precautions to prevent the spread of dust, dirt and noise to adjacent areas.

1.10 PERMITS AND INSPECTIONS

A. If applicable, the Owner shall obtain and pay for the primary building permit for this project. However, the Contractor shall obtain and pay for all secondary trade permits and inspection fees required for all local, state or federal applicable codes.

B. The Contractor shall supply the Owner with a copy of all permits and inspection reports.

1.11 CUTTING AND PATCHING

A. Saw-Cut to fit, patch to match all existing surfaces which are cut for installation of new materials and equipment or the demolition of existing materials. No cutting or patching of utilities or other structures shall be done without the specific permission of the Owner.

1.12 PROJECT COORDINATION AND MEETINGS

A. Coordination: Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

B. Meetings:

1. A pre-bid meeting will be held at the Monocacy Middle School as described in the invitation for bids.

2. A pre-construction meeting will be held after the project is awarded and before construction begins.

3. Progress meetings will be held as deemed necessary by the Owner but not less than one meeting every two weeks.

1.13 SUBMITTALS

A. General: Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities and as noted in other sections of these specifications. Transmit in advance of performance of related activities to avoid delay. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.

1. All submittals shall include, but not be limited to, name and address or contractor, name and address of subcontractor, name and address of supplier and name of manufacturer. If applicable all submittals shall show compliance with recognized trade association standards and recognized testing agency standards with appropriate labels and seals.

B. Shop Drawings: The Contractor shall submit for approval three (3) copies of shop drawings or submittals for all phases of construction and materials to be used.

C. Product Data: Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information.

D. Samples: Submit two (2) samples of each system component.

1.14 QUALITY CONTROL

A. Responsibilities: The Contractor is to provide inspections and tests specified or required by governing authorities, and as indicated in other sections of these specifications. Costs are included in the Contract.

B. Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents.

C. Coordination: The Contractor is responsible for scheduling inspections, tests, and similar activities.

D. Submittals: The Contractor shall submit a certified written report of each inspection and test in duplicate.

1.15 CONTRACTOR USE OF PREMISES

A. Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

B. Confine operations to areas within contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

C. Keep driveways and entrances clear at all times. Do not use these areas for parking or storage of materials. After completion date of August ??, 2018 no materials will be stored at the site.

D. Use of the Existing Building: Maintain the existing building in an operational condition throughout construction. Repair damage caused by construction operations. Take precautions necessary to protect the building and occupants during the construction period.

E. Full Owner Occupancy: The Owner will occupy the site and existing building during construction. Cooperate with the Owner to minimize conflicts and facilitate Owner usage. Perform the work so as not to interfere with the Owner's operations.

1.16 RECORD AND OPERATIONS & MAINTENANCE DATA

A. If not indicated in other parts of these specifications provide the following as indicated. Record Document Submittals, Record Drawings, Record Specifications, Maintenance Manuals, Operating and Maintenance Instructions and As-Built Drawings.

1. Record Document Submittals: Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the Owner's reference.

2. Record Drawings: ("As-Builts") Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark-up these drawings to show the actual installation. Mark whichever drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

a. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.

3. Additional Record Drawings:
At the completion of the project, the Contractor shall obtain an AutoCAD drawing file (i.e. floor plan, site plan) from the Engineer and update the file from the "as-built" drawings. The updated AutoCAD file shall be returned to the Engineer for his review, then released to the Owner at the completion of the project.

4. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.

5. Maintenance Manuals: Organize maintenance data into three (3) sets of manageable size. Bind in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. This shall include but is not limited to the following information:

   Emergency instructions.
   Spare parts list.
   Copies of warranties.
   Wiring diagrams.
   Inspection procedures.
   Shop Drawings and Product Data.

6. Operating and Maintenance Instructions: Arrange for the Manufacturer's Representative and Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. This shall include but is not limited to a detailed review of the following:

   Maintenance manuals.
   Spare parts and materials.
   Control sequences.
   Hazards.
   Warranties and bonds.
   Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

   Start-up and shutdown.
   Emergency operations.
   Safety procedures.

1.17 WARRANTY

A. In submitting a proposal, each bidder thereby represents that he will, upon award of the contract, guarantee in writing all materials and workmanship for a period of Two (2) years from date of substantial completion. During the guarantee period the Contractor will be required, within a reasonable length of time after receipt of written notice by the Owner, to make good any defects in materials or workmanship which may have developed and to make good any damage to other work caused by such defects or the repairing of the same, at his own expense and without cost to the Owner.

b. If a bidder cannot guarantee any material, construction and equipment that is shown or specified, or if he cannot furnish any surety bond that may be required, then it shall be so stated in his proposal, and unless this is done, it shall be understood that the bidder accepts all of the guarantee conditions called for, and he shall be bound thereto upon award of the contract. If the Owner should consent to waive any requirements in this respect, then it shall have effect only if such waiver is expressly set forth in the signed contract agreement.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock.

B. "Materials" are products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

D. Product Delivery, Storage, and Handling: Deliver, store and handle products in accordance with manufacturer's recommendations, using methods that will prevent damage, deterioration and loss.

E. Materials Storage and On-Site-Work: The Contractor shall maintain the site in a clean, neat and orderly manner at all times. Materials may be stored at the school in a designated site agreed to by both the Contractor and the Owner's project manager.

F. Installation of Products: Comply with manufacturer's instructions and recommendations for installation of products. Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Removal of Existing Products, Materials or Equipment: The Contractor shall "Remove" all existing products, materials or equipment as designated in the summary of work and as indicated in other sections of these specifications. The contractor shall be responsible for the disposal of these items at no cost to the owner.

PART 3 – EXECUTION

3.1 PROJECT CLOSEOUT

A. Substantial Completion: Before requesting inspection for certification of Substantial Completion, complete the following:

1. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

2. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar record information.

3. Change-over permanent locks and transmit keys to the Owner.

4. Complete start-up testing of systems, and instruction of the Owner's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

5. Complete final clean up. Touch-up and repair and restore marred exposed finishes.

6. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.

B. Site Restoration:

1. The Contractor shall be responsible for repairs to the grounds, building and/or blacktop due to traffic and/or the storage of materials. Repairs shall be made to the satisfaction of the Owner's representative and shall equal the original conditions.

C. Final Cleaning: Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following before requesting inspection for certification of Substantial Completion:

1. Remove labels that are not permanent labels.

2. Clean transparent materials.

3. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps. Clean the site of rubbish, litter and other foreign substances. Sweep paved areas; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

D. Removal of Protection: Remove temporary protection and facilities.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

(END OF SECTION)

SECTION 01 21 00

ALLOWANCES

A. GENERAL:

1. Each Bidder shall carry separately in the Base Bid sum (except where noted below) a cash allowance as follows, for unforeseen conditions and items of work to be selected by the Owner during the course of construction. The allowance is for the purchase of materials, equipment, labor and installation, overhead and profit, and other handling costs. If additional work associated with an allowance is requested by the Owner (above the stated quantity), the Contractor can be entitled to extra compensation based on the quantity of additional work multiplied by a negotiated unit price for that work item. If at the end of the project a balance remains on any allowance amount, the remaining portion will be credited back to the Owner based on the quantity remaining multiplied by the negotiated unit price for that work item.

B. ALLOWANCES:

1. Contractor shall include the following items or amounts in the **Base Bid** as described below:

Allowance A - The following work items will be included in the Base Bid as an Allowance:
Include amount of…… …. …….. $??.00

2. The contractor shall coordinate Subcontractors as required for work items noted above in order to ensure that all work is completed in a timely and efficient manner.

– END OF SECTION 01 21 00 –

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Definitions and Explanations: "Alternates" are defined as alternate products, materials, equipment systems, methods, units of work for major elements of construction, which may, at Owner's option be selected for work in lieu of corresponding requirements of Contract Documents.

1. Alternates may or may not change scope and general character of work substantially.

B. Accepted Alternates: Refer to Owner-Contractor Agreement and subsequent modifications thereof (if any) for determination of which alternates listed have been accepted, and are, therefore, in full force and effect as though originally included in Contract Documents for base bid.

C. Notification: Immediately following award of contract, prepare and distribute to each entity or person to be involved in performance of work, notification of status of each alternate scheduled and including those subsequently added by notification during bidding. Indicate which alternates have been: 1) accepted, 2) rejected, and deferred for consideration at later date as indicated. Include full description of negotiated modifications to alternates, if any.

D. Requirements of the General Conditions, Supplementary Conditions and Division I of these specifications apply to this section.

E. The work under these Alternates shall be performed in accordance with the applicable Sections of these specifications.

1.2 GENERAL ALTERNATE REQUIREMENTS

A. General: Description for each alternate is recognized to be incomplete and abbreviated but implies that each change must be complete for scope of work affected. Refer to applicable sections (Divisions 2 through 16) and to applicable Drawings for specific requirements of each alternate. Coordinate related requirements among sections of Specifications as required. Modify surrounding work as required to integrate with work of each alternate.

1.3 ALTERNATE DESCRIPTIONS

A. Alternate No. 1A to the Base Bid – In lieu of manual hardware, provide and install access control hardware interlocked with class schedule timeclock at both sets of cross corridor doors.

B. Alternate No. 1B to the Base Bid – As an additional feature to Alt #1A, provide and install card reader access control system at both sets of cross corridor doors.

– END OF SECTION 01 23 00 –

SECTION 01 04 50

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 Scope:

1. This Section establishes general requirements pertaining to cutting, fitting and patching of the Work required to:

    1. Make the several parts fit properly;

    2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;

    3. Remove and replace work not conforming to requirements of the Contract Documents; and

    4. Remove and replace defective work.

    5. Remove and patch existing construction for the completion of contract work.

1.2 Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, the General Conditions and Sections in Division 1 of these Specifications.

2. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing, to verify conformance with the Contract Documents.

3. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.3 Quality Assurance:

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. Avoid unnecessary or excessive cutting. Where cutting of a finished surface is required, make cuts neatly along true lines so they will be concealed by finished work and where they will be least conspicuous.

1.4 Submittals:

1. Request for Architect's consent:

    1. Prior to cutting which effects structural safety, submit a written request to the Architect for permission to proceed with cutting. Also obtain written approval from the local building officials, if required by the local building code.

    2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and the required Change Order prior to proceeding.

Notices to the Architect:

3. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.

4. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

PART 2 - PRODUCTS

2.1 For replacement of items removed, use materials complying with pertinent Sections of these Specifications and closely matching the aesthetic value of the existing material.

PART 3 - EXECUTION

3.1 Payment of Costs:

1. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is approved by the Owner. The Contractor shall perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

2. Payment of costs for cutting and patching performed due to ill-timed or defective work will be at no additional cost to the Owner.

3.2 Surface Conditions:

1. Inspection:

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching and backfilling.

2. After uncovering the work, inspect conditions affecting installation of new Work.

2. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.

2. Do not proceed until unsatisfactory conditions are corrected.

3.3 Preparation Prior to Cutting:

1. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.4 Performance:

1. The Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work except as otherwise specifically provided in the Contract Documents. The contractor shall not endanger any Work of any other Contractor except with the written consent of the Architect.

2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

3.5 Cleanup:

1. Remove all debris, rubbish, and materials resulting from cutting and patching operations. Transport materials and legally dispose of off site.

END OF SECTION

SECTION 02 11 00

SELECTIVE DEMOLITION

A. GENERAL

1. DESCRIPTION:

1.1 Requirements of the General Conditions, Supplementary Conditions and Division 1 of these specifications apply to this Section.

1.2. Include all labor, materials, appliances and services necessary to complete all demolition work required by the drawings and/or described in this specification.

1.3 Demolition includes the complete removal of building materials, as indicated on the drawings, and proper disposal, off site, of all demolished materials except where noted. Where noted, some materials may be salvaged for reuse on the project and Owner is entitled to a right of first refusal for all materials identified to be demolished.

1.3.1 See Division 15000 for Mechanical portion, and Division 16000 for Electrical portion of demolition.

2. QUALITY ASSURANCE:

2.1 All work of this Section shall be carefully executed without damage to adjacent construction shown to remain for post construction occupancy.

2.2 All materials scheduled to be relocated or reinstalled shall be removed, cleaned, and stored in such manner that they are not damaged. This includes but is not limited to cabinets and counter tops, interior doors, and interior windows.

2.3 All equipment removed as part of this Contract, and selected by the Owner to be stored for future use by the Owner, shall be delivered to the Owner's storage area.

2.4 Maintain all legal means of egress for adjacent and affected occupied areas during all demolition activities.

3. CONDITION OF STRUCTURES:

3.1 The Owner assumes no responsibility for the actual condition of structures to be demolished.

3.2 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within the structure may occur due to work completed by the construction of earlier phases of this Project, and/or by Owner's removal and salvage operations prior to the start of the demolition work.

3.3 The Owner will be removing furnishings as required to make the work area accessible for operations.

B. EXECUTION

4. GENERAL:

4.1 Perform demolition in a systematic manner, in accordance with approved submittals.

4.2 Where required to install new finishes. Remove existing materials in a manner to accommodate new finishes including removal of all coatings, grouts, adhesives, and other bonding agents.

4.3 Where existing finishes are to remain and abut adjacent new construction, cut and remove existing materials in a neat fashion with straight edges without chipping or cracking.

5. TRAFFIC:

5.1 Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

6. PROTECTION:

6.1 Provide fenced passageways, as required, to ensure the safe passage of persons around the area of demolition. Conduct operations to prevent damage by falling debris or other cause to adjacent buildings, structures, landscaping and other facilities as well as persons.

6.2 Provide dust-tight barriers as required to separate construction/demolition areas from building areas occupied by the Owner during the construction period.

6.3 Cover and protect furnishings that will remain in place during the course of construction.

6.4 Cover and protect floor finishes that will remain in place during the course of construction.

6.5 Provide a weather tight and secure barrier immediately upon removal of items from exterior walls such as louvers, doors, and windows.

7. DAMAGES:

7.1 Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to the Owner.

8. UTILITY SERVICES:

8.1 Maintain existing utilities, indicated to remain, keep in service, and protect against damage during demolition operations.

8.2 Do not interrupt existing utilities serving occupied or used facilities, except when authorized by the Architect. Provide temporary services during interruptions to existing utilities, as acceptable to the Architect.

9. POLLUTION CONTROLS:

9.1 Use water sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air, to the lowest level of air pollution practical for the condition of work. Comply with the governing regulations.

9.2 Clean adjacent structures and improvements of all dust, dirt and debris caused by demolition operations, as directed by the Architect. Return areas to condition existing prior to the start of the work.

10. REMOVAL:

10.1 General: Remove from the site all debris, rubbish and other materials resulting from demolition operations. Storage or sale of materials will not be permitted on the site.

10.2 Burning: Burning of removed materials from demolished structures will not be permitted on the site.

10.3 Removal: Transport all materials, not scheduled to be delivered to the Owner, removed from demolished structures and disposed of off the site.

10.4 Recycling: Ceiling Tile shall be recycled by the original manufacturer (Armstrong) to the greatest extent possible.

- End of Section -

SECTION 05 40 00

COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Non-structural wall and floor framing on interior of building

B. Metal furring strips

1.2 RELATED SECTIONS

A. Section 09260 – Gypsum Board Systems

1.3 QUALITY ASSURANCE:

A. All work shall be in compliance with the Standard Specifications for Structural Steel for Building, and the Code of Standard Practice, adopted by the American Institute of Steel Construction. All metal stud work engaging architectural finishes shall be straight, plumb and true, and shall in no way interfere with the installation of such finishes.

1.4 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

1.5 WEATHER CONDITIONS

A. Comply with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal Framing:

1. Cold Formed (light gauge) Metal Framing (in non-structural locations): Materials shall conform to ASTM A1003, dimensions as indicated on the supplier's approved shop drawings, galvanized per ASTM A1003 with a minimum G40 coating. Wall framing is to be a minimum 20 gage at a maximum spacing of 16" on center. Provide bridging, accessories and fasteners as required by job conditions and the supplier's engineered shop drawings. Gage and strength to be determined by supplier as required for conformance with structural and building code requirements.

2. See structural notes and drawings for additional product requirements.

B. Metal Furring:

1. Roll formed, hat-shaped sections of minimum 20 gauge galvanized steel, size 0.875" x 2.75"

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install metal framing as indicated on the drawings and in compliance with manufacturer's instructions, securely attaching track to structure as indicated on the drawings, and studs to track at 16" on center, unless otherwise noted. Provide deflection track as required.

B. Finished surfaces shall be smooth, uniform and ready to receive architectural finishes and decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

3.2 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

- END OF SECTION 05 40 00 -

SECTION 07 90 00

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparing substrate surfaces.

B. The required applications of sealants include, but are not limited to, the following general locations in new work, or in areas disturbed by the work of this project:

1. Interior:

a. Metal Door and window frames.
b. Joints at all surfaces to receive opaque finish.
c. Joints between steel columns and masonry walls.
d. Joints between all dissimilar materials unless otherwise noted.
e. Other as indicated.

1.2 RELATED SECTIONS

A. Section 08 80 00: Sealants required in conjunction with glazing methods.

1.3 REFERENCES

A. ASTM C790 - Use of Latex Sealing Compounds.

B. ASTM C804 - Use of Solvent-Release Type Sealants.

C. ASTM C834 - Latex Sealing Compounds.

D. ASTM C920 - Elastomeric Joint Sealants.

E. ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers.

F. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations and color availability.

C. Samples: Submit two samples illustrating sealant colors for selection.

D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Specified work shall be installed by skilled tradesmen, experienced in the application of the types of materials.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum five years documented experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation. Apply compound prior to final coat of paint.

1.8 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Deliver all materials to job site in factory sealed and labeled containers; label shall show: Manufacturer, Type, Date of Manufacture, Shelf Life, Curing Time at 70 degrees F, Color and Manufacturer's Instructions.

1.9 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.10 WARRANTY

A. Provide five year warranty under provisions of Division 1.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.0 MANUFACTURERS:

A. Sika Corporation

B. Pecora Corporation

C. Sonneborn – Chemrex

D. Tremco, Inc.

2.1 SEALANTS

A. Back-up Materials: Flexible closed cell, expanded polystyrene or polyethylene round rodding, with diameter 1.333 times width of joint

B. Interior Sealant: Acrylic Emulsion Latex Type C: ASTM C834, single component; color as selected by the Architect

C. Interior Walls/Floors (Ceramic Tile): Pecora Urexpan NR-201, one part, self-leveling, moisture curing polyurethane sealant, designed for horizontal joints, Fed. Spec. TT-5-00230C, Type I, ASTM C920, color as selected by the Architect

D. Primers, Cleaners and Bond Breaker Tape: Provide as recommended by sealant manufacturer's installation instructions for the conditions and locations indicated on the drawings.

E. All sealants and sealant primers must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 percent larger than joint width; manufactured by Dow Chemical, Sonneborn or approved equivalent.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

B. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Division 1.

B. Protect sealants until cured.

- END OF SECTION 07 90 00 -

SECTION 08 12 00

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aluminum doors and frames associated with new aluminum entrances and storefronts.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

C. Related Sections:

1. Section 07 90 00 - Joint Sealants: Caulking between aluminum and adjoining building construction.

2. Section 08 71 00 - Finish Hardware: Finish hardware including cylinders.

1.2 SCOPE

A. Thermal Movement: Fabricate exterior components from manufacturer's stock systems, which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F.

B. Wind Loading: Fabricate exterior components from manufacturer's stock systems which have been tested in accordance with ASTM E-330 to withstand at least the following loadings:

1. Uniform pressure of 20 pounds per square foot inward and 20 pounds per square foot outward.

C. Deviations: Plans, elevations and details show spacing of members as well as profile and similar dimensional requirements of aluminum entrances and storefront work. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in Architect's sole judgment; such deviations do not materially detract from design concept or intended performances.

1.3 STANDARDS

A. Reference: Comply with applicable provisions of AAMA, Metal Curtain Wall, Window, Storefront and Entrance Guide Specifications Manual.

1.4 ENVIRONMENTAL ATTRIBUTES

A. Manufacture and Content:

1. Recycled Content: Provide aluminum products containing 20 percent minimum postconsumer recycled content aluminum material.

1.5 SITE CONDITIONS

A. Field Measurements: Take field measurements; check elevations and connecting work affecting Work of this Section.

B. The finish hardware supplier shall be responsible for furnishing physical hardware to the entrance manufacturer prior to fabrication. The finish hardware supplier shall also be responsible for coordinating hardware delivery requirements with the hardware manufacturer, the general contractor and the entrance manufacturer to insure the building project is not delayed.

1.6 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

1. Include elevations, detail sections of typical composite members, anchorages, reinforcement and expansion provisions.

B. Samples: Submit samples of each type and color of aluminum finish on 12 inch long sections of extrusions or formed shapes and on 6 inch square sheets.

C. Product Data: Submit manufacturer's specifications, standard details and installation recommendations for components of aluminum entrances and storefronts required for project, including data that products have been tested and comply with performance requirements.

D. Accurately document (with supporting information) the use of recycled materials, as required by Section 01350 - Special Procedures (LEED Certification), and post to the Schedule of Materials Costs.

1.7 WARRANTIES, GUARANTEES, TESTING

A. Provide written warranty signed by manufacturer, installer and contractor agreeing to replace aluminum entrances and storefront, which fail in materials or workmanship within two years of acceptance. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware, weather-stripping and other components of the work.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following:

1. Kawneer Company, Inc.

2. Vistawall Architectural Products

3. YKK AP America, Inc.

4. Substitutions: Section 01600 - Product Requirements.

2.2 MATERIALS

A. Aluminum Extrusions: Conform to ASTM B-221, Type 6063-T5 or alloy consistent with desired finish, not less than 0.125 inch thickness for all principal members; other interior members – 0.050 inch thickness; exterior trim members and snap-on covers - 0.050 inch thickness, minimum.

B. Fasteners: Stainless steel or heat-treated aluminum for unexposed fastening of aluminum-to aluminum and aluminum-to-steel; otherwise, exposed fasteners shall be aluminum-finished in the finish matching the aluminum extrusions.

C. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PS 12 compounded for 30-mil thickness per coat.

2.3 STILE AND RAIL-TYPE DOORS

A. Style: Kawneer Wide Stile Model 500 - modified.

B. Construction: Form from extruded sections, assembled with tension rods, top and bottom, or mechanical bolted joints top and bottom and electric arc sigma-welded without creating blemishes on exposed surfaces.

C. Glazing: Doors shall have extruded aluminum snap-in-glass stops with neoprene insets for puttyless glazing.

2.4 FRAMING SYSTEMS

A. Interior Framing (Nonthermal Break):

1. Framing systems shall be Trifab VG 450 as manufactured by Kawneer or equal as approved by the Architect.

2. The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of 1-3/4 inches. Overall depth shall be 4-1/2 inches. Entrance framing members shall be compatible with glass framing in appearance. All single acting entrance frames shall include the positive barrier weathering.

B. Construction:

1. Tubular sections shall be extruded aluminum not less than 1/8-inch thickness, type as indicated on the drawings, designed for 1 inch insulating glass.

2. Door stops shall be applied to tubular sections with concealed fastenings and shall be fitted with neoprene or wool pile insert for weatherproofing and silencing.

3. Door frames shall have butts fully mortised with steel tapping backing plates. No slotting of frames will be permitted.

4. Glass Stops: Sash members shall have permanent clips to hold glass in place before face member is installed.

2.5 ALUMINUM CLOSURES

A. Where closures (break metal) are indicated and required, provide angles and covers formed of 0.125-inch minimum thickness aluminum with matching finish herein specified.

2.6 FINISH

A. All exposed surfaces shall be free of die marks, grinding marks, spots, streaks or other blemishes and shall have the following finishes.

1. Provide Anodized finish system - Clear.

PART 3 EXECUTION

3.1 INSPECTION

A. Condition of Surfaces: Installer shall inspect the substrates to which the work of this section adjoins. No work shall be installed until corrections to substrates have been performed by the trades involved.

3.2 INSTALLATION

A. Framing Members: Install in accordance with manufacturer's approved shop drawing in prepared opening. Members shall be level, square, plumb and at proper elevations and in alignment with other work.

B. Cutting and Fitting: All materials shall be accurately cut and fitted and rigidly secured in place. All cut and machined ends and recesses shall be true, accurate and free of burrs or rough edges.

C. Fastenings: For block walls, use only with toggles with finished heads; fastenings in concrete walls may be made with bolts let into expansion sleeves. Provide 1 inch diameter access hole in aluminum tube for installation of anchoring bolts. Access hole shall be located under doorstop.

D. Use care in subsequent operations to prevent distortion or damage and replace any damaged work with new material.

E. Caulking: Provide clearance between storefront metal and opening substrate for caulking with adjoining building construction. All joints in storefront metal shall be sealed during fabrication.

F. Hardware: Properly install and adjust. Final adjustment shall be made for proper and easy operation of the doors after glazing.

3.3 CLEANING AND PROTECTION

A. Cleaning: After installation, framing members shall be cleaned following procedure recommended by the manufacturer.

B. Dissimilar Materials: In addition to the finish specified, aluminum surfaces that will contact masonry, concrete, wood or steel shall be protected from contact by a coat of bituminous paint to prevent galvanic or corrosive action.

C. Masking: Apply waterproof masking tape to aluminum surfaces remaining exposed on the interior of the building, which may be splattered with mortar, plaster, paint or other disfiguring materials.

D. Protection shall be as recommended by the manufacturer and approved by the Architect. The contractor shall protect storefront from damage during subsequent construction activities. Damaged materials shall be replaced at no additional cost to the Owner.

3.4 OWNER'S INSTRUCTIONS

A. Instructions: Owner's representative shall be given written and verbal instructions as to the procedures required for keeping the work herein specified, maintained, cleaned with appropriate products and adjusted.

B. Tools: Adjusting wrenches and small tools furnished with operating hardware shall be turned over to Owner's representative, properly tagged.

C. Control: The foregoing shall not relieve the contractor of any responsibilities under the guarantee specified hereinbefore.

- END OF SECTION 08 12 00 -

SECTION 08 71 00 - FINISH HARDWARE
(Updated by FCPS Jan. 3, 2013)

PART 1 GENERAL

1.1 DESCRIPTION:

A. Provide all work necessary to complete all finish hardware work as shown on the drawings or inferable therefrom and/or specified herein, In accordance with the requirements of the Contract Documents.

1.2 RELATED SECTIONS:

A. 06200: Finish Carpentry
B. 08110: Steel Doors and Frames
C. 08210: Wood Doors
D. 08410: Aluminum Storefront Systems (this section shall require hardware by section 08710 specified herein).
E. 16700: Electrical Work
F. Overhead Roil-up Doors (7-pin i.e. cylinder)
G. Kitchen Equipment (7-pin i.e. cylinder)
H. Sound Module (9K cylindrical lock)
I. Folding Doors and Partitions (7-pin I.e. cylinder)
J. Security Gate (7-pln cylinder)
K. Walk-in Freezer or Refrigerator (Best 7-pin padlock)
L. Elevators/ADA Chair Lift (7-pln i.e. cylinder)

1.3 DETAILS OF WORK:

A. Refer to drawings, details and schedules for Items requiring finish hardware. It is the intent of this section to include all finish hardware required for the project, except for items, which are specifically noted as being specified in other sections of the specifications.

B. Coordinate the application of hardware items with door and frame details and with methods of fastening as hereinafter specified.

C. Furnish complete templates, schedules and fastening details to door and frame manufacturers and other trades requiring same, to insure doors and frames are properly cut, reinforced and prepared to receive hardware.

D. Single source, furnish only the products of one manufacturer where several manufacturers are specified for one type of hardware.

E. Work includes, but not limited to the following Items:

Hinges
Lock and latch sets

Deadlocks
Exit devices and removable mullions
Door closers
Electro-magnetic door release
Electro-magnetic locks
Power supply Key
switch
Overhead stops and holders
Push and pull plates
Kickandarmorplates
Flushbolts
Floor and/or wall stops
Thresholds
Astragals
Weather-stripping
Gasketing
Door silencers
Key cabinet

F. Work specified to be provided under other sections, includes rough carpentry and Items of finish hardware so specified or provided as part of other sections, Includingthefollowing;

Hardware For:

Windows
Toilet partitions
Operable partitions
Lockers
Cabinets or casework
Roof scuttles
Fence or gates

1.4 REQUIREMENTS OF REGULATORY AGENCIES:

A. Furnish finish hardware in accordance with the requirements, under the published procedures of the following recognized agencies. Wherever possible all hardware and its application are intended to comply with the latest edition of CASO/ANSI A117.1, NFPA 80, NFPA 101 and NFPA 105. It is the intent of this specification that all hardware and Its application shall comply or exceed the standards for labeled openings. In case of conflict between type of hardware specified and type required for fire protection, furnish type required by NFPA and UL.

1.5 QUALITY ASSURANCE:

A. All work performed and all materials furnished shall be in conformity with the

contract requirements.

B. All products listed herein are intended to describe quality, type and function of items listed. Accuracy, and strict compliance with the samples and descriptive literature upon which acceptance is based, shall be the sole responsibility of this supplier.

C. If the Architect finds materials or the finished product in which the materials are used are not in complete conformity with the contract requirements and has resulted in an inferior or unsatisfactory product, the materials shall be removed and replaced by and at the expense of the supplier.

D. The supplier shall be responsible for the provisions, proper coordination and function of the finish hardware required for all openings.

1.6 SUPPLIER QUALIFICATIONS:

A. The hardware supplier shall, in the opinion of the Architect, have sufficient experience and shall have an Architectural Hardware Consultant (AHC) as certified by the Door and Hardware Institute, as a full-time employee of Its organization. The Architectural Hardware Consultant shall be available to attend job meetings as required.

B. After delivery of hardware and prior to its Installation, the hardware consultant shall meet with the Architect and Contractor to compare final samples with actual hardware delivered. To assure acceptability, they shall review catalogs, brochures, templates, Installation Instructions, final hardware schedule, and shall rehearse Installation, procedures and workmanship, with special emphasis on unusual conditions to ensure correct technique of installation, and coordination with other work.

C. The hardware supplier shall maintain a warehouse and office within a fifty (50) mile radius of the job and maintain an inventory and field service staff in order to service the project properly.

1.7 SUBMITTALS:

A. Submit, for review, six (6) complete copies of the finish hardware schedule covering complete Identification of all Items required for the project. Include manufacturer's names and Identification of finishes. Include six (6) complete copies of catalog cuts and/or technical data sheets, identifying each item of hardware and any other data as may be required to show compliance with these specifications. The data on the shop drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Architect to review the information as required. These schedules shall be prepared in conformity with the best practice and standards of the Door and Hardware Institute.

B. Include a separate keying schedule, which shall Include Architect's door numbers, hardware headings, room description numbers and Owner's revised room description numbers as part of the final submittal of the hardware schedule. Schedule format to include an additional column to allow for Owner's revised room description numbers. Upon final approval of the keying requirements by the Architect and Owner, the Owners room numbers shall be listed in the appropriate column and resubmitted to Frederick County Public Schools for final review and approval.

C. The Architect's review of schedules shall neither be construed as a complete check nor shall it relieve the Contractor of responsibility for errors, deviations or omissions from the specified requirements to provide complete hardware for the project.

D. After approval of the hardware schedule the hardware supplier shall furnish to FCPS, four (4) complete sets of manufacturers warranties and product data.

All information will be submitted bound in a hardware schedule cover and shall contain the following information in the order as listed:

- Hardware schedule cover sheet
- Index of manufacturer's
- Manufacturers catalog cuts in the order as listed in the index
- Catalog cuts to be color coded and identified
- Warranties to be listed in order of Index the supplier shall also make available to the owner any service manuals for locksets.

1.8 SAMPLES:

A. In conjunction, and concurrent therewith, with the submission of the finish hardware schedule, submit to the Architect, samples of each typical Item of exposed hardware in specified finish. Submission of samples prior to installation Is mandatory. Architect's review of samples will be for design, pattern, finish and color only. All other requirements are the exclusive responsibility of the Contractor.

B. Samples Required

1. Hinges, each type.
2. Lockset with turn lever, lever cylinder.
3. Panic device, rim type with trim.
4. Pulls complete with mounting accessories.
5. Push plate with fasteners.
6. Surface mounted closer.
7. Overhead holder/stop
8. Floor and/or wall bumpers

C. After final review, deliver samples to job site for comparison with hardware delivered for installation. Unblemished samples may be used as part of the

Work.

1.9 PRODUCT HANDLING ANDSTORAGE:

A. Package and label each Item of hardware separately. Tag each item in accordance with the final hardware schedule. Each package shall contain appropriate fastenings, instructions and installation templates. Protect all items from loss or damage in shipment.

B. The General Contractor shall be responsible for receiving and providing an adequate secured storage area for all hardware. Materials shall be stored so as to assure the preservation of its quality and acceptability for the work. Locate stored material to facilitate its prompt inspection by the Architect.

PART 2 PRODUCTS

2.1 GENERAL:

A. Refer to hardware sets for application of individual hardware items as referenced to each opening or function.

2.2 HARDWARE FINISHES:

A. Produce finishes to exact match with Architect's selected samples. Variances in the color of each finish shall be minimized regardless of whether the base metal is cast, forged or stamped, or when plating is applied over steel, brass or bronze. Comparative finishes shall appear the same when viewed two feet apart and three feet away. The two samples shall be under the same lighting conditions and on the same relative plane. The finish for each item of hardware shall match the finish selected for lock and latch sets. The type of finish for each hardware item Is Indicated in the hardware sets.

2.3 HARDWARE MOUNTING HEIGHTS:

A. The following mounting heights shall apply throughout the work unless otherwise shown or specified and shall comply with the locations for hardware as recommended by the Door and Hardware Institute, other than as specified herewith.

Centerline of strike for levers	40 5/16”
Centerline of exit device touch	40”
pad Centerline of strike for	48"
dead locks Centerline of push	40"
plates Centerline of door pulls	40"

2.4 FASTENERS:

A. Provide concealed fastenings wherever possible. The use of self-tapping or sheet metal screws Is prohibited on all hardware except kickplates and push plates. All exit devices and door closers shall be through-bolt mounted.

1. Concealed Fasteners: Furnish hardware items complete with appropriate type and length of screws or other fastenings suitable to ensure proper applicatlon.

2. Exposed Fasteners: Furnish hardware with countersunk Phillips oval head type screws where concealed fastening is not possible. The finish or color of these screws shall harmonize with the product as to finish and material.

2.5 MATERIALS AND MANUFACTURERS:

A. Acceptable manufacturers for the various items specified are listed below. Products of the underlined manufacturers are ones used in this specification to denote the quality, type, design and function of hardware required. The items of hardware as specified by manufacturer's name and product nomenclature shall comply with any additional features and/or modifications such as base material, finishes, fasteners, etc. The manufacturer and supplier shall be responsible to comply with these requirements as a part of their acceptance. The special features as specified supersede the manufacturer's standard product. Only equivalent products of the listed manufacturers will be accepted. Items listed with NO SUBSTITUTE have been requested by Owner to match existing products, No alternate products will be considered for review, provide products as specified.

Hinges Continuous	Hager-Bommer-Ives
Hinges	Ives-Hager
Locksets/Latchsets	Best-No Substitute
Panic Devices	Von Duprln-No Substitute
Mullions	Von Duprin-No Substitute
Overhead Closers	LCN-No Substitute
Auto Operators	LCN-No Substitute
Overhead Holder	Glynn-Johnson-ABH
Electro-Magnetic Door Release	LCN - Rlxson

Push Plates	Ives - Rockwood - Hager
Kick and Armor Plates	Ives - Rockwood - Hager
Flush Bolts	Ives - Rockwood - Hager
Coordinators	Ives - Rockwood - Hager
Stop and Bumpers	Ives - Rockwood - Hager
Thresholds	National Guard - Pemko - Hager
Weatherstripping	National Guard - Pemko - Hager
Gasketing	National Guard - Pemko - Hager
Astragals	National Guard - Pemko - Hager
Door Silencers	Ives - Rockwood - Hager
Key Cabinet	Telkee
Access Control System	Best-No Substitute
Electric Strikes	*Von* Duprin-No Substitute

2.6 HINGES:

A. All hinges shall be of the type and size as specified and shall conform to the latest edition of ANSI/BHMA A156.1 standards and in compliance with NFPA 80 Table 2.8A. Package all hinges with machine or wood screws as required by door and frame construction.

B. Hinges shall be of flush ball bearing design with flat bottom tips and non-rising pins.

C. All non-ferrous type hinges shall be furnished with stainless steel pins as a standard and all exterior hinges shall be stainless steel with a non-removable pin (NRP) feature per hinge.

D. Where the door Jamb and/or trim projects to such an extent that the width of the hinge leaf specified will not allow the door to properly clear the frame or trim, the supplier shall furnish hinges of sufficient width to clear.

E. Types and Manufacturers:

Hager	Bommer	Ives
881279	885000	SBB1
BB1168	BB5004	SB81HW
881191	885006	5881
881199	885006	5881HW

F. Continuous hinges to be used at all aluminum storefront, cross-corridor, stairwell, cafeteria, gymnasium, locker room and exterior openings, and interior openings where doors are greater than 36" wide.

G. Types and manufacturers:

Ives	Hager
112HD	780-112HD
224HD	780-224HD

2.7 CYLINDRICAL LOCKS AND LATCHES:

A. General: Lockset and latches shall be Best 9K extra-heavy-duty cylindrical series with 7-pin interchangeable core. Locks to have solid shank with no opening for access to keyed lever keeper. Lock chassis must be through-bolted outside of the lock chassis prep to prevent rotation of chassis after installation. Lock manufacturer shall provide three-year warranty, in writing, to the Owner, along with three copies of the lock service manual.

B. Strikes shall be 16 gauge, curved brass, bronze, or stainless steel with a 1" deep box construction, and have sufficient length to clear trim and protect clothing.

C. Tubular Deadbolts shall be Best 83T with 7-pin interchangeable core.

D. Note: Mortise-type locksets will not be acceptable.

E. Types and Manufacturer's

Best-No Substitution

1) Lock series and design: 93K7 X 150 X 626
2) Tubular Deadbolts: 83Tx626
3) Cores/Cylinders: 7-pin to match existing system

2.8 PANIC DEVICES:

A. General: Furnish panic devices of the design, type, function and finish as specified

here within.

1. All devices shall be a push through type touch pad design with return stroke fluid dampener and rubber bottoming dampers. Touch pads are to be stainless steel with no exposed rivets or screws and shall exceed height of mechanism case or rail assembly (T·Shaped) to eliminate pinch points. Plastic touchpads are not acceptable.

2. Latchbolts shall be self-lubricating and have a deadlocking feature.

3. Exit devices shall be listed by UL for accident and hazard. Devices shall conform to ANSI A156.3, Grade 1 and conform to NFPA 80 and NFPA 101.

4. All panic devices shall meet the performance tests found in the Underwriters Laboratories Standard UL305 and bear the UL listing mark for panic hardware or UL 305 and UL 10C for fire exit hardware as appropriate.

5. All exit devices shall be through bolted. All trim shall be through bolted by means of concealed fasteners.

6. A factory representative to insure proper adjustment and operation shall inspect all devices after installation. The representative shall submit a written report to the Architect with copies to the General Contractor and hardware supplier upon completion of his service. This report shall include any Installation problems, noting door numbers and location along with recommendations to correct the problem.

7. All non-fire labeled exit devices shall have cylinder-dogging feature. Dogging mechanism shall be mechanical hook type with no plastic dogging cams.

8. All surface strikes shall be roller type and come complete with a locking plate underneath to prevent movement.

9. End caps shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide flush alignment with device cover plate. When end cap is installed, no raised edges will protrude.

10. Lever trim shaII be heavy-duty type with a breakaway feature to limit damage to the unit from vandalism and fastened by means of concealed welded lugs and through-bolts from Inside. Trim shall be forged brass with a minimum average thickness of .090" and have forged pulls.

11. Outside trim on exterior doors shall be Ives VR910 DT-US32D, unless near a Knox box then it shall be Ives VR910 NL-US32D.

12. Provide rim exit devices at single doors. Provide two rim exit devices with keyed

removable steel mullion at pairs of doors. Concealed or surface vertical rod exit devices or aluminum mulllons will not be permitted except LBL-Less Bottom latch concealed cable device may be used at cross-corridor applications.

13. Provide QEL-Quiet Electric latch Retraction at electrified exit device applications.

B. Types and Manufacturers:

Panic devices

Von Duprin-No Substitution

XP99 Serles (exterior) 99 Series (interior)
9949/9949-F-LBL(cross-corridor)

C. Types and Manufacturers: Mullions

Von Duprin-No Substitution

KR4954 x
154
Stabilizer
s KR9954
x 499F x
154
Stabilizers

2.9 OVERHEAD SURFACE CLOSER

A. Surface Closers

1. Shall conform to ANSI A156.4, Grade 1, NFPA 80, NFPA 101 and Ul10C.

2. Full rack-and-pinion type closer with non-ferrous cover and cast iron body. Double heat-treated shaft, full complement bearings, single piece forged piston, chrome silicon steel spring, non-critical screw valves; back check, sweep and latch.

3. ISO 9000 certified. Units stamped with date of manufacturer code.

4. All non-sized closer to be independent lab tested for 10,000,000 cycles.

5. Locate closers on interior side of exterior doors and on

the non-public side of interior doors, unless otherwise specified. Closers are to be parallel arm mounted.

6. Closers to be non-sized, field adjustable from size 1 to 6.

7. Furnish all non-sized closers with 11/2" diameter piston.

8. All closers shall be mounted with through-bolts.

9. Provide plates, brackets, and special templates when needed for Interface with
particular header, door, and wall conditions and adjacent hardware.

10. Maximum opening force to meet ADA: Exterior doors 8.5 lb.; interior doors 5 lb.; fire doors 15 lb.

11. Spring Cush (SC} Arms at all exterior, Gym, Cafeteria, Stair, and high traffic openings.

12. Closers tested to 100 hours of ASTM 8117 salt spray test, furnish data on request.

13. Spring power adjustment aided by visible size indicator, i.e. "FAST Power Adjust".

14. Closers to have a stable fluid withstanding temperature range of 120 degrees to- 30 degrees hydraulic fluid

15. Install closers at 180-degree templating to provide maximum ADA compllance.

16. Closer products with any type of pressure relief valve system will not be acceptable.

17. Types and Manufacturers:

LCN-Substitution

4040XP pull-side application 4040XP SCNS push-side application

18. Auto operators shall be supplied as specified in hardware set at the end of this section. Furnish all labor, materials, equipment and services necessary for proper installation of the LCN Senior Swing handicap door system, a low energy power operated door system as defined In current ANSI/BHMA A159.19. All auto operators are to be Installed by a certified LCN installation company. Provide Touchless actuators. Coordinate with access control system.

19. Types and Manufacturers:

LCN-No Substitution

Senior Swing Series 9530/9540

2.10 OVERHEAD HOLDERS AND STOPS:

A. General: Furnish surface-mounted overhead holder/stop of the type, design and function as specified here within.

1. All holders shall be non-handed and furnished complete with proper fasteners.

2. All holder arms and channels shall be made of extruded bronze or stainless steel.

3. Shock absorber to be a shock absorbing coil steel spring with a rubber insert.

4. Furnish sex bolts on all wood doors.

B. All products herewith shall comply with the standards of ANSI/BHMA A.156.8.

C. Types and Manufacturers:

Glynn-Johnson

450$	4420
450F	4430
450H	4410
90H	9000H

2.11 ELECTRO-MAGNETIC DOOR RELEASE:

A. General: Furnish electromagnets hold open devices designed specifically to hold fire and smoke doors open until released under activation of the fire alarm system or loss of power.

1. Faceplates shall be stainless steel for flush or surface mounting and shall fit into standard single gang electrical boxes.

2. Assembly shall consist of an armature contact plate with adjustable pivot mounting.

3. All units to be equipped with easy wire quick insert connectors.

4. Holding force to be 25 pounds, voltage to be 24VDC, unless otherwise approved by the Architect.

5. Types and Manufacturers:

LCN	Rixon
SEM7840	FM998

NOTE: ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING, JUNCTION BOXES, CONDUIT, RECIFIERS, TRANSFORMERS ETC., INCLUDING ALL CONNECTIONS AS REQUIRED TO PROVIDE A COMPLETE OPERATIONAL SYSTEM UNDER DIVISION 16/DIVISION 28.

2.12 PUSH/PULL PLATES:

A. General: Push plates and pull plates shall be provided as scheduled.

B. All plates shall be drilled and countersunk approximately 6" on centers. All plates shall be furnished with stainless steel Phillip's head screws with undercut heads to Insure a tight bond on any type of door. All plates shall be packaged in individual envelopes, clearly marked and sized. All material shall be properly packaged to protect the finish.

C. All products shall comply with ANSI/BHMA standards A156.6 and A156.18.

D. All push and pull plates shall have radius corners.

E. All push plates shall be a minimum thickness .125.

F. All pull plates shall be a minimum thickness .050.

G. Types and Manufacturers:

Ives	Rockwood	Hager
82004"x16"	73 RC, 4x16	90R,4 X16
8302 4"x16"	107 X 70RC, 4X16	43G, 4x16

2.13 KICK AND ARMOR PLATES:

A. General: All kick plates and armor plates shall be .050 inch minimum thickness stainless steel, US32D. Plates to be beveled three edges (B3E), drilled and countersunk with stainless steel screws 5/8" minimum with matching finish.

B. All plates shall be in compliance with ANSI/BHMA standards A156.6 and A156.18.

C. Types and Manufacturers:

Ives	Rockwood	Hager
8400 Serles	K1050 Serles	193S

2.14 MANUAL FLUSH BOLTS AND COORDINATORS:

A. General: All flush bolts are to be manually operated and furnished for pairs of doors as specified. Furnish minimum length of 12" for all rods, except where any door is higher than 7'-0", furnish the top bolt in a length sufficient to locate the flush bolt operator no more than 6'-0" above the finished floor. Comply with ANSI A115.4, door and frame preparation and ANSI/BHMA A156.16. Furnish standard strikes with wrought boxes for top bolts. Furnish dustproof strikes for bottom bolts. Coordinators are to be used only on hollow metal doors.

B. Types and Manufacturers:

Ives	Rockwood	Hager
FB458	555	282D
FB41P/42	1942	291D
CORxFLxMB1/2	1600xFillerxMtg. Brkt.	297Dx297Fx297M/N
FB31P/32	1842	292D
FB358	557	283D

2.15 DUSTPROOF STRIKES:

A. Dustproof Floor Strikes: For 5/8" round or 1/2" square bolts.

1. Ives: DP1/2
2. Rockwood: 570
3. Hager: 280X

2.16 FLOOR AND WALL STOPS:

A. General: Furnish floor and/or wall stops as indicated, unless otherwise specified.

Ives	Rockwood	Hager
WS406CCV	410	236W
FS436	440	241F
FS441	471	257F
FS495	494	326W
FS496	491	326F

2.17 THRESHOLDS:

A. General: Furnish thresholds of the type, finish and material as specified.

B. Fasteners shall be of stainless steel or non-ferrous material with a finish compatible with the threshold. The length of the screw used should be the proper length to allow for a minimum of 3/4" thread engagement in the floor or anchoring device used.

C. All material shall be Incompliance with ANSI/BHMA standards A156.21.

D. All aluminum extrusions are to be of alloy 6063 hardness T-5.

E. Types and Manufacturers:

National Guard	Pemko	
513	1665A	413S
896S	2005	520S
950S	2001	477S

2.18 WEATHER STRIPPING/GASKETING:

A. General: Furnish all weather stripping, gasketing, door bottoms and astragals as specified.

B. Wherever the specified materials are used in conjunction with a fire rated opening, products shall have been tested in accordance with the Underwriters Laboratories, UL10C and shall meet the requirements of positive pressure USC 7- 2.

C. All gasketing material shall be silicone and in compliance with ANSI/BHMA standard A156.22 for door gasketing systems.

D. Types and Manufacturers:

	National Guard	Pemko	Hager
Gasketing	107S	379S	864S
Gasketing	155S	303AS	891S
Gasketing	9090	PK55	
Door Sweep	C627A	3452CP	770SB
Door Sweep	C607A	18062CP	802S
Astragal	158SA	355 CS	859S
Astragal	109SA	375CR	874S
Astragal	9115A		

2.19 DOOR SILENCERS:

A. Furnish for all hollow metal frames, three door silencers for each single door and two each for each pair of doors as manufactured by one of the following manufacturers.

1. Ives:
2. Rockwood:
3. Hager:

SR64 608
307D

2.20 KEY CONTROL SYSTEM:

A. General: Furnish a complete key system of the type specified.

B. Provide key cabinet made of cold rolled, minimum 18-gauge furniture steel electro-welded. Doors shall have continuous brass pin piano type hinge and shall be equipped with chrome-plated locking handles, hook cam and two paracentric keys. All locks shall be nickel plated with solid brass pin tumbler cylinder keyed as directed. Key cabinet and key control system shall accommodate all keys for this project plus fifty percent expansion.

1. Key tags shall consist of two sets: Permanent self-locking and loan key snap hook type with tag colors as follows: Red fiber markers of the permanent

self-locking type approximately 1·1/4" inch in diameter on, which shall be engraved the legend, "File Key Must Not Be Loaned."

2. Also furnish for each hook a white cloverleaf key marker with snap hooks on which shall be engraved "Loan Key."

C. The hardware supplier shall attach a key tag to each change key and shall mark thereon the respective architectural key symbol and key bitting number. Each group of keys shall be contained in a key gathering envelope, which shall Include the architectural key symbol, key bitting number and architectural room description number.

The hardware supplier shall be responsible for properly identifying and tagging all change keys, setting up the key cabinet and key Index system.

The General Contractor shall be responsible for verifying that all locksets are Installed In their proper location and that the key changes operate the correct locks.

1. Key Index System Shall Include:

a. Hook number
b. Architectural key symbol
c. Archltectural door number
d. Owner's revised room number
e. Key bitting number

D. The hardware supplier shall Include In their scope of work all labor necessary to completely layout the key index system and install all keys, properly Identified In the key cabinet. The permanent keys and key cabinet shall be delivered directly to the Owner.

E. The key cabinet shall be a three-way cross Index system and shall include a hardbound copy and disk, including master key listing the keys alphabetically, the hooks numerically and the key bitting changes numerically. Attach the keys to the two sets of numbered tags supplied with the cabinet, permanent tag and the loan key tags. The supplier shall Instruct the Owner in use of the system. The General Contractor shall install the cabinet in a location selected by the Owner.

F. Type and Manufacturers:

1. Telkee Aristocrat AWC-450-S System

Size of system is minimum requirement, appropriate size to be furnished dependent on project.

2.21 KEYS AND KEYING:

A. Provide Best brass construction cores and keys during the construction period. Plastic construction cores will not be permitted. Construction cores shall not be part of the Owner's permanent keying system or furnished on the same keyway or key section as the owner's permanent keying system.

B. Permanent Best cores and keys shall be prepared according to the approved keying schedule and shall be furnished to the Owner by the local Best factory representative prior to occupancy.

C. All cylinders and cores shall be Best 7-pin, interchangeable core. Furnish Best "Premium" cores at all exterior keyed openings. Best cores shall be keyed by the factory to match the existing Frederick County Public School key system.

D. Permanent Best keys and cores shall be 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 "Duplication Prohibited."

E. Grand Master keys, Master keys and other Security keys shall be transmitted to the Owner by Registered Mail, return receipt requested.

F. Furnish keys in the following quantities:
1. 4 each Grand Master keys
2. 4 each Master keys per set
3. 4 each Change keys each keyed core
4. 9 each Construction Master keys
5. 1 each Construction Control key

G. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Contractor's Hardware Supplier. All Construction cores and keys remain the property of the Contractor's Hardware Supplier.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL:

A. The Contractor shall receive all hardware for doors as shown and scheduled and as in accordance with the approved hardware schedule.

B. Provide an adequate and secured storage area for all hardware; refer to paragraph 1.09.

C. Install all hardware in strict accordance with the manufacturer's templates and Installation procedures and workmanship, refer to paragraph 1.03.

D. The Contractor shall turn over to the Owner any tools supplied with the hardware to adjust or maintain the hardware.

E. In conjunction with the hardware supplier, the Contractor shall adjust and check the installation of hardware prior to acceptance by the Owner and/or Architect.

F. The Contractor shall obtain a copy of ANSI/DHI A115.IG-1994. "Installation Guide for Doors and Hardware." It is the intent of this document to be used

as a reference guide in the proper handling, storage and installation of finish hardware and doors and frames. This document can be obtained through the Door and Hardware Institute, Chantilly, VA.

G. All hardware shall be inspected by the factory representative prior to final acceptance by FCPS to ensure proper installation and adjustment. The representative shall submit a written report to the Architect with copies to the Contractor and hardware supplier upon completion of his service. This report shall Include any installation problems, noting door numbers and location along with recommendations to correct the problem.

H. The Contractor and construction manager shall coordinate a pre-installation meeting with the hardware installers, the hardware supplier, and manufacturers' representative to review products specified and their proper Installation.

3.2 Electronic Access Control System Requirements:

A. Summary of Work: The hardware supplier shall obtain the services of Best Access Systems to furnish and install the hardwire Electronic Access Control System (EAC) under this Section. The EAC system shall be tied into Frederick County Public Schools (FCPS) existing BASIS Access Control Software System. Through the hardware supplier, BEST shall furnish all labor, material and services necessary to install a complete EAC system. Note, regardless of door and frame material, the EAC system shall be included in the hardware supplier scope of work. No deviations will be allowed. Card Readers shall be provided at the doors indicated in the attached hardware schedule.

B. Access Control System Equipment Requirements:

Furnish the following equipment:

1. One (1) Intelligent System Controller/ Network Device/ Communication Cable & Enclosure # BAS-2220 x LS-MSS100-1 x HOC-ETHLAN.
2. Minimum of five (5) Magnetic Card Access Reader BAS-2005W (Black) per school.
3. Minimum of three (3) Dual Reader Interface Module BAS-1320 per school.
4. Minimum of one (1) "UL" listed Power Supplies & Enclosure BAS·AL600ULM x ABT-12 per School.
5. Wiring requirements are 18 gauge, 4 paired, (8 wire) twisted, shield, plenum rated "UL" listed. Note: Wire shall be provided and installed by BEST. The Electrical Contractor shall provide conduct as required, under Division 16.

Note equipment shall be configured and engineered to suit overall system requirements above quantities may vary.

C. Hardware Requirements and Door Application:

At exterior (double or single) doors requiring exit devices, furnish fall secure quiet electric latch retraction exit devices (QEL), power supply, and power transfer hinge (EPT-10). At non-egress (single) exterior door furnish cylindrical lockset with fall secure electric strike (6211). All electrified hardware shall be interfaced with the EAC system, and be connected to the emergency generator. Regardless of door and frame material, electrified hardware shall be Included in the hardware supplier scope of work.

Example 1 Double doors to receive card reader will require:

2	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	MULLIION	KR4954 X 154 STABILIZERS
1	EA	PANIC HARDWARE	CD XP99EO
1	EA	PANIC HARDWARE	SD QELXP99EO
1	EA	RIM CYLINDER	1E72
3	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910 DT
1	EA	DOOR PULL	VR910 NL
2	EA	SURFACE CLOSER	4040XP SCNS
1	EA	CARD READER	BAS-2005 W
2	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS 904-4RL-BB-KLC

Example 2 Single door to receive card reader will require:

1	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	PANIC HARDWARE	SD QELXP99 EO
1	EA	RIM CYLINDER	1E72
1	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910NL
1	EA	SURFACE CLOSER	4040XPSCNS
1	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS904-4RL-BB-KLC
1	EA	CARD READER	BAS 2005W

D. Power and Network Requirements:

As necessary, the Electrical Contractor responsible for Division 16 shall provide switched 120V power, conduit and junction boxes at each card reader location and In the Server/Telecom room for EAC equipment. General Contractor shall be responsible for providing a network drop at the Server/Telecom room. FCPS shall provide a dedicated IP address to

BEST before EAC system start up. EAC system consisting of card reader system and electrified hardware controlled by card access shall be tied into the emergency generator back up system. In addition, provide battery back up at Main Entrance door. Prior to installation, coordinate final location of card readers and access control equipment with FCPS.

E. Owner Provided:

Magnetic swipe cards shall be furnished and programmed by FCPS.

F. Submittals:

In accordance with Division 1, submit shop drawings and catalog cuts for approval.

Hardware Set Schedule:

Set #1 BASE BID – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum entrance doors in storefront framing. Each to have:

BASE BID Function – Manual egress hardware with rim (egress only) function and keyed access. Electronic access control not included.

2	Continuous Hinges – Hagar Roton 780-224HD	Clear
2	Rim Exit Device – Von Duprin CDSI-99EO	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
3	Mortise Cylinders – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	

Set #1A ADD ALT #1A – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to have:

ADD ALT #1A Function – Access controlled egress hardware with rim (egress only) function and keyed access. Electric latch retraction interlocked with existing timeclock on class change schedule.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99E With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
1	Mortise Cylinder – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #1B ADD ALT #1B – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to have:

ADD ALT #1B Function – Access controlled egress hardware with rim (egress only) function and keyed access. Electric rod retraction interlocked with existing timeclock on class change schedule AND activated by card reader.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99EO With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
1	Mortise Cylinder – Best	626

2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #2 – Door 2/102 consisting of single 3'-0"x7'-0" aluminum entrance door in storefront framing.

Function – Access controlled egress hardware with electric strike activated by remote desk station and card reader.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Storeroom Lockset – Best 9K37-15-D	626
1	Electric Strike – Von Duprin 6400	US32D
1	Surface Closer – LCN 4040XP	689
1	Mounting Plate	689
1	Floor Stop	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Remote desk station	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #3 – Doors 1/102 and 3/102 consisting of single 3'-0"x7'-0" aluminum entrance door in storefront framing.

Function – Manual egress hardware and lockset. Electronic access control not included.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Cylindrical Lockset – Best 9K37-15-AB	626
1	Surface Closer - LCN 4040XP	689
1	Mounting Plate	689
1	Floor Stop	

Set #4 – Door 1/100 consisting of single existing hollow metal entrance door in existing hollow metal framing.

Function – Existing egress hardware is access controlled with electric strike activated by remote desk station and card reader. RETROFIT with new ADA compliant egress hardware

2	Rim Egress Device – Von Duprin 99 Series CDSI-99-EO	US32D
1	Rim Cylinder - Best	626
2	Mortise Cylinders – Best	626
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes glass and glazing.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

1.2 STANDARDS

A. As required by Safety Glazing Materials regulations and agencies having jurisdiction, provide safety glass manufactured, tested, permanently labeled and installed per these requirements.

1.3 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

B. Copies of the shop drawings, after being certified by the contractor and approved by the Architect, shall be requested by the glazier through channels for the purpose of ordering the glass and expediting its delivery.

C. Samples: Submit, when notified for the Architect's inspection and approval, samples of the types of glass specified. Sample shall be at least 4 inches wide by 9 inches long in required thickness.

1.4 WARRANTIES, GUARANTEES, TESTING

A. Warranty: All insulating glass shall be a banded type and carry a 10-year warranty by the manufacturer that under normal conditions, material obstruction of vision resulting from film formation or dust collection between the interior glass surfaces of the double-insulating glass will not occur.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Glass: Glass shall bear the manufacturer's original label for each piece manufactured by the American-Saint Gobain, Libbey-Owens Ford Glass Company, PPG, Guardian or equal as approved by the Architect.

B. Clear glass shall be transparent flat glass that meets the requirements and tolerances of ASTM C-1036.

C. Glass products shall be tempered for use in doors, entranceways, or other high traffic density areas or in hazardous locations as defined in the U.S. Consumer Product Safety Commission Standard 16 CFR 1201 C1 and C11, or for fixed glazed panels as defined in state glazing laws or building codes.

D. Glazing Compound: Glazing compound shall be the product of Pecora, Tremco, or equal as approved by the Architect, in color matching frames as closely as possible.

2.2 SIZES

A. Glass shall conform to manufacturer's standards for maximum size for each type of glass. All tempered glass and double-insulating glass panels shall be ordered from exact sizes given on shop drawings or from field measurements. Lights that are narrower than they are high shall be cut to order to obtain the best viewing.

2.3 GLASS TYPES

A. Safety Glass (Type G-3) (interior glazing): Clear tempered, 1/4” thick, ANSI Z97.1, Federal Standard 16 CFR 1201 Category I and Category II, with label clearly visible after glazing. This type includes laminated glass as required by the standards referenced above and IBC 2012 Chapter 24 Section 6.

B. Sealant: Elastic non-hardening glazing sealant, recommended by glazing manufacturer.

C. Setting Blocks: Neoprene, hardness: 70 to 80 Shore A Durometer, generally 1/8” wider than materials to be glazed and minimum 4” long, 1/8” thick.

PART 3 EXECUTION

3.1 INSTALLATION

A. Glazing Standards: Applicable requirements of the Glazing Manual of Flat Glass Marketing Association (FGMA), 3310 Harrison, Topeka, Kansas, 66611 latest edition are hereby made a part of these specifications.

B. Glazing shall not be done when the temperatures are below 40 degrees Fahrenheit. When circumstances require the glazing below 45 degrees Fahrenheit, steps shall be taken to assure clean, dry and frost-free surfaces as approved by the Architect.

C. Spacers and Shims: All glass to be set with 3/32 inch x 1/4 inch x 3 inch spacers, positioned on 24 inch centers on fixed and removable stops made of 40-70 shore hardness rubber or neoprene setting blocks, 1/4 inch x 1 inch x 4 inches long or 1/4 inch x 5/8 inch x 4 inches long, as required by FGJA Standards for installing glass at quarter points.

D. Channel Glazing: All glass to be set with a minimum of 1/8 inch spacers on both sides of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with one part acrylic sealant at heel finished with architectural glazing compound or vision strip.

E. Face Glazing: All glass to be set with a minimum of 1/8 inch spacers on rabbet side of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with architectural glazing compound.

F. Neoprene Beads: Glass in aluminum door frames and screens held by neoprene-extruded beads, snap-in type shall be inserted into stops with slight buttering at corners with channel glazing compound. Install glass per manufacturer's instructions.

G. Lights in Borrowed Lights: Glaze with metal stops as detailed. Face glaze as specified above.

3.2 CLEANING AND REPLACEMENT

A. This contractor shall properly protect all glass installed by him from injury or breakage during construction of the building. The contractor shall assume all responsibility for breakage by whomsoever caused and shall replace all cracked, broken, scratched or otherwise defective glass when directed to do so by the Architect.

B. Wash, rinse and dry glass at frequent intervals during construction in accordance with manufacturers' recommendations.

- END OF SECTION 08 80 00 -

SECTION 09 25 00
GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Requirements of the General Conditions and Supplementary Conditions apply to this Section.

B. Include all labor, materials, appliances and services necessary to complete all gypsum wallboard and related work required by the drawings and/or described in this specification.

C. Work of this Section includes repairs to existing gypsum board, located within the existing building, and preparing existing gypsum board to receive new finishes.

1.02 QUALITY ASSURANCE:

A. All work shall be in compliance with the Drywall Construction Handbook, published by United States Gypsum Company.

10.3 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

1.04 WEATHER CONDITIONS:

A. Comply with manufacturer's recommendations.

1.05 WORK BY OTHER SECTIONS:

A. Division 5 - Lightgage Metal Framing

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Gypsum Wallboard:

1. Regular: 5/8" x 4' x 8' (minimum), with tapered edges, ASTM C-36, Underwriters Laboratories Approved

2. Type X (special fire resistant): 0.625" x 4' x 8' (minimum), with tapered edges, Underwriters Laboratories Approved

B. Fasteners: 1-1/2" GWB-54 annular ringed nails or 1-1/4" drywall screws, Type W with phillips head.

C. Drywall accessories include corner and casing beads; shall be standard galvanized recessed types requiring finishing with joint treatment compound.

D. Joint Treatment System: Includes perforated tape, joint compound and topping compound.

E. Expansion Joints: USG Control Joint #093

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install gypsum wallboard and accessories in locations and positions indicated on the drawings, complying with manufacturer's installation instructions.

B. Cut wallboard by scoring and breaking, cut to fit tightly to other sheets of wallboard and around penetrations and protrusions. Joints shall fall on the centers of supporting members. Install with nails at 8" centers or screws at 16" centers.

C. Finish wallboard using 3 coats of compound 24 hours apart. Finish all dimples from fasteners and joints between sheets of wallboard. Apply dampened tape with the first coat and feather compound edges to provide a smooth and uniform surface. Sand rough areas but do not excessively roughen the wallboard paper.

D. Build fire rated assemblies in accordance with specific fire resistance classifications of the Underwriters' Laboratories.

E. Provide expansion joints as indicated on the drawings. Unless otherwise noted, provide joints to align with expansion control joints in masonry walls, concrete floor, and other building structural elements. Joints shall extend from floor to metal deck/top of gypsum wallboard above, and shall be installed aligned on both sides of all interior walls.

F. Finished surfaces shall be smooth, uniform and ready to receive decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

G. Level of Finish: Level 4 in accordance with the United States Gypsum Construction Handbook.

3.02 JOINT TREATMENT

A. Tape, fill and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

3.03 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.04 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

END OF SECTION

SECTION 09306

FLOOR TILE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Ceramic floor finish using the thinset application method to patch and repair existing materials.

1.2 RELATED SECTIONS

A. Section 07900 - Joint Sealers: Mildew resistant sealant.

1.3 REFERENCES

A. ANSI A108.4 - Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive.

B. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.

C. ANSI A108.10 - Installation of Grout in Tilework.

D. ANSI A118.1 - Dry-Set Portland Cement Mortar.

E. ANSI A118.4 - Latex Portland Cement Mortar.

F. ANSI A118.6 - Ceramic Tile Grouts.

G. ANSI A137.1 - Standard Specifications for Ceramic Tile.

H. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.

C. Product Data: Provide instructions for using adhesives and grouts.

D. Samples: Submit two (2) samples (or more if required to show color variations in tile) of all tiles and grouts for color selection by Architect.

E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

F. Submit letter of acceptance of grout and adhesive from tile manufacturer.

1.5 MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with all applicable portions of ANSI Standard Specifications for tile work.

B. Conform to TCA Handbook.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing the work of this section with minimum five years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in an unventilated environment.

B. Maintain a minimum of 50 degrees F during and for 3 days after installing tile and grout.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide 8 sq ft of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.1 TILE MANUFACTURERS

Where attic stock for repairs is not available, provide new material to match existing size, color, and texture.
(Note: Color to match to be approved by Owner prior to installation)

A. Dal-Tile Corporation
B. American Olean
C. Royal Mosa

2.2 TILE MATERIALS

A. To match existing.

2.4 BASE MATERIALS

A. To match existing.

2.5 SETTING MATERIALS

A. Approved by Tile Manufacturer

B. Materials: Floor Tile (all new CT to be installed thinset):
1. Dry Set Mortar: ANSI A108.5 and A118.1

2. Water: Potable
3. Grout: Dry Set Grout w/latex additive: ANSI 118.6 (Color as selected by Architect)

2.6 ACCESSORIES

A. None.

2.7 GROUT MIX

A. Mix and proportion pre-mix grout materials in accordance with manufacturer's instructions and TCA Handbook.

B. Apply grout sealer to all grout joints per grout manufacturer's guidelines.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect all surfaces upon which tile is to be applied for smoothness and cleanliness. Unsatisfactory variations (in excess of 1/4" in 8'-0" in thin set applications) shall be corrected before proceeding with the work of this Section. Surfaces shall be free of coatings, oil, wax and shall be roughened to permit scratch coat to bond. Ensure that all work by other trades is installed, imbedded and tested before proceeding with the work of this Section.

3.2 PREPARATION

A. Protect surrounding work from damage or disfiguration.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Apply conditioner to substrate surfaces in accordance with adhesive manufacturer's instructions.

3.3 INSTALLATION - THINSET METHOD

A. Install adhesive tile, thresholds and grout in accordance with manufacturer's instructions and TCA Handbook. Installation shall be per TCA F113 for all thinset tile floors over concrete.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Place thresholds at exposed tile edges. Install thresholds using same method as floor tile.

D. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly. Align floor, base and wall joints.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

F. Sound tile after setting. Replace hollow sounding units.

G. Allow tile to set for a minimum of 48 hours prior to grouting.

H. Apply grout, strike and tool joints and cure in accordance with grout manufacturer's instructions. Damp cure as specified in TCA Detail requirements.

I. Lay out tile work accurately, symmetrically and perpendicular and parallel to walls and floors in positions and locations indicated on the drawings. Lay tiles so that generally no

tiles less than half sizes will occur. Fit tile closely around the work of other trades, slope floors uniformly to drains.

J. Lay out tile work so that joints are centered over control/expansion joints in substrates. Space tile accordingly, so that no tile will be cut between these joints. Unless otherwise noted provide expansion joints in tile, in accordance with TCA details, at each column line, and/or at 16' on center in each dimension.

3.4 CLEANING

A. Clean tile and grout surfaces, acid cleaners not permitted. Wash tile with clear water after the grout has stiffened. Clean with damp cloths and wet vac to remove all grout residue.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished Work with non-staining building paper.

B. Do not permit traffic over finished floor surface for 4 days after installation.

- END OF SECTION 09306 -

SECTION 09 51 10

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system and perimeter trim as indicated on the drawings and as required to patch and repair existing materials.

B. Mineral fiber acoustical ceiling tile units.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. ASTM E1264 - Classification of Acoustical Ceiling Products.

C. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

1.4 SYSTEM DESCRIPTION

A. Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on metal grid system components and acoustical units.

C. Product Data: Submit data on acoustical wall treatment.

D. Samples: Submit two samples 6 x 6 inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner and edge trim.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.7 QUALIFICATIONS

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C) and maximum humidity of 40 percent prior to, during and after acoustical unit installation.

1.9 SEQUENCING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustical units after interior wet work is dry.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide 2 percent of total acoustical unit area of extra panels to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong World Industries, Prelude System

B. Chicago Metallic, 200 Series

C. Equal product by CertainTeed

2.2 SUSPENSION SYSTEM MATERIALS

A. Non-fire Rated Grid: ASTM C635, intermediate duty, exposed T components die cut and interlocking.

B. Grid Materials: Commercial quality cold rolled steel with galvanized coating, minimum 25% recycled content.

C. Exposed Grid Surface Width: 15/16 inch.

D. Grid Finish: Baked Polyester Paint, color to be White.

E. Accessories: Stabilizer bars, clips, splices, edge moldings, hold down clips and as required for suspended grid system.

F. Support Channels and Hangers: Primed steel; size and type to suit application and ceiling system flatness requirement specified.

2.3 MANUFACTURERS - ACOUSTICAL UNITS

A. Armstrong World Industries (used as the standard of quality, listed model numbers)

B. Equal product by Chicago Metallic

C. Equal product by CertainTeed

2.4 ACOUSTICAL UNIT MATERIALS

A. Acoustical Ceiling Panels (Size See finish schedule for location of each type of tile):

1. ACT -1 to be 24 X 48 inches, Armstrong Fine Fissured, (to match existing ACT in lobby and corridor),

2. Thickness: 3/4 inches

3. Composition: Wet formed mineral fiber, minimum 35% recycled content, no added formaldehyde.

4. NRC Range: .70

5. CAC Range: 35

6. Fire Hazard Classification: Class A, Flame Spread less than 25

7. Edge: Square

8. Surface Color: White

9. Surface Finish: Factory applied

2.5 ACCESSORIES

A. Touch-up Paint: Type and color to match acoustical tile and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that layout of hangers will not interfere with other work. Confirm starting lines for layout with Architect.

3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C-636 and manufacturer's instructions and as supplemented in this section.

B. Intermediate - duty grid: Comply with ASTM C-636, suspension requirements of ASTM C-635, intermediate-duty systems, and manufacturer's installation instructions.

C. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

D. Locate system on room axis according to reflected plan.

E. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

K. Form expansion joints as detailed. Maintain visual closure.

3.3 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Install units after above ceiling work is complete.

D. Install acoustical units level, in uniform plane, and free from twist, warp and dents.

E. Cut panels to fit irregular grid and perimeter edge trim.

F. Where bullnose concrete block corners occur, provide preformed closers to match edge molding.

G. Install hold-down clips to retain panels tight to grid system within 20 ft of all exterior doors.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 STOCK MATERIALS

A. At the end of the project, provide 2% of the acoustical tile for each size, type and pattern installed. Extra stock to be turned over to the owner.

- END OF SECTION 09511 -

SECTION 09 65 19

RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient tile flooring, including vinyl composition tile. Installation requires matching existing tile in multiple locations.

B. Rubber base.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. ASTM F1066 - Vinyl Composition Floor Tile.

C. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Samples: Submit two sets of samples illustrating color and pattern for vinyl tile, rubber tile, rubber base and reducing/trim strips for color selection by the Architect.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/smoke rating requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.8 MAINTENANCE DATA

A. Submit under provisions of applicable Division 1 sections.

B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.9 EXTRA MATERIALS

A. Furnish under provisions of Section 01700.

B. Provide one box of each type of tile per 50 boxes of tile per color/pattern used, 10 lineal feet of base for every 500 linear feet installed, and four external base corners.

1.10WARRANTY

A. Provide manufacturer's standard 5-year warranty on all tile flooring products.

PART 2 PRODUCTS

2.1 MATERIALS – VINYL TILE FLOORING

A. Vinyl Composition Tile: ASTM F1066 and SS-T-312 BC, Type IV

1. Size: 12 x 12 inch – to match existing
2. Thickness: 1/8 inch – to match existing
3. Design: marbleized – to match existing
4. Manufacturers:
   a. Armstrong, Style - Standard Excelon Imperial Textured
   b. Azrock, Style - Custom Cortina
   c. Tarkett, Style - Expressions
   d. Mannington - L
5. Pattern: Varies – to match existing
6. Color: Varies – to match existing

2.2 MATERIALS – RUBBER BASE

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite

2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.3 MATERIALS – SHEET VINYL

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite
2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.5 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Edge (transition) Strips: Flooring material manufactured by Mercer, Johnsonite, or equal, color to match vinyl base color adjacent to strip.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify concrete floors are dry to a maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization or dusting.

B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

3.3 INSTALLATION - TILE FLOORING

A. Install in accordance with manufacturer's instructions. See drawings for patterns.

B. Mix tile from container to ensure shade variations are consistent when tile is placed.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

F. Install tile to turn block pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

H. Install resilient edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

J. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Vinyl Composition and Rubber Flooring

1. Stripping

a. Strip floor using a slow speed floor machine and green stripping pad. Use Freedom, Bravo or Step-Off stripping products only.

b. Rinse floor at least twice with clean water and let dry. Use wet-vac to remove stripping solution and water.

2. Apply Finish

a. Apply five coats (2,000 to 2.500 SF/gal) of Carefree with clean, pre-rinsed rayon mop, allowing 1 hour minimum dry time between coats. Allow final coat to dry 24 hours before allowing traffic on finished floor.

3.6 PROTECTION OF FINISHED WORK

A. Protect finished Work. Entire floor to be protected with red rosin paper, taped.

B. Prohibit traffic on floor finish for 48 hours after installation.

- END OF SECTION 09 65 19 -

SECTION 09 90 00

COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes:

1. Paint or natural finish all interior surfaces not specifically excluded. Includes:

a. All areas indicated on the drawings and included in the schedule noted to be painted.
b. Areas of patch and repair of existing painted components.

B. Exclusions: In addition to material obviously not requiring paint such as stainless steel, plastic laminate, glass, flooring, tile, etc. Do not paint or finish:

1. Surfaces indicated by finish schedule to remain unfinished.

2. Factory finished surfaces indicated to be factory finished.

a. Aluminum with anodized or baked-on finish.
b. Finish hardware, except hardware with USP finish.
c. Electrical devices, fixtures, and trim.

3. Equipment such as mechanical, and electrical equipment located inside equipment rooms.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.

B. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

C. OTC-Regulation No.41

D. SSPC-SP 1 - Solvent Cleaning

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Indoor Air Quality: Provide products which will not adversely affect indoor air quality through emission of toxic gasses or vapors. Do not use materials with residual of formaldehyde, epoxy resin, or urea-based materials.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on all finishing products and special coatings.

C. Samples: Submit two samples, 6 x 6 inch in size illustrating selected colors and textures for each color selected. Wood stains shall be applied to actual piece of trim material.

D. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention.

E. Verify in writing that the products specified will be used as directed or submit for approval a list of comparable materials of another listed approved manufacturer, including full identification of all products by name, color and catalogue number adjacent to those specified, with a statement of equality by the proposed manufacturer.

F. Submit Manufacturer's certification (MSDS Sheet) for each paint and coating highlighting VOC limits and chemical component limits.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.

B. Applicator: Company specializing in performing the work of this section with minimum five (5) years experience and approved by manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for finishes.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, VOC content, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions. Storage space shall be designated by the Contractor and approved by the Architect.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

1.10 EXTRA MATERIALS

A. Provide 1 gallon of each color and surface texture to Owner at the completion of the project.

B. Contractor shall label each container with color, type, texture, and room locations in addition to the manufacturer's label. Contractor shall also provide detailed listing by room of color, type, and texture along with manufacturer's name and identification number.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer's: Best quality materials as manufactured by one of following manufacturers will be acceptable:

1. For Brush, Roller or Spray work:

a. Sherwin Williams
b. Benjamin Moore
c. Pittsburgh Paints

B. Quality: All products not specified by name shall be "best grade" or "first line" products of acceptable manufacturers. See Part 3- Execution for materials required for this project. Where possible, provide materials of single manufacturer.

2.2 MATERIALS

A. Coatings: Ready mixed. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.3 FINISHES

A. Refer to schedule at end of section for surface finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application to the Architect and General Contractor.

C. Test shop applied primer for compatibility with subsequent cover materials.

D. Allow masonry work to cure for at least 30 days before coating. Gypsum board shall be allowed to dry for 15 days before coating.

3.2 PREPARATION

A. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Seal with shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

F. Galvanized Surfaces: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.

J. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

G. Allow applied coat to dry before next coat is applied.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Divisions 15 and 16 for schedule of color coding and identification banding of equipment, duct work, piping, and conduit.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names and numbering.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

J. Finished work is to be adequately covered with uniform color and finish. The number of coats herein specified being a minimum, this contract shall provide any additional coats to produce a first-class job. Architect may select accent colors or deeptone colors (contrasting bright colors) for interior painted walls or ceilings. Where bright colors are selected, apply extra coats of paint where required to obtain completely opaque surface. Make allowances for 10 percent deep tones in bid. Additional labor or materials used for this purpose not allowable as extra cost.

K. Objects on Roof: Paint all metal objects on roof including, but not limited to, rooftop mechanical units, flashings, roof drains, vents, exhaust fans, air intake hoods, roof hatches, etc. as specified under ferrous, zinc coated metals.

L. Allow the following minimum drying time between coats:

1. Exterior work-48 hours.

2. Interior work-24 hours.

3.5 PROTECTION AND CLEANING

A. Protection: Protect floors and adjacent surfaces from paint smears, spatters and droppings.

1. Cover fixtures not to be painted. Mask off areas as required.

2. Finish Hardware: Ensure hardware is removed prior to starting painting operations and that it is replaced only after painting operations have been completed.

a. Hardware Removal and Replacement: Section 08710.

B. Damage to Other Work: Be responsible for damage done to adjacent work. Repair damaged work to satisfaction of Architect. Replace materials damaged to extent that they cannot be restored to their original condition.

3.6 SCHEDULE OF COATINGS

A. Interior:

Surface		Area	Type, Luster & Coats
1.	Cementitious Materials	New/Exist. CMU	1 coat: S-W PrepRite Block Filler, B25W25 (16 mils wet, 8 mils dry) 2 coats: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (4 mils wet, 1.6 mils dry per coat)
2.	Gypsum Board	New ceilings, walls, and bulkheads	1 coat: S-W Harmony Low Odor Interior Latex Primer, B11W900 (4 mils wet, 1.3 mils dry per coat) 2 coats: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series or S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series. (4 mils wet, 1.6 mils dry per coat)

- END OF SECTION 09 90 00 -

SECTION 220499
PLUMBING SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The work to be performed under these Specifications shall include providing all labor, materials, and equipment necessary to furnish and install, complete, properly, and fully all plumbing work as shown on the Drawings or herein specified. It is the intent of these Specifications that a complete operating system be installed; this Contractor shall carefully examine the site, drawings, and Specifications, and shall include all items necessary to accomplish this purpose. The work, in general, shall include, but shall not be limited to the following:

1. **Provide revised wet fire protection systems for areas indicated on Architectural Plan.**

1.3 WORK BY OTHER TRADES

A. Cutting, patching, painting, electrical, revised **fire protection,** etc., shall be done by the affected trade at this Contractor's expense for changes required in work already installed or work required by other trades for changes made by this Contractor in type or size of equipment purchased.

1.4 WORK NOT INCLUDED

A. The following construction and equipment related to the work under this Contract will be provided by others:

1. Openings in new exterior walls. (General Contractor)

2. **Revised building fire protection system. (Separate Fire Protection Contract)**

PART 2 – PRODUCTS

2.1 NOT APPLICABLE TO THIS SECTION

PART 3 – EXECUTION

3.1 NOT APPLICABLE TO THIS SECTION

END OF SECTION 220499

SECTION 221420
WET – PIPE FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. All fire protection system work shall be completed by a licensed, certified, Fire Protection Contractor acting as a subcontractor to the Plumbing Contractor. All work shall be directly coordinated with the local Fire Department.

C. The Plumbing Contractor shall furnish and install a flanged connection at interior water service entrance for beginning the Fire Protection Subcontractor's work. Final connections to flange will be completed by the Fire Protection Subcontractor.

D. All pipe materials shall be subject to the acceptability of that material with the prevailing local fire and plumbing codes, NFPA 13.

E. The Drawings and Specifications for this project are generally schematic and are intended for bidding purposes only **and are not intended to cover each item required for a total system as outlined in NFPA 13.** The minimum spacing, quantity and arrangement of proposed sprinkler locations, equipment, piping, and standpipes indicated on the Drawings generally are diagrammatic. The exact arrangement, sizes, quantity and spacing required by the agencies having jurisdiction shall be indicated on the Working Drawings that are to be prepared by the Contractor.

1.3 SCOPE

A. The revised fire protection work to be performed shall include the following, but not necessarily limited to:

1. Furnish and install Contractor-hydraulically designed revised wet fire protection systems, including all required drain piping and accessories, complete in every detail.

2. Directly after award of Contract, regardless of dates of existing flow tests; or flow test data obtained or shown on any drawings; and prior to any submittal, the Contractor shall be responsible for conducting and obtaining new flow test data. Obtain water flow, pressure, capacity data, elevations, and other related pertinent information from the nearest available fire hydrant(s), and as arranged with the Water Authority serving the building. Arrange any times and dates with the Water Authority. Water flow test data obtained from the Water Authority will not be acceptable, regardless of when such flow tests were performed. Include all costs involved with obtaining the flow test data, including the use of special tools, equipment, and accessories and include in the Contract Bid. Typed copies of confirmed flow test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

3. Directly after award of Contract, the Contractor shall obtain and confirm latest test data performed on the existing fire pump system. Existing test data shall be obtained from the Owner of the building and must have been performed within the last twelve (12) months of the Contract Bid Date. If later than twelve (12) months, the Contractor shall perform

the necessary fire pump system tests to obtain this data. Include all costs involved with conducting the pump test and include in the Contract Bid. Scheduling of the fire pump system tests shall be directly coordinated with the Owner and the local Fire Department. Typed copies of fire pump test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

4. Include all tests, permits, and fees, including all costs involved.

5. Contractor shall complete all Contractor's Material and Test Certificates for above ground installations.

1.4 CODE COMPLIANCE

A. All fire protection work and materials herein described shall comply with all applicable federal, state, county, health, and local laws, ordinances, rules and regulations, and all other local authorities having jurisdiction and shall be subject to the approval of these authorities, notwithstanding anything in these specifications to the contrary. In addition, all work and materials to be provided under this Section of the Specification shall conform to the applicable requirements of the National Board of Fire Underwriters Standards, and the National Fire Protection Association Standards; special reference is made to NFPA 13, Standard for the Installation of Sprinkler Systems, Standard for the Installation of Standpipe and Hose Systems. All threads shall conform to the local Fire Department Standards; confirm prior to ordering.

1.5 SHOP DRAWINGS

A. Product Data: Submit manufacturer's technical product data and installation instructions for all fire protection materials and products.

B. Approval Drawings: All fees for this approval shall be by this Contractor. Prepare approval drawings of the fire protection systems coordinated with other mechanical, electrical, structural and general building drawings, of the fire protection systems proposed by the Plumbing Contractor and submit prints of the drawings to the appropriate governmental, health, and underwriting agencies for their review and approval. Prints bearing the approval stamp of the Underwriting Agency, authorized Fire Marshal and other Authorities having jurisdiction shall be submitted to the Architect prior to the commencement of any fabrication or installation of any portion of the system. The drawings shall include all of the following information and whatever additional information that may be required by the authority having jurisdiction.

1. All sets of drawings with appropriate NFPA standards listed.

2. System type.

3. Total number of risers.

4. Sprinkler spacing and locations with dimensions showing all lighting fixtures, diffusers and return air grilles.

5. Occupancy type.

6. Hazard classification.

7. Hangers, types and details.

8. Temperature and type of sprinkler heads.

9. Sprinkler system accessories.

C. Approval Calculations: Prepare hydraulic calculations of fire protection systems to determine all pipe sizes. Submit to Agency having jurisdiction for approval. Submit one approved copy, bearing stamp and/or signature of Agency having jurisdiction to the Architect before proceeding with the installation.

D. Certificate of Installation: Submit certificates upon completion of fire protection work which indicates that work has been installed and tested in accordance with NFPA 13, and also that the system is operational, complete and has no defects.

E. Record Drawings: At project closeout, submit record as-built drawings of installed fire protection piping and products.

F. Maintenance Data: Submit maintenance data and parts lists for fire protection materials and products. Include this data, product data, shop drawings, approval drawings, approval calculations, certificate of installation and record drawings in maintenance manual.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION PIPING INSIDE BUILDING

A. Pipe:

1. All wet system piping herein specified shall be UL Listed and FM Approved. Pipe shall be as manufactured by Allied Tube & Conduit, Youngstown Tube Co., or Wheatland Tube Company. For the wet-pipe systems only, all piping that utilizes threaded fittings shall be Schedule 40 black steel. “Plain-end” pipe/fittings and threadable light-wall pipe are not permitted. Sprinkler piping 1-1/4” in diameter or larger, connected by welded, flanged fittings or roll grooved fittings, shall be Schedule 40 or Schedule 10 as permitted by NFPA 13. Cut grooves are not permitted. All sprinkler piping 2” in diameter and smaller (that is not roll grooved or welded) shall be Schedule 40 utilizing screwed fittings (plain end fittings will not be accepted). All miscellaneous drain and test piping and fittings shall be Schedule 40, internally and externally galvanized. All piping shall include factory coating of the inner wall of piping, to guard against MIC (microbiologically influenced corrosion). The coating shall adhere to the wall of the pipe, thereby providing protection against contamination and pipe deterioration by impeding the attachment of microbes to the pipe wall.

   a. Where piping is exposed it shall be steel pipe, as specified herein.

2. Instead of hard-pipe armovers above ceiling areas, the Contractor will be permitted to use a flexible stainless-steel hose to connect sprinkler heads to the branch lines. System shall be UL Listed and FM Approved type, conforming to NFPA 13, as manufactured by FlexHead Industries, Inc., Fivalco, Inc., AquaFlex, or Gateway Tubing, Inc. Flexible hose shall be rated up to 300 psi, in 2-6 foot lengths. Each system shall be factory pressure and leak-tested. Approval on models of flexible metal sprinkler hose is limited for use in commercial suspended or sheetrock ceilings, with ceiling bracket assembly, without hangers. System shall be approved for use in suspended ceilings with light, medium, and heavy load grids (ASTM C635, C636). System will not be acceptable for exposed sprinkler system installations. System shall be installed in strict accordance with manufacturer’s installation instructions. System installation must be acceptable to the Owner and Fire Insurance Carrier.

B. Hangers for the fire protection system shall be UL Listed, FM approved. Contractor's attention is directed to "Unsupported Armover Lengths", for pipe hanger installations for pressures above and below 100 psi, in accordance with NFPA 13

C. Fittings:

1. For wet-pipe system, 150 psi, screwed malleable iron, or Victaulic FireLock ductile iron fittings and FireLock EZ ductile iron, Nibco Steelok, or Tyco couplings for grooved end piping. Grooved end fittings and couplings shall be UL Listed and FM approved and shall be the products of a single manufacturer. Grooving tools shall be supplied by the same manufacturer as the grooved components.

2. Flange adapters shall be ductile iron, flat faced, designed for incorporating flanged components with ANSI Class 125 and 150 bolt-hole patterns to a grooved piping system. Victaulic Style 741 or 744 or approved equivalent.

D. Valves shall be as manufactured by Nibco, Victaulic, or Tyco.

1. For sizes 2" and smaller, valves shall be bronze ball type, 175 pound WWP minimum, UL, FM, threaded or grooved body style, the Victaulic FireLock Series 728, or approved equivalent. The Nibco No. T-104-0, threaded, UL, FM valve, bronze gate, 175 pound WWP minimum, will be acceptable, or approved equivalent. For sizes 2-1/2" and larger, valves shall have iron body, 200 pound WWP minimum, UL, FM, with resilient wedge, flanged ends, the Nibco F-607-RW, grooved ends, Victaulic Series 771, or approved equivalent.

2. Inspector's test and drain valves shall be 175 pound WWP minimum, bronze screwed, angle, or straight globe valves, UL Listed, rubber disc, the Nibco No.'s KT-65 UL, KT-67 UL, KT-211-W-UL, or approved equivalent. The Nibco No. KT-580-70-UL and No. KT-585-70-UL, threaded, bronze ball valves, UL listed, 175 pounds WWP, will be acceptable.

3. The AGF Model 1000 Test and Drain, UL, FM approved, Victaulic Styles 720 TestMaster Alarm Test Module, or Sure-Test shall be utilized for drain systems.

E. Sprinkler Heads: All sprinkler heads shall be the product of a single manufacturer, UL Listed, and FM approved. All heads shall be the same model year and style throughout. The Architect must approve any deviations. Sprinkler heads shall be of a type, upright, pendent, or sidewall that is best suited to the conditions in which they are installed. Heads shall be as manufactured by Viking, Tyco, or Victaulic. Provide quick response sprinkler heads where required, in accordance with NFPA requirements. Heads which must be painted, shall be factory-painted only. Where required, heads shall be of a design suited to the protection of areas having irregular building design and structural arrangements such as cornices, soffits, beams and columns or building environmental systems such as light fixtures, grilles and diffusers, or building furnishings and equipment. Full consideration shall be given in the spacing of heads, of the type of head, and the arrangement of the piping to afford the protection required to be installed. Temperature ratings of all heads shall be coordinated with the NFPA 13 requirements. Provide higher temperature heads near heat – producing equipment. The Victaulic "strapless" style sprinkler heads will not be acceptable. The finish and type of sprinkler heads in finished areas must be approved by the Architect.

1. In general, sprinkler heads in finished areas with ceilings shall be fully recessed, concealed type. Heads shall include finished flat coverplate installed flush with ceiling, the Viking Mirage (QR, 5.6K, VK462), Victaulic Model V38, or approved equivalent. Finish and color of flat coverplate shall be as selected by the Architect.

2. Where indicated on the drawings, sprinkler heads shall be semi-recessed, extended coverage, chrome finish, the Viking Microfast (QR, 5.6K, VK600), or approved equivalent.

3. Use chromed heads on exposed piping or concealed piping in finished areas.

4. Sidewall heads having a bronze finish or chrome finish shall be the Viking Model M (QR, 5.6K, VK305), Victaulic Model V27, or approved equivalent.

5. Concealed horizontal sidewall sprinkler heads shall be quick response, extended coverage, UL Listed, and shall be the Viking VK630, with 14' x 26' coverage, Reliable, or Tyco.

6. In areas subject to corrosive atmosphere, heads shall be lead coated, Nickel-Teflon coated, or wax coated as required.

7. Coordinate installation of sprinkler heads with surface mounted lighting fixtures for proper clearances.

8. Install sprinklers under all ducts or obstructions greater than 48" in width in accordance with NFPA 13.

F. In accordance with UL listing requirements, protective caps or straps shall be required for all glass bulb sprinklers. The caps or straps shall be removed from the sprinklers only when the system is "placed in service", in accordance with NFPA definitions. Protective caps and straps shall be removed only using means in accordance with manufacturer's installation instructions. "Dropped" glass sprinklers, with or without protection, shall be replaced. Solder element sprinklers are not required to be protected with caps or straps.

G. Flushing: Completely flush out piping systems included under this Contract.

H. Escutcheons: All pipe escutcheons shall be chrome, cast brass, set screw type.

PART 3 - EXECUTION

3.1 SPRINKLER SYSTEM INSTALLATIONS

A. All systems shall be fully automatic, shall be complete in all detail, and shall be provided with all the required components and devices necessary to install approved systems.

B. The layout of the sprinkler system, the arrangements of the heads; and the location and size of main and branch piping shall be developed from the design requirements of the applicable sprinkler criteria and the limitations imposed by the structural and architectural design. However, the degree of protection, hence the exact spacing and arrangement of the sprinkler heads and pipe sizes in any area shall be as required by the authority having jurisdiction.

C. Rearrangement of branch piping and adjustment of the pipe sizes, where proven by hydraulic calculations and when approved by the authorities having jurisdiction, and where compatible with the building design, may be made in the preparation of the Shop Drawings.

D. In finished areas, sprinkler heads shall be uniformly spaced and patterned to suit the ceiling finishes, decorations and interferences. In unfinished areas, the pattern of spacing and the coverage shall be as determined by the shape of the space and the interferences caused by construction details and the furnishings of the space. Maximum spacing shall not exceed that

permitted by the authority having jurisdiction. Sprinkler heads in “lay-in” ceilings shall be centered in both directions.

E. Additional spare sprinkler heads of each type shall be provided to the Owner. Not less than six (6) heads or 2% of the total number of each type of head shall be furnished to the Owner for storage. Furnish and install a metal wall storage cabinet, mounted where directed by the Architect. Storage cabinet shall be as manufactured by Tyco, Victaulic, or Viking. A wrench suited to each type of head shall also be provided in the cabinet.

F. Test pipes with control valves shall be provided as required in the fire protection system.

G. Grooved joint piping systems shall be installed in accordance with the manufacturer's guidelines and recommendations. All grooved couplings, fittings, valves, and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing. A factory-trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools and installation of grooved piping products. Factory-trained representative shall periodically review the product installation. Contractor shall remove and replace any improperly installed products.

3.2 FIRE PROTECTION SYSTEM TESTS

A. Before the completed revised fire protection system is accepted by the Owner, the entire system included under this Contract shall be pressure tested by the Contractor and approved in the presence of representatives of the Owner, the Architect, local Fire Department, local authorities, the Insurance Underwriters, and any other parties directly concerned.

B. This Contractor shall furnish all labor and equipment and shall conduct and bear the cost of all required tests of the fire protection system. This Contractor shall give all concerned parties three days advance notice of scheduled tests; 48 hours to Water Authority

C. The entire fire protection system included under this Contract shall be tested under a hydrostatic pressure of not less than 200 lbs. for at least two hours, or at 50 psi in excess of the maximum static pressure when the maximum static pressure is in excess of 150 psi, or as otherwise required or directed by the local Fire Department. Testing of underground service main piping shall conform to NFPA 24 requirements. All defective work shall be promptly repaired or replaced with new pipe and fittings, etc.

D. Tests shall be repeated until the installation receives the approval of the Architect and all parties concerned.

E. Any damage resulting from the tests shall be repaired and/or damaged materials replaced, all to the satisfaction of the Architect, at the expense of this Contractor.

END OF SECTION 221420

SECTION 230505

HVAC SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The Contract requirements include the providing of all labor, materials, equipment and appliances, and in performing all operations in connection with the installation of HVAC Construction Work complete for this Project, in strict accordance with this Section of the Specifications and the applicable drawings.

B. At the completion of the project, all systems shall be calibrated, tested, balanced, commissioned, and all systems shall be operating as intended.

C. Contractor is hereby bound by all applicable portions of all Contract Documents and Supplemental Specifications bound herein or included by reference.

D. In all cases where a device or part of equipment is herein referred to in the singular, such reference applies to as many such items as are required to complete the installation.

E. Provide all related and miscellaneous components or appurtenance to make all specified systems complete and functional.

F. Perform all work in accordance with work of all other contractors on this project.

G. Install work in phases during the construction period; coordinate mechanical schedule and operations with other trades and with construction schedule.

H. The work to be performed by the HVAC Contractor under these Specifications and the accompanying Drawings comprises the furnishing of all labor, materials, tools, and other services and facilities necessary for the complete installation of, but not necessarily limited to the following:

1. Demolition
    a. Perform pre-demolition tested as indicated on the Contract Drawings. Measure and record air flows at all indicated air devices prior to demolition work, and submit record report to the Architect.
2. New

a. Provide all testing and balancing of all existing to remain air devices, as indicated on the Contract Drawings.

1.3 WORK BY OTHERS

A. The following construction and equipment related to the work under this Contract will be furnished or provided by others, unless noted otherwise:
   1. Final painting of new interior surfaces. (General Contractor)
   2. Final painting of existing interior walls, floors and ceilings where the surfaces are being refinished and remodeled under the General Contract. (General Contractor) Where the existing area is to be repainted by the General Contractor, the HVAC Contractor must repair his openings ready to paint. Refer to General Construction drawings for finishes.
   3. Recesses and opening in new construction for piping and equipment. (General Contractor)

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 230505

SECTION 230506

BASIC HVAC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 HVAC WORK

A. The word "building" used throughout these specifications shall be interpreted to mean the entire Building Complex.

B. The actual runs and locations of all piping, ductwork, equipment, etc., shall be determined at the site and shall be installed to meet the various conditions at the building. It is, however, the HVAC Contractor's responsibility to predetermine the exact locations of ductwork, piping, and equipment, and to notify the other contractors accordingly to avoid confliction with other lines and equipment. Any changes necessary to conceal pipes, ductwork or clear pipes and equipment of other trades shall be made without additional expense to the Owner. This Contractor shall be responsible to create ductwork and HVAC piping coordination drawings and distribute to other contractors for coordination and sign off. Refer to Subsection 3.5 for further clarification.

C. No piping, ductwork or equipment shall be installed without first obtaining sign off from the other trades. Should such installation occur and then subsequent conflicts arise, this Contractor shall, at his own expense, remove all that is in conflict and reinstall appropriately.

D. All work shall be executed and all equipment constructed and installed in accordance with the requirements of the State Building Code, the Department of Labor and Industry, ASME, Department of Environmental Resources, Department of Labor, Safety and Health Regulations for Construction, OSHA, National Fire Protection Association, the National Electrical Code as amended to date of bidding, and all federal, state, county and local ordinances and regulations. Nothing contained in these specifications or shown on the drawings shall be construed to conflict with the aforesaid codes, ordinances, or regulations. Certificates of approval shall be obtained from any department issuing same, and shall be turned over to the Owner at the completion of the work. All fees and permits required shall be satisfied and obtained by the Contractor and the cost shall be included in the Contract price.

E. The Contractor shall carefully examine the general building drawings and all mechanical and electrical drawings, and carry on his work so as not to delay or interfere with the work of other trades. He shall obtain in writing from the other contractors such data as is necessary to coordinate his work with other branches. As the work in the building nears completion, all

threading, cutting, etc., shall be done where directed by the Architect. Upon completion of the work, all remaining waste materials and rubbish resulting from the Contract work shall be removed from the building and premises. The Contractor shall review the phasing schedule and meet all requirements of the schedule. The building must be kept in use at all times.

F. Where the phrase "or approved equivalent," "or equivalent" or "approved" appears in these specifications, it shall refer to the approval of the Architect on the material or equipment involved.

G. The terms "The Contractor" or "This Contractor" or "the HVAC Contractor" mentioned in these specifications refers to the Contractor responsible for the work and equipment included in these specifications.

H. The General Contractor will provide chases and openings in walls, floors, ceilings, and partitions of new construction to receive pipe lines, risers, ducts, and other equipment insofar as it is possible to predetermine the exact location, but the Contractor shall install his work sufficiently in advance of the building construction to permit his work to be built into place. This Contractor shall advise the General Contractor of the exact size and location of all chases and openings required for the installation of his work, and shall check size and location of all such chases and openings provided by the General Contractor.

I. The Contractor shall do all cutting and patching required for the installation of his work.

J. Advance work as rapidly as possible to permit the heating and cooling systems to be used when it is required for all areas of the building. The installation of equipment shall follow the phasing schedule. Instruct the Operating Personnel as to the proper care and maintenance of all systems. However, this Contractor shall operate the new systems until the new systems are complete while the building is under construction. He shall also coordinate the operation of the system with the Owner so that heat remains on in all areas during construction. Provide all required temporary heat as directed by the Construction Manager.

K. Equipment and materials of similar types shall be of the same manufacturer unless specifically indicated otherwise on the drawings or herein specified. All materials shall be strictly in accordance with the quality, style, and sizes as specified herein. Manufacturers' names and plate numbers are given in the specifications to denote a standard of quality, style, size, and type and shall exclude material of other manufacturers. The Contractor shall make final connections between all equipment furnished under this Contract and equipment furnished under other contracts as noted.

L. The materials used throughout shall be those of reputable manufacturers and shall be new and the best of their respective kinds. All equipment, components and materials shall be installed in a neat and workmanlike manner in accordance with best trade practices, manufacturer's recommendations, and applicable codes and standards and by men skilled in each particular branch of the work assigned to them. All work shall be installed subject to the approval of the Architect.

M. The Contractor shall be entirely responsible for all apparatus, equipment and appurtenances furnished by him or his Subcontractors in connection with the work, and special care shall be

taken to protect all parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds, or other means to prevent dirt, grit, plaster, or other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep all open ends of pipes, ductwork, VAV/CAV Boxes and all other equipment, etc., closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy waterproof tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be suitably dried out before placed in service. Materials and equipment shall be stored in areas designated by the Architect.

N. Grades, elevations and locations shown on the drawings are approximately correct; however, the Contractor shall field check and otherwise verify all such data at the site before proceeding with the work. The Contractor shall make necessary survey equipment available at all times and shall make use of such equipment wherever necessary to properly install his equipment.

O. The Contractor shall visit the site and thoroughly acquaint himself with conditions existing at the site before submitting his proposal as he will be held responsible for the installation of the work complete in every detail. The Contractor shall especially review the phasing schedule and ensure compliance with this schedule.

P. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

Q. Carefully examine all drawings included under this Contract and drawings included under other contracts and report any discrepancies noticed to the Architect as this contractor shall be responsible for the HVAC system installation in its entirety.

R. Due to the small scale of the drawings, it is not possible to indicate all offsets, fittings, valves, dampers, access panels, and similar parts which may be required. The drawings are diagrammatic and generally indicative of the work to be installed. The Contractor shall carefully investigate the structural and finish conditions affecting the work and arrange all work accordingly, furnishing necessary parts and equipment as may be required to meet the various conditions.

S. Contractor shall layout his work from dimensions of Architectural Drawings.. Layouts in congested areas should not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry, OHSA and the National Electrical Code.

T. The Contractor shall furnish the services of manufacturers' representatives for all equipment furnished under these Contract Documents. The amount of factory service provided by the Contractor shall be as normally recommended and furnished by the various equipment manufacturers unless specified otherwise. Testing of such systems and equipment shall be made under the direct supervision of competent authorized service representatives and the Commissioning Agent. Any and all expenses incurred by the equipment manufacturers' representatives shall be borne by the Contractor.

U. All equipment and materials shall be manufactured in accordance with national standards established by manufacturer's associations, engineering and testing societies, such as NBMA, NEMA, ASTM, AMCA, ASME, ANSI, ACI, etc., where such standards have been established.

V. When the installation is reported in writing by the Contractor to be complete and ready for acceptance, tests and inspection shall be made by the Contractor in the presence of the Architect to ascertain whether it complies with the specifications and Contract, and upon its failure to do so, the Contractor shall at once remedy all defects and shortcomings and any additional tests that may be required shall be entirely at the Contractor's expense. All of the testing work shall be done when and as directed by the Architect before the system is accepted.

W. The Architect/Engineer reserves the right to revise locations of piping, ductwork, locations of equipment, etc., within the building as long as sizes remain the same.

X. In all cases where equipment and materials are specified in the singular or plural number, it is intended that such reference shall apply to as many such items as are required to complete the installation.

Y. The Contractor will be responsible for the completion of all work included under this Contract and shall employ skilled and qualified tradesmen as necessary to satisfy all work and trades.

1.3 PERMITS, CODES AND INSPECTIONS

A. Obtain and pay for permits and inspections required by laws, ordinances, rules and regulations having jurisdiction for work included under Contract. Obtain certificates of each required inspection as construction progress dictates, and submit same to the Owner's Representative prior to acceptance of the Work.

B. Systems and installation work shall be completed in accordance with the 2015 International Building Code, 2015 International Mechanical Code, and 2015 International Energy Conservation Code.

C. Do work in accordance with all applicable requirements including but not limited to National Fire Protection Association, Underwriter's laboratories, Inc., National Electrical Code, O.S.H.A., and other regulatory bodies having jurisdiction over this class of work. Where applicable, materials and equipment shall bear stamps or seals of NFPA, UL, ASME, AMCA, NEMA, IEEE, NEC, and other recognized regulating agencies.

1.4 DEFINITIONS

A. To clarify and establish relationships for responsibility of work to be performed under this section, designations underlined in the subsequent paragraphs of this Article are defined.

B. Provide shall mean that work or equipment thus described shall be furnished and installed complete and all responsibility and costs relative thereto shall rest with designated Contractor or Subcontractor.

C. Furnish shall mean that equipment thus described shall be purchased by this Contractor or Subcontractor and delivered to job site for installation or erection under this or another contract or subcontract. Furnishing contractor shall be responsible for including installation data and competent supervision assistance to coordinate equipment or components into working and operable systems.

1. Magnitude of installation data and supervision assistance shall be as specifically stated elsewhere herein, or the minimum as interpreted by the Owner's Representative.

D. Contractor as stated herein shall mean HVAC Contractor or Subcontractor unless specifically designated as General Contractor, electrical Subcontractor, etc. If trades or sections of work are prime or sublet, the term "Contractor" shall be used as applicable to Contractor or Subcontractor as defined by the division established by the Contract Documents.

E. Contract as stated herein shall mean HVAC Contract or Subcontract unless specifically designated as General Contract, Electrical Subcontract, etc. If trades or sections of work are prime or sublet, the term "Contract" shall be used as applicable to Contract or Subcontract as defined by the division established by the Contract Documents.

F. Inspect, Inspection, Inspector: To inspect the work of contractors means to observe the work of those contractors and/or subcontractors on all tiers responsible for implementing Consultant's plans, specifications, reports, and other instruments of professional service. An inspector has no authority or responsibility to direct any construction workers, and may not stop the work. An inspector is not responsible for, and does not have the education, training, or experience needed to affect the means, methods, sequences, or operations of construction, or safety procedures attendant thereto.

G. Accepted shall mean accepted by the Owner's Representative.
Approved shall mean approved by the Owner's Representative.
Equivalent shall mean equivalent approved by the Owner's Representative
Directed shall mean directed by Owner's Representative.
HC or HVAC shall mean Heating, & Ventilating Contractor.
PC shall mean Plumbing Contractor.
EC shall mean Electrical Contractor.
GC shall mean General Contractor.*
NEC shall mean National Electrical Code, latest revision.
AFF shall mean Above Finished Floor or Grade to centerline.
FBO shall mean Furnished By Others.
*"General" Contract Work may be performed by various contractors.
See documents for division of responsibilities.

1.5 SHOP DRAWINGS AND SUBMITTALS

A. Refer to Architect’s specifications for submittal requirements.

B. Submit Record (As-Built) Drawings. Refer to Paragraph 3.03

1.6 SUBSTITUTIONS

A. Throughout the Specifications, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the bidder may assume the phrase "or approved equivalent," except that the burden is upon the bidder to prove such equality. If the bidder elects to prove such equality, he must request the Architect's approval in writing to substitute such item for the specified item, and shall submit supporting data, and samples if required, to permit a fair evaluation of the proposed substitution with respect to quality, serviceability and warranty. All data pertinent to the proposed substitution shall be submitted to the Architect at least 10 days prior to the bid date for evaluation and review purposes. If the Architect accepts the proposed substitution, an addendum will be issued to all bidders advising all bidders that this substitution will be acceptable from all bidders.

B. Substitutions of equipment other than that specified must be very carefully checked to assure that no problems will occur due to dimensional differences, code requirements, connection points, weights, etc. Where the Contractor elects to substitute materials or equipment approved by the Architect for those specified, the Contractor will be held responsible for all architectural, structural, mechanical, and electrical changes required for the installation of the substituted materials at no additional cost to the Owner. All tests required to substantiate the equivalence of the material will be the obligation of the Contractor.

C. When this Contractor desires to furnish equipment of a manufacturer other than that specified or intended, he shall include a complete specification of the substituted item, along with each submission copy of shop drawings, indicating the necessary modifications to the substituted product to satisfy the requirements of the Contract Specifications. Manufacturer's specifications shall be written as close as possible over the Contract Specifications and each paragraph shall bear the same paragraph number as the Contract Specifications so that close comparison can be made. All submissions will be rejected should they not include the comparison specification. Comparison specification shall be submitted for approval 10 days prior to the Bid Date. If prior approval is not obtained, no substitutions will be considered and the Engineer reimbursed for time spent to reject and return such submission.

D. The verification specification shall include the exact wording of the Contract Specification and the revised wording identified properly indicating all the deviations proposed. If no deviations are noted, the Contractor must furnish the material or equipment in accordance with the Contract Specifications.

E. Should the Contractor elect to propose a substitution after the project has been awarded, the Contractor will be billed for the time spent by the Architect and his consultants in evaluating the proposed substitution. This billing shall occur whether the proposed substitution is accepted or rejected and shall be at the rate of the direct cost to the Architect times a 2.5 multiplier.

F. The submissions are the Contractor's documents, and the Architect's and Engineer's approval constitutes an acknowledgment that the documents have been submitted and nothing more. It is the Contractor's responsibility to check his own submissions for compliance with the Contract Documents and job conditions.

1.7 QUESTIONS AND CLARIFICATIONS OF BID DOCUMENTS

A. Bidders shall not rely on any verbal clarification of the Drawings and Specifications. Any questions or clarifications shall be referred to Engineer at least seven (7) working days prior to bidding to allow for issuance of an addendum.

1.8 MECHANICAL PLANS

A. The mechanical plans are intended to be diagrammatic and are based on one (1) manufacturer's equipment. They are not intended to show every item in its exact location, the exact dimensions or all the details of the equipment. The Contractor shall verify the actual dimensions of any specified or substituted materials and equipment to ensure that they will fit in the available space. All apparatus shall be located as closely as conditions will permit and deviations there from shall be made only with the consent of the Engineer and without additional charge. The right is reserved by the Engineer to make any reasonable changes in the location of the equipment prior to rough-in without invoking additional expense. This contractor shall be responsible to create and distribute for sign-off amongst other trades ductwork and HVAC piping coordination drawings. Refer to Subsection 3.5 for further clarification.

1.9 SPECIAL ENGINEERING SERVICES

A. In the instance of Mechanical and Control systems, such as all major and special equipment, heating equipment, controls, fans, or similar miscellaneous systems and equipment, the installations, final connections and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be employed by the respective equipment manufacturer and/or an authorized representative. Any and all expenses incurred by these equipment manufacturers' representatives shall be borne by the Contractor.

1.10 SCHEDULE OF WORK

A. The Contractor shall arrange his work to comply with the Architect’s schedule and the published or revised phasing schedule. The Contractor shall submit a complete schedule of work to the Architect for approval at the beginning of the Contract in accordance with the phasing schedule. The schedule shall clearly indicate the proposed order in which the various parts of the work will be undertaken and the estimated time required for the completion of each particular part of the work. All work shall be coordinated with work being performed by contractors of other trades, with the Owner and phasing schedule.

B. The schedule of work may be revised periodically during the course of construction, but each revised schedule must be approved by the Architect.

1.11 LOCATIONS

A. Obtain detailed and specific information regarding location of all equipment, as the final location may differ from that indicated on drawings. Relocate work improperly placed because

of Contractor's failure to obtain this information and reinstall as directed, without additional expense to Owner.

B. The design is subject to such revisions as may be necessary to overcome building obstructions. No changes are to be made in location of equipment without prior written approval by Architect.

C. Owner's Representative reserves the right to change locations of equipment, diffusers, registers, thermostats, plumbing fixtures, floor drains, and other items prior to roughing-in, up to a distance of 25 feet without additional charge by the Contractor.

D. Door swings may vary from plans. Take note of actual door swings at time of rough-in. Do not install thermostats, switches or other items behind the swing of any door.

1.12 PAINTING

A. All painting shall be included under the General Contract.

1.13 DRAWINGS AND SPECIFICATIONS

A. Carefully examine the drawings and specifications for architectural, structural and other Divisions and Sections of the Work. If any discrepancies occur between the drawings, or between the drawings and specifications, report such discrepancies to the Owner's Representative in writing and obtain written instructions as to the manner in which to proceed. No departures from Contract Drawings will be made without prior written approval of Owner's Representative.

B. Report any discrepancies at least 72 hours prior to submission of a bid. Questions received less than 72 hours prior to date of bid opening will not be answered by formal written addendum. Oral and other interpretations or clarifications will be without legal effect. In the event such discrepancies are not reported and claims for extra charges to any contract result, such claims will be allocated to, and charged to, the Contractor who, in the judgment of Owner's Representative, is the responsible party.

C. In the event of questions or disputes as to intent or meaning of Contract Drawings or Specifications, an interpretation will be given by the Owner's Representative and said interpretation will be final and binding.

D. Specifications and the Drawings are not intended to define all details, finish materials, covers, fittings and special construction which may be required or necessary. Furnish, install and connect same in order to make installation complete and adequate as implied by Specifications and Drawings.

E. Drawings are diagrammatic only and do not show exact routes and locations of equipment. Familiarize yourself with the work of other contractors and arrange your work to avoid

conflicts. In the event of conflict of work with existing conditions and work of any other contractor, obtain a new approved location of work from Owner's Representative.

F. Because of the small scale of the Drawings, it is not possible to indicate offsets in piping, conduit and ductwork, pipe, fittings, valves, access panels and similar items which may be required to make a complete operating system. Carefully investigate conditions affecting work and install work in such manner that interferences between pipes, ducts, conduit, equipment, architectural and structural features will be avoided and provide such offsets, fittings, access panels or valves as may be required to meet conditions at the building, and in accordance with applicable codes or governing body so as to avoid such interferences, without additional cost to the Owner.

G. Specifications and drawings are complementary, include work shown on drawings but not specified, and vice versa, as if both shown and specified. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

H. Consider work new even though no mention is made of new, unless otherwise indicated to the contrary herein or on the drawings.

I. When work has been completed and before final approval, deliver to the Owner's Representative a complete set of prints of contract drawings, properly and clearly marked in colored pencil, to show all changes made in original contract drawings and to represent the work as constructed.

J. Contractor shall layout his work from dimensions of Architectural and Structural Drawings and actual dimensions of equipment being installed. Layouts in congested areas shall not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry.

1.14 UTILITIES

A. Be responsible for all coordination and scheduling of construction as necessary for the performance of work under your Contract.

B. Unless otherwise indicated, be responsible for payment of all utility charges for installation/connection/on site construction for work required under your Contract.

1.15 PROTECTION

A. Effectively protect at own expense, such of work, materials or equipment as are liable to loss, damage or injury during the construction period and be held responsible for any such loss, injury or damage until work is fully and finally accepted.

B. Refer to Division 01 for additional requirements.

1.16 SKILLED MECHANICS

A. Install work under the Contract in a neat and workmanlike manner. Work which in the judgment of the Owner's Representative is not so installed: remove and replace to his satisfaction, at your expense. Do work with workmen skilled in their respective trade. Leave areas broom clean and equipment clean of dirt, rust, dust, tags and fingermarks.

1.17 TRADE NAMES

A. Trade names and manufacturer's equipment numbers are used to amplify the specifications and establish type and quality of equipment specified.

B. If substitute equipment offered for use requires material or equipment beyond that shown or required by this contract, it will be provided at Contractor's expense, regardless of trade involved.

C. Substitutions will be accepted as delineated in Division 01.

1.18 PERFORMANCE OF EQUIPMENT

A. Materials, equipment and appurtenances of any kind shown on drawings, hereinafter specified, or required for completion of the work in accordance with the intent of these specifications, will be completely satisfactory and acceptable as regards operation, performance and capacity. No approval, written or verbal, of any drawings, descriptive data or samples of such material, equipment or appurtenances will relieve you of your responsibility to turn over complete installation of heating and ventilating systems to the Owner's Representative in perfect working order and in complete conformance with Drawings and specifications at completion of the work.

B. Any material, equipment or appurtenances, the operation, capacity or performance of which does not comply with requirements of Drawings and Specifications, or which is damaged prior to acceptance by the Owner's Representative will be held to be defective material and will be removed and replaced with proper and acceptable materials, equipment and appurtenances or put in proper and acceptable working order, satisfactory to the Owner's Representative.

1.19 AVAILABLE SPACE

A. Be responsible for verifying dimensions of available space for equipment to be installed under this Contract, and verify dimensions of new equipment prior to delivery. After delivery of new

equipment, if it is found that it does not properly fit available space, with required clearances, remove the equipment from the project site and provide equipment to fit available space, at no additional cost to Owner. Be responsible for rigging new equipment required under Contract, through the building, and provide cutting and patching of building construction for rigging of equipment to be installed under Contract, unless otherwise noted.

B. Should the proposed equipment require disassembly for entry through openings, be responsible for disassembling equipment for passage through the openings, and reassembling the equipment for installation at locations as indicated. Be responsible for proper operation and guarantee of disassembled and reassembled equipment; should equipment not operate properly or become damaged due to disassembly and reassembly, replace equipment at no additional cost to the Owner.

C. Carefully schedule delivery of equipment to project site in accordance with the Schedule of Work.

1.20 SOUND CRITERIA

A. Sound Pressure Levels (dB re MicroPascals) (through each octave band) of rooms shall not exceed the following:

Frequency Bands (HZ)							
Room	63	125	250	500	1000	2000	4000
Waiting Rooms, Corridors	60	55	50	45	40	35	30

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 CLEANING

A. At the completion of the work all parts of the installation shall be thoroughly cleaned.

3.2 RECORD (AS-BUILT) DRAWINGS

A. The Contractor shall maintain a complete set of Contract Drawings at the site and shall record all deviations in his work (in red ink or pencil) from that indicated on the Contract Drawings. Deviations shall be clearly and accurately recorded so that the Engineer can prepare final record (as-built) drawings using the Contractor's marked-up drawings. Dimensions shall be recorded

using permanent reference points such as columns, building walls and like items. Of particular importance are the locations of all interior and exterior underground utilities. These record drawings shall be submitted to the Architect prior to final acceptance.

3.3 WARRANTY

A. The Contractor shall warrant that the materials and workmanship used in the erection of this installation are as herein specified, and he shall provide all labor and materials required to make good any defects in same which become apparent within one year from date of acceptance of completed work providing such defects are due to faulty materials or workmanship and not to misuse of apparatus by the Owner, his employees, or tenants. Certain equipment shall be warranted or guaranteed for longer than one year from date of final acceptance where specifically mentioned in these specifications.

3.4 CUTTING AND PATCHING

A. Existing Construction

1. All openings in completed new work and in existing walls or ceilings of existing building construction required to install work under Contract shall be cut by this Contractor, except openings in existing exterior walls and existing roofs which shall be cut by the General Contractor. All rough patching made necessary by Contractor's cutting shall be this Contractor's responsibility and shall be performed by workmen skilled in the respective trades. Surfaces of patchwork shall match adjacent existing construction subject to approval of Owner's Representative. Holes required through existing walls shall be cut with a core drill and shall be drilled between ribs, beams or joists. Finish patching will be by General Contractor.
2. Coordinate location of equipment, sleeves and raceways with other contractors.
3. Rough patch all openings in existing construction created by Contractor, caused by removal of existing equipment, and associated materials under Contract, except openings in existing roofs which shall be patched by General Contractor. Finish patching will be by General Contractor.

END OF SECTION 230506

SECTION 230593

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Balancing Air Systems
   a. Constant-volume air systems

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 REFERENCES

A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.

B. ASHRAE – 2011 Applications Handbook: Chapter 38, Testing, Adjusting and Balancing.

C. NEBB – Procedural Standards for testing, Balancing and Adjusting of Environmental Systems.

1.4 SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

1.5 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or NEBB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or NEBB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC or NEBB as a TAB technician.
3. All field work by the Testing, Adjusting, and Balancing Firm shall be under the direct supervision of a registered Professional Engineer, licensed to practice in the Commonwealth of Pennsylvania and who is a full time employee of the firm.

B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 TESTING AND BALANCE REPORT

A. Provide the services of an independent qualified testing, adjusting and balancing firm as approved by the Owner’s Representative. The testing, adjusting and balancing firm shall submit evidence that it has been engaged in this type of service for a minimum of five (5) years and that it has balanced systems of comparable size and complexity as specified for the project.

B. HVAC Contractor and balancing firm are responsible for testing, adjusting and balancing air and water systems and balancing and adjusting existing equipment and systems where this equipment and systems are being altered under this Contract.

C. Coordinate the balancing work with all other Contractors, Temperature Control Subcontractor, Owner’s Representative and the Owner. Temperature Control Subcontractor shall adjust controls. Perform balancing of the heating systems when outdoor air temperature is averaging below 30°F and the cooling systems when outdoor air temperature is above 80°F.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts and Nonmetal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation. Verify that dirty filters have been removed and that new clean filters are in place.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for all air devices. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Check dampers for proper position to achieve desired airflow path.

D. Check for airflow blockages.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.
   a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

B. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

C. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 PROCEDURES FOR EXISTING SYSTEMS

A. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured pre demolition airflows..
2. Balance each air outlet.

3.7 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Air Outlets and Inlets: Plus or minus 10 percent.

3.8 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.9 FINAL REPORT

A. General: Prepare and submit four (4) copies of a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Field test reports prepared by system and equipment installers.
2. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Notable characteristics of systems.

12. Nomenclature sheets for each item of equipment.
13. Notes to explain why certain final data in the body of reports vary from indicated values.

D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Balancing stations.
4. Position of balancing devices.

3.10 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

END OF SECTION 230593

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 EXECUTION OF THE WORK

A. The scope of work shown on the drawings and in these specifications, Division 26 and 28 are all a part of this contract and shall be included in the base bid unless otherwise noted.

B. These Specifications call out certain duties of the Electrical Contractor and/or Subcontractors. They are not intended as a material list of items required by the Contract.

C. These divisions of the Specifications cover the electrical systems of the project. It includes work performed by the electrical trades as well as trades not normally considered as electrical trades.

D. Provide all items and work indicated on the Drawings and all items and work called for in the Specifications in accordance with the conditions of Contract (Division 1 General Requirements Documents). This includes all incidentals, equipment, appliances, services, hoisting, scaffolding, supports, tools, supervision, labor, consumable items, fees, licenses, etc., necessary to provide complete systems. Perform start-up and checkout on each item and system to verify the systems are fully operable.

E. Comply with all provisions of the Contract Documents including Division 1, General Conditions, and Supplementary General Conditions of the Specifications.

F. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these Specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

G. Examine and compare the Electrical Drawings and Specifications with the Drawings and Specifications of other trades, and report any discrepancies between them to the Engineer and obtain written instructions for changes necessary in the work. At time of bid the most stringent requirements must be included in said bid. Install and coordinate the electrical work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner approved by the Engineer. All changes required in the work of the Contractor caused by neglect shall be corrected at the expense of the Contractor.

H. It is the intent of the drawings and specifications to provide a complete workable system ready for the Owner's operation. These specifications are equipment and performance specifications. Items described or called out in the specification but not shown on the drawings are considered to be part of the project. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent are to be considered a part of the

contract. Installation of the equipment shall be in accordance with the N.E.C., manufacturer recommendation, and industry standards.

I. All material furnished by the Contractor shall be new and unused (temporary lighting and power products are excluded) and free from defects. All materials used shall bear the Underwriters Laboratory, Inc label provided a standard has been established for the material in question.

J. All products and materials to be new, clean, free of defects and free of damage and corrosion.

K. No exclusion from, or limitation in, the symbolism used on the Drawings for electrical work or the languages used in the Specifications for electrical work shall be interpreted as a reason for omitting accessories necessary to complete any required system or item of equipment.

L. The use of words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.

M. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material shall be the product of one manufacturer throughout. Multiple manufacturers will not be permitted.

1.2 COORDINATION OF THE WORK

A. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.

B. Carefully check space requirements with other trades and the physical confines of the area to ensure that all material can be installed in the spaces allotted thereto including finished suspended ceilings. Make modifications thereto as required and approved.

C. Transmit to other trades all information required for work to be provided under their respective sections in ample time for installation.

D. Wherever work interconnects with work of other trades, coordinate with other trades to ensure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the ceiling trade will know where to install access doors and panels.

E. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.

F. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations approved by the Engineer before proceeding with the installation.

G. The Drawings show only the general run of raceways and approximate location of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Engineer and shall receive approval before such alterations are made. All such modifications shall be made without additional cost to the Owner.

H. Obtain from the Engineer in the field the location of such outlets or equipment not definitively located on the Drawings.

I. Circuit "tags" in the form of arrows are used where shown to indicate the home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Show the actual circuit numbers on the finished record tracing and on panel directory card. Where circuiting is not indicated, the Electrical Contractor must provide required circuiting in accordance with the loading indicated on the drawings and/or as directed.

J. The Drawings generally do not indicate the exact number wires in each conduit for the branch circuit wiring of fixtures, and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated and control wiring diagrams, if any, specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.

K. Adjust locations of conduits, panels, equipment, pull boxes, fixtures, etc. to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each raceway prior to installation.

1. Right of way: lines which pitch to have the right-of-way over those which do not pitch. For example: steam, condensate, and plumbing drains normally have right-of-way. Lines whose elevations cannot be changed to have right-of-way over lines whose elevations can be changed.
2. Make offsets, transitions and changes in direction in raceways and as required to maintain proper head room in pitch of sloping lines whether or not indicated on the Drawings.

L. Contractor shall furnish services of experienced Superintendent, who shall be in constant charge of all work, and who shall coordinate his work with the work of other trades. No work shall be installed before coordinating with other trades.

1.3 EXAMINATION OF SITE

A. Prior to submitting of bids, the Contractor shall visit the site of the job and shall familiarize himself with all conditions affecting the proposed installation and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph will in no way relieve the Contractor of performing all necessary work shown on the Drawings.

1.4 PROGRESS OF WORK

A. The Contractor shall order the progress of his work so as to conform to the progress of the work of other trades and shall complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from the defective or ill-timed work performed under this section shall be borne by the Contractor.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair. Any such repairs shall be subject to review and acceptance of the Engineer.

B. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container fully identified with manufacturer's name, trade name, type, class, grade, size and color.

C. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection by the Engineer until installed. Store all items subject to moisture damage in dry, heated spaces.

1.6 EQUIPMENT ACCESSORIES

A. Provide supports, hangers and auxiliary structural members required for support of the work.

B. Furnish and set all sleeves for passage of raceways through structural, masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each raceway and passing through building surfaces.

C. Wall mounted equipment, total weight of 100 pounds or less, may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment, with total weight of more than 100 pounds, shall be mounted on adequately free standing sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Globe-Strutt and Unistrut, may be used for mounting arrays of equipment.

1.7 CUTTING, PATCHING, ETC.

A. The work shall be carefully laid out in advance. Where Cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work shall be carefully done. Any damage to the building, piping, equipment or defaced finish plaster, woodwork, metalwork, etc. shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner.

B. The Contractor shall do no cutting, channeling, chasing or drilling of unfinished masonry, tile, etc., unless he first obtains permission from the Engineer. If permission is granted, the Contractor shall perform this work in a manner approved by the Engineer.

C. Where conduits, outlet, junction, or pullboxes are mounted on a painted surface, or a surface to be painted, they shall be painted to match the surface. Whenever support channels are cut, the bare metal shall be cold galvanized.

D. Slots, chases, openings and recesses through floors, walls, ceilings, and roofs will be provided by the various trades in their respective materials. The trade requiring them to properly locate such openings and be responsible for any cutting and patching caused by the neglect to do so.

1.8 MOUNTING HEIGHTS

A. Unless otherwise noted, mounting heights for equipment and wiring devices shall be as shown as noted on the drawings.

1.9 CLEANING UP

A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc. resulting from the installation of work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Architect's instructions, which shall be promptly carried out.

B. Contractor shall clean all fixtures and equipment at the completion of the project.

1.10 PRODUCTS

A. If products and materials are specified or indicated on the drawings for a specific item or system, use those products or materials. Where noted in other sections of this specification, equipment has been specified for a specific performance and substitutions are not permitted. If products and materials are not listed in either of the above, use first class products and materials, subject to approval of Shop Drawings where Shop Drawings are required or as approved in writing where Shop Drawings are not required.

1.11 OMISSIONS FROM THE DRAWINGS

A. Should a Bidder find discrepancies in or omissions from the drawings or specifications or be in doubt as to their meaning, he shall notify the Architect before submitting his proposal. The Architect will in turn, send written instructions to all Bidders. Neither the Architect nor the Owner will be responsible for oral instructions. If the Contractor fails to comply with this requirement, he shall accept the Engineer's interpretations as to the intended meaning of the drawings and specifications.

1.12 EXECUTION

A. Follow manufacturer's instructions for installing, connecting, and adjusting all equipment. Provide one copy of such instructions to the Architect before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special supports, connections, wiring, accessories, etc.

B. Use mechanics skilled in their trade for all work.

C. Clean all items before and after installation. Clean up all debris.

D. Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

E. Applicable equipment and materials to be listed by Underwriters' Laboratories and manufactured in accordance with ASME, NEMA, ANSI or IEEE standards and as approved by local authorities having jurisdiction.

F. Before commencing work, examine all adjoining, underlying, etc., work on which this work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

1.13 VERIFICATION OF ELECTRICAL REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS

A. Prior to the installation of wiring systems for any equipment furnished by others, this contractor shall verify that the electrical requirements of the equipment match those shown on the electrical drawings by examining the approved shop drawings of that equipment. Any discrepancies shall be immediately reported to the engineer.

B. If the contractor fails to comply with this requirement, he shall be responsible for any additional costs incurred at no additional cost to the Owner.

1.14 PROTECTION OF BUILDING FIRE/SMOKE BARRIERS

A. Passages of conduit through fire barriers and/or smoke barriers shall be protected as follows:

1. The space between the penetrating item and the fire barrier and/or smoke barrier shall be filled with a material capable of maintaining the fire/smoke resistance of the barrier or be protected by an approved device designed for the specific purpose.
2. Where the penetrating item uses a sleeve to penetrate the fire and/or smoke barrier the sleeve shall be solidly set in the fire/smoke barrier and the space between the item and the sleeve shall be filled as described above.
3. Fire barriers shall include 1-hour, 2-hour, and 3-hour rated floors and walls. Refer to architectural plans for location of fire barriers and smoke barriers and provide protection required to maintain ratings in accordance with all codes.
4. Approved fill material for fire barriers shall be packed mineral wool, with ASTME-136 rating and 3M Fire Barrier caulk. Coordinate sealing of all openings with requirements of Division 7 of this specification.
5. Perform work in accordance with the appropriate UL Ratings.
6. Product Data: Provide manufacturer's specifications, recommendations and installation instructions for each application.

1.15 CODES AND FEES

A. General: Comply with Codes in accordance with the Contract Documents.

B. The electrical installation shall be in compliance with the requirements of OSHA, NEC and the rules, regulations and requirements of the power company supplying power to the building.

C. The electrical installation shall comply fully with all township, county and state laws, ordinances and regulations applicable with electrical installations.

D. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE and UL.

E. Should any change in Drawings or Specifications be required to comply with governmental regulations, the Contractor shall notify Architects prior to execution of the work. The work shall be carried out according to the requirements of such code in accordance with the instruction of the Architect and at no additional cost to the Owner.

F. The local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local utility companies with respect to their services.

G. Certificate of Inspection and approval shall be procured and paid for by this Contractor from an approved certified inspection agency.

1.16 GUARANTEE

A. General: Provide a Guarantee in accordance with the Contract Documents.

B. Submit a single guarantee stating that all portions of the work are in accordance with Contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one (1) year from date of final acceptance by the Owner, except that where guarantees or warranties for longer terms are specified herein, such longer term to apply. Within 24 hours after notification, correct any deficiencies which occur during the guarantee period at no additional cost to Owner, all to the satisfaction of the Owner and Architect. Obtain similar guarantees from subcontractors, manufacturers, suppliers and subtrade specialists.

1.17 DISPOSAL

A. All electrical items not designated by the Owner for his use to be properly disposed of according to local, state and Federal regulations.

B. Items containing polychlorinated biphenyl (PCB) to be removed, transported and disposed of according to Federal Toxic Substances Control Act (TSCA). Contractor to submit certification that these items have been properly disposed.

END OF SECTION 260500

SECTION 260519

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. General: Provide 600 volt wire and cable in accordance with the Contract Documents.

1.3 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Underwriters Laboratory Standard No. UL 467
   a. ASTM
   b. IPECA
2. Terminal Blocks
   a. UL-1059

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

A. General

1. Provide wire with a minimum insulating rating of 600 volts, except for wire used in 50 volts or below applications for control of signal systems use 300 volt minimum or 600 volt where permitted to be incorporated with other wiring systems.

B. Conductor

1. Electrical grade, annealed copper fabricated in accordance with ASTM standards. Minimum size number 12 for branch circuits; number 14 for control wiring.
2. The conductors shown on the drawings are copper, except as noted otherwise.

C. Stranding and Number of Conductors

1. Number 12 and number 10 solid.
2. Cables larger than number 10, stranded in accordance with ASTM Class B stranding designations.
3. Control wires stranded in accordance with ASTM Class B stranding designations.
4. Cables, multi-conductor unless otherwise noted for low tension systems.

D. Insulation

1. Type THWN/THHN insulation suitable for use in wet locations up to 75 degrees Centigrade. Use for lighting, receptacle and motor circuits and for panel and equipment feeders.

2.2 CONNECTORS

A. Make connections, splices, taps and joints with solderless devices, mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide not less than that of the conductor.

B. Branch Circuit wires (Number 10 and smaller): Use any of the following types of terminals and connecting devices:

1. Hand Applied
   a. Coiled tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by hand.
2. Tool Applied
   a. Steel cap, with conduction and corrosion resistant metallic plating, open at both ends, fitted around the twisted ends of the wire and compressed or crimped by means of a special die designed for the purpose. Specifically fitted plastic or rubber insulating cover wrap over each connector.

2.3 ELECTRICAL TAPE

A. Specifically designed for use as insulating tape.

2.4 LUBRICANT

A. Use lubricant only where the possibility of damage to conductors exists. Use only a lubricant approved by the cable manufacturer and one which is inert to cable and raceways.

PART 3 - EXECUTION

3.1 WIRE AND CABLE

A. Provide a complete system of conductors in raceway system. Mount wiring through a specified raceway, regardless of voltage application.

B. Drawings do not indicate size of branch circuit wiring. For branch circuits whose length from panel to furthest outlet exceeds 100 feet for 120-volt circuits, use number 10 or larger.

C. Do not install wire in incomplete conduit runs nor until after the concrete work and plastering is completed and moisture is swabbed from conduits. Eliminate splices wherever possible. Where necessary, splice in readily accessible pull, junction, or outlet.

D. Provide cable supports for all vertical risers where required by code.

E. Use terminating fittings, connectors, etc., of a type suitable for the specified cable furnished. Make bends in cable at termination prior to installing compression device. Make fittings tight.

F. Extend wire sizing for the entire length of a circuit, feeder, etc. unless specifically noted otherwise.

G. Provide a separate neutral conductor for each branch circuit. In the event a common neutral conductor is used, such as in furniture systems, the circuit breaker in the panelboard must be common trip for each phase that uses one neutral conductor.

END OF SECTION 260519

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Equipment shall be installed on hangers and supports as specified in this section of the specifications.

1.3 SUPPORTS

A. Support work in accordance with the best industry practice and the following.

B. Include supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets.

C. Nothing, (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported from heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fitting on two opposite sides.

D. Nothing shall rest on, or depend for support on, suspended ceilings media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling).

E. Provide required supports and hangers for conduit, equipment, etc., so that loading will not exceed allowable loadings of structure.

1.4 FASTENINGS

A. Fasten electric work to building structure in accordance with the best industry practice and the following:

B. As a minimum procedure, where weight applied to the attachment points is 100 pounds or less, fasten to building elements of:

1. Wood – with wood screws.
2. Concrete and solid masonry – with bolts and expansion shields.
3. Hollow Construction – with toggle bolts.
4. Solid metal – with machine screws in tapped holes or with welded studs.
5. Steel decking or subfloor – with fastenings as specified below for applied weights in excess of 100 pounds.

END OF SECTION 260529

SECTION 260533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide raceways in accordance with the Contract Documents.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
   1. Electrical Metallic Tubing – EMT
      a. UL Standard UL-797
      b. ANSI C80-3
      c. Federal Specification WW-C-563
   2. Flexible Metal Conduit – FMC
      a. UL Standard UL-1
   3. Metal Clad Cable – MC
      a. UL Standard 1581
      b. Federal Spec J-C-30B

PART 2 - PRODUCTS

2.1 RACEWAY TYPES

A. Electric Metallic Tubing – EMT

   1. Continuous, seamless tubing galvanized or sheradized on the exterior coated on the interior with a smooth hard finish of lacquer, varnish or enamel.
   2. All couplings, connectors, etc., used in conjunction with this raceway which are 2 inch in size and smaller shall be watertight compression type. EMT fittings shall be malleable iron zinc coated. With conduits of 2-1/2 inch in size and larger, set screw type couplings are permitted.

B. Flexible Metal Conduit – FMC

   1. Single strip, continuous, flexible interlocked double-wrapped steel, galvanized inside and outside forming smooth internal wiring channel.
   2. Maximum length: 6 feet.
   3. Each section of raceway must contain a bonding wire bonded at each end and sized as required. Provide connectors with insulating bushings.

C. Metal Clad Cable – MC

Non Health Care

1. Type MC cable shall be armored galvanized steel sheath cable with copper conductors and THHN 90 º insulation. Furnish with insulated grounding conductor.

2.2 OUTLET, JUNCTION AND PULLBOXES

A. Provide zinc-coated or cadmium-plated sheet steel outlet boxes not less than 4 inches octagonal or square, unless otherwise noted. Equip fixture outlet boxes with 3/8 inch no-bolt fixture studs where required. Where fixtures are mounted on or in an accessible type ceiling, provide a junction box and extend flexible conduit to each fixture. Fit outlet boxes in finished ceilings or walls with appropriate covers, set flush with the finished surface. Where more than one switch or device is located at one point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes will not be permitted. Provide Series "GW" (Steel City) tile box, or as accepted, or a 4 inch square box with tile ring in masonry walls which will not be plastered or furred. Where drywall material is utilized, provide plaster ring. Provide outlet boxes of the type and size suitable for the specific application. Where outlet boxes contain two or more 277 volt devices, or where devices occur of different applied voltages, or where normal and emergency devices occur in same box, provide suitable barrier.

B. Construct junction or pullboxes not over 150 cubic inches in size as standard outlet boxes, and those over 150 cubic inches the same as "cabinets" with screw covers of the same gauge metal.

C. Plug any open knockouts not utilized.

D. Provide surface mounted outlet and junction boxes in indoor locations where exposed to moisture and outdoor locations of cast metal with threaded hubs.

PART 3 - EXECUTION

3.1 APPLICATION OF RACEWAYS

A. The following applications must be adhered to except as otherwise required by Code. Raceway not conforming to this listing must be removed by this Contractor and replaced with the specified material at this Contractor's expense.

B.

Raceway Types	Application
Electrical Metallic Tubing EMT	Use in every instance except where another material is specified.
Flexible Metal Conduit – FMC	Use in dry areas for connections to lighting fixtures in hung ceilings, connections to equipment installed in removable panels of hung ceilings at all transformer or equipment raceway connections where sound and vibration isolation is required.

Metal-Clad Cable - MC	Use for branch circuit wiring above suspended ceilings or in metal stud walls. Cable shall not be run exposed. Home run wiring from panelboard to first outlet box shall be installed in conduit. MC cable not permitted for fire alarm wiring systems or emergency lighting.

3.2 RACEWAY SYSTEMS IN GENERAL

A. Provide raceways for all wiring systems unless noted otherwise. Minimum size 3/4 inch for home runs and 1 inch minimum for power distribution. Wiring of each type and system must be installed in separate raceways.

B. Locate raceways so that the strength of structural members is unaffected and they do not conflict with the services of other trades. Install 1 inch or larger raceways in or through structural members (beams, slabs, etc.) only when and in the manner accepted by the Architect. Draw up couplings and fittings full and tight. Protect threads from corrosion with one coat zinc chromate after installation.

C. Above Grade – Defined as the area above finished grade for a building exterior and above top surface of any slabs (or other concrete work) on grade for a building interior. Above-grade raceways to comply with the following:

1. Install raceways concealed except at surface cabinets and for motor and equipment connection in electrical and mechanical rooms. Install a minimum of 6 inches from flues, steam pipes, or other heated lines. Route raceways parallel or perpendicular to building lines with right-angle turns and symmetrical bends. Run embedded raceways in a direct line and, where possible, with long sweep bends and offsets. Provide sleeves in forms for new concrete walls, floor slabs and partitions for passage of raceways. Waterproof sleeved raceways where required.
2. Provide raceway expansion joints for exposed and concealed raceways with necessary bonding conductor at building expansion joints and between buildings or structures and where required to compensate for raceway or building thermal expansion and contraction.

D. Raceways in hung ceilings shall be run on and secured to slab or primary structural members of ceiling, not to lathing channels or T-bars or other elements which are the direct supports of the ceiling panels. Secure conduit firmly to steel by clips and fittings designed for that purpose. Install as high as possible, but not less than, 1-0" above hung ceilings.

E. Exposed raceways shall be run parallel or at right angles with building lines. Secure raceway clamps or supports to masonry materials by toggle bolts, expansion bolts, or steel inserts. Install raceway on steel construction with approved clamps which do not depend on friction or set-screw pressure alone.

F. Clear raceway of all obstructions and dirt prior to pulling in wires or cables. This shall be done with ball mandrel (diameter approximately 85% of conduit inside diameter) followed by close fitting wire brush and wad of felt or similar material. This assembly may be pulled in together with, but ahead of the cable being installed. All empty raceways shall be similarly cleaned. Clear any raceway which rejects ball mandrel.

G. Support less than 1 inch trade size horizontally run, raceways at intervals not greater than 7 feet. Support such raceways, 1 inch trade size or larger, at intervals no greater than 10 feet.

3.3 OUTLET, JUNCTION, AND PULLBOXES

A. Provide outlet, junction, and pullboxes as indicated on the Drawings and as required for the complete installation of the various electrical systems, and to facilitate proper pulling of wires and cables. J-boxes and pullboxes shall be sized per NEC minimum.

B. The exact location of outlets and equipment is governed by structural conditions and obstructions or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to the room layout and will not interfere with other work or equipment. Verify final location of outlets, panels equipment, etc., with Architect.

C. Back-to-back outlets in the same wall or "thru-wall" type boxes are not permitted. Provide 12 inch (minimum) spacing for outlets shown on opposite sides of a common wall to minimize sound transmission.

END OF SECTION 260533

SECTION 265100

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes, but is not necessarily limited to, the furnishing and installation of all lighting as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the work.

B. Major items:

1. Interior lighting fixtures
2. Emergency lighting
3. Exit lighting
4. Adequate fixture support systems.

1.2 STANDARDS

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. NFPA
   a. 70 – NEC
   b. 101 – Life Safety

1.3 FIXTURE SCHEDULE

A. No substitutions will be accepted after bids are received. The lighting equipment specified herein has been carefully chosen for its ability to meet luminous performance requirements of this project. Substitutions in all likelihood will be unable to meet all of the same criteria as specified equipment. No exceptions.

B. When only one manufacturer is listed within the description of the luminaire, the design engineering of architectural aesthetics will not allow substitution of another manufacturer. The contractor shall provide a separate list of unit costs for these luminaires with shop drawings. Shop drawings will not be reviewed without unit cost information.

C. When one or more manufacturers and the words "or equivalent" appear within the fixture description, the Contractor may elect to submit to Engineer a substitute fixture for review. All submittals must be made within 14 days prior to the bid date to provide ample time for review and to issue an addendum incorporating the substitution.

D. Substitution submittals shall consist of a physical description, dimensioned drawing and complete photometric and electric data of the proposed lamp and luminare. Working samples of lamp and luminaire substitutions must also be supplied for visual check of finish and operating characteristics. Photometric reports must list the actual candela values for the luminaire's distribution in at least three planes. Candela curves, footcandle and lumen tables and iso-footcandle contours are not acceptable. No substitutions will be considered without compliance with the paragraph. Contractor will be responsible for all cost, (engineering time, manufacturer's costs, distributor costs) incurred to replace equipment not approved if substitutions are made by the distributor, manufacturers representative, or subcontractor.

E. Once Bids, Shop Drawings are approved, all lighting is to be ordered in a timely manner. The Contractor is then to inform the Engineer immediately, in writing, the date when equipment orders are completed and delivery scheduled.

1.4 SUBMITTALS

A. Submit shop drawings and manufacturers' data for the following items in accordance with the conditions of the contract and as specified below.

1. Major luminaires and special luminaires shall show full size cross sections. Indicate finished dimensions, metal thicknesses, and materials.
2. Show mounting details, including hung ceiling construction.
3. Shop drawings shall include a complete listing of all luminaires on a single sheet. This listing shall contain the luminaire type, manufacturer's catalog number, applied voltage, lamps and ballasts.
4. Submit manufacturer's fixtures and accessories Shop Drawings and data in booklet form, including rough-in dimensions, instructions for installation and maintenance.

1.5 PROTECTION

A. Protect lighting fixtures and work against dirt, water or mechanical damage before, during, and after installation. Damage to fixtures prior to final acceptance shall be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS AND FIXTURES

A. General

1. Provide all lighting fixtures in accordance with Lighting Fixture Schedule and as indicated and required on Drawings.
2. Fixture catalog numbers only indicates type and style. Provide each fixture complete with proper fixture trim, levelers, mounting brackets, flanges, plaster rings, glassware and accessories for complete installation as required for type of ceiling and room finish schedules.

3. Provide gaskets as required to prevent light spill between frames and ceilings.
4. Provide continuity of ground on all fixtures used as raceways and mounted end to end.
5. All metal parts to be chemically treated with a rust resistant phosphatized solution, reflecting surfaces to have a factor of minimum 90%.
6. Provide luminaires, completely factory-assembled and wired and equipped with necessary sockets, ballasts, wiring, shielding, reflectors, channels, lenses, etc., and deliver to job ready for installation.
7. Luminaire Wiring: Minimum individual luminaire wiring – number 18 gauge with insulation with rated operating temperature of 105 degrees Centigrade or higher. Terminate wiring for recessed luminaires, except fluorescent units, in an external splice box.
8. Recessed luminaires shall be furnished with thermal protection in accordance with Article 410-65 of the NEC.
9. Where utilized as raceway, luminaires shall be suitable for use as raceways. Provide feed through splice boxes where necessary. Wiring shall be rated for 90 degrees Centigrade.

B. Exit Lighting

1. Exit lighting system shall be as indicated on Drawings.
2. Equipment shall be complete with lamps.
3. Where indicated as such, provide battery pack and charger for illumination under power failure conditions.
4. Equipment shall meet BOCA, OSHA, NFPA and NEC illumination standards.

2.2 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel and angle-iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. General
1. Install outlets, surface mounted, recessed or semi-recessed fixtures to maintain the alignment, spacings, layout and general arrangements indicated in the Drawings. Obtain approval of Engineer for all changes in layout required to avoid interferences with other trades.

B. Coordination

1. Work incorporating with ceiling trades in locating and framing recessed fixtures in acoustical tile pattern or grid system to conform to layout.
2. Inform affected trades of the location and framing details necessary for the installation of flush fixtures and deliver all framing rings of these fixtures that become a part of the ceiling construction.

3. Before equipment is ordered, electrical contractor to review luminaire and ceiling mechanical compatibility in each area and verify luminaire on the drawings. Contractor shall be responsible for all fixture quantities, lengths and clearances required and shall inform the ARCHITECT of the job conditions at variance with the fixture(s) specified or detailed which affect installation or location. (All stages of installation.)
4. Mechanical and electrical contractors are to review and coordinate lighting locations in relationship to mechanical systems to minimize conflicts prior to installation. Electrical contractor is to submit a written memo with minutes of these meetings to both the Architect and Engineer.
5. This contractor is responsible for coordinating the characteristics and the U.L. labeling of the luminaires and their components with the ambient conditions, which will exist when the luminaires are installed. No extra compensation will be permitted for failure to coordinate the luminaires with their ambient conditions.

C. Mounting and Supports
1. Where luminaires are mounted on surface-mounted outlet boxes in surface mounted conduit runs, this Contractor shall furnish and install a luminaire canopy sufficiently deep to permit exposed conduits to pass through. Canopy shall have proper openings cut by luminaire manufacturer through which conduits may pass. Submit sample of canopy for approval before installation.
2. Prior to final payment, this contractor shall clean all luminaires and replace all lamps. He shall also touch up all scratch marks, etc. in an approved manner.
3. Recessed luminaires to be installed in metal panel or acoustic modular ceilings shall be modified as required to fit into openings in ceiling construction. This contractor shall coordinate and verify this work with the General Construction Contractor. Shop Drawings showing details shall be submitted for approval.
4. All luminaires in hung ceilings are to be installed with earthquake clips.

3.2 ADJUSTING AND CLEANING

A. At project completion, before final approval:

1. Aim adjustable fixtures as directed and observe and adjust at night as required.
2. Clean interior of all fixtures, all lenses and lamps.

END OF SECTION 265100

SECTION 281300

ACCESS CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes a security access system consisting of field-installed Controllers connected by a high-speed electronic data transmission network. The security access system shall have the following:

1. Access Control:

a. Regulating access through doors.
b. Anti-passback.
c. Visitor assignment.
d. Credential cards and readers.
e. Monitoring of field-installed devices.
f. Reporting.

1.2 SYSTEM DESCRIPTION

A. System shall consist of connections to existing Central Station, and field-installed Controllers, connected by a high-speed electronic data transmission network.

B. Network(s) connecting PCs and Controllers shall consist of one or more of the following:

1. Local area, IEEE 802.3 Fast Ethernet 10 BASE-T star topology network based on TCP/IP.

C. System Network Requirements:

1. Interconnect system components and provide automatic communication of status changes, commands, field-initiated interrupts, and other communications required for proper system operation.
2. Communication shall not require operator initiation or response, and shall return to normal after partial or total network interruption such as power loss or transient upset.
3. System shall automatically annunciate communication failures to the operator and identify the communication link that has experienced a partial or total failure.
4. Communications Controller may be used as an interface between the Central Station display systems and the field device network. Communications Controller shall provide functions required to attain the specified network communications performance.

D. Field equipment shall include Controllers, sensors, and controls. Controllers shall serve as an interface between the Central Station and sensors and controls. Data exchange between the Central Station and the Controllers shall include down-line transmission of commands,

software, and databases to Controllers. The up-line data exchange from the Controller to the Central Station shall include status data such as intrusion alarms, status reports, and entry-control records. Controllers are classified as alarm-annunciation or entry-control type.

E. Error Detection: A cyclic code error detection method shall be used between Controllers and the existing Central Station, which shall detect single- and double-bit errors, burst errors of eight bits or less, and at least 99 percent of all other multibit and burst error conditions. Interactive or product error detection codes alone will not be acceptable.

F. Door Hardware Interface: Coordinate with Division 08 Sections that specify door hardware required to be monitored or controlled by the security access system. The Controllers in this Section shall have electrical characteristics that match the signal and power requirements of door hardware. Integrate door hardware specified in Division 08 Sections to function with the controls and PC-based software and hardware in this Section.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include operating characteristics, furnished specialties, and accessories. Reference each product to a location on Drawings. Test and evaluation data presented in Product Data shall comply with SIA BIO-01.

B. Shop Drawings:

1. Diagrams for cable management system.
2. System labeling schedules, including electronic copy of labeling schedules that are part of the cable and asset identification system of the software specified in Parts 2 and 3.
3. Wiring Diagrams. Show typical wiring schematics including the following:

    a. Outlets, jacks, and jack assemblies.

C. Project planning documents as specified in Part 3.

D. Field quality-control test reports.

1. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70, "National Electrical Code."

C. Comply with SIA DC-01 and SIA DC-03.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with existing system requirements and manufacturer.

B. Controller Software:

1. Controllers shall operate as an autonomous intelligent processing unit. Controllers shall make decisions about access control, alarm monitoring, linking functions, and door locking schedules for its operation, independent of other system components. Controllers shall be part of a fully distributed processing control network. The portion of the database associated with a Controller and consisting of parameters, constraints, and the latest value or status of points connected to that Controller, shall be maintained in the Controller.
2. Functions: The following functions shall be fully implemented and operational within each Controller:

    a. Monitoring inputs.
    b. Controlling outputs.
    c. Automatically reporting alarms to the existing Central Station.
    d. Reporting of sensor and output status to existing Central Station on request.
    e. Maintaining real time, automatically updated by the existing Central Station at least once a day.
    f. Communicating with the existing Central Station.
    g. Executing Controller resident programs.
    h. Diagnosing.
    i. Downloading and uploading data to and from the existing Central Station.

3. Controller Operations at a Location:

    a. Location: Up to 64 Controllers connected to RS-485 communications loop. Globally operating I/O linking and anti-passback functions between Controllers within the same Location without central-station intervention. Linking and anti-passback shall remain fully functional within the same Location even when the Central Station is off line.
    b. In the event of communications failure between the Central Station and a Location, there shall be no degradation in operations at the Controllers at that Location. The Controllers at each Location shall be connected to a memory buffer with a capacity to store up to 10,000 events; there shall be no loss of transactions in system history files until the buffer overflows.
    c. Buffered events shall be handled in a first-in-first-out mode of operation.

4. Individual Controller Operation:

    a. Controllers shall transmit alarms, status changes, and other data to the Central Station when communications circuits are operable. If communications are not available, Controllers shall function in a stand-alone mode and operational data, including the status and alarm data normally transmitted to the Central Station,

shall be stored for later transmission to the Central Station. Storage capacity for the latest 1024 events shall be provided at each Controller.

b. Card-reader ports of a Controller shall be custom configurable for at least 120 different card-reader or keypad formats. Multiple reader or keypad formats may be used simultaneously at different Controllers or within the same Controller.
c. Controllers shall provide a response to card-readers or keypad entries in less than 0.25 seconds, regardless of system size.
d. Controllers that are reset, or powered up from a nonpowered state, shall automatically request a parameter download and reboot to its proper working state. This shall happen without any operator intervention.
e. Initial Startup: When Controllers are brought on-line, database parameters shall be automatically downloaded to them. After initial download is completed, only database changes shall be downloaded to each Controller.
f. Failure Mode: On failure for any reason, Controllers shall perform an orderly shutdown and force Controller outputs to a predetermined failure mode state, consistent with the failure modes shown and the associated control device.
g. Startup After Power Failure: After power is restored, startup software shall initiate self-test diagnostic routines, after which Controllers shall resume normal operation.
h. Startup After Controller Failure: On failure, if the database and application software are no longer resident, Controllers shall not restart, but shall remain in the failure mode until repaired. If database and application programs are resident, Controllers shall immediately resume operation. If not, software shall be restored automatically from the Central Station.

5. Communications Monitoring:

a. System shall monitor and report status of RS-485 communications loop of each Location.
b. Communication status window shall display which Controllers are currently communicating, a total count of missed polls since midnight, and which Controller last missed a poll.
c. Communication status window shall show the type of CPU, the type of I/O board, and the amount of RAM memory for each Controller.

6. Operating systems shall include a real-time clock function that maintains seconds, minutes, hours, day, date, and month. The real-time clock shall be automatically synchronized with the Central Station at least once a day to plus or minus 10 seconds. The time synchronization shall be automatic, without operator action and without requiring system shutdown.

C. PC-to-Controller Communications:

1. Central-station communications shall use the following:

a. Direct connection using serial ports of the PC.
b. TCP/IP LAN network interface cards.

2. Serial Port Configuration: Each serial port used for communications shall be individually configurable for "direct communications," "modem communications incoming and outgoing," or "modem communications incoming only"; or as an ASCII output port.

3. Multiport Communications Board: Use if more than two serial ports are needed.

    a. Expandable and modular design. Use a 4-, 8-, or 16-serial port configuration that is expandable to 32 or 64 serial ports.
    b. Connect the first board to an internal PCI bus adapter card.

4. Direct serial, TCP/IP, and dial-up communications shall be alike in the monitoring or control of system, except for the connection that must first be made to a dial-up Location.
5. TCP/IP network interface card shall have an option to set the poll frequency and message response time-out settings.
6. PC-to-Controller and Controller-to-Controller communications (direct, dial-up, or TCP/IP) shall use a polled-communication protocol that checks sum and acknowledges each message. All communications shall be verified and buffered and retransmitted if not acknowledged.

D. Controller-to-Controller Communications:

1. Controller-to-Controller Communications: RS-485, 4-wire, point-to-point, regenerative (repeater) communications network methodology.
2. RS-485 communications signal shall be regenerated at each Controller.

2.2 CONTROLLERS

A. Controllers: Intelligent peripheral control unit, complying with UL 294, that stores time, date, valid codes, access levels, and similar data downloaded from the existing Central Station for controlling its operation.

B. Subject to compliance with requirements in this Article, manufacturers may use multipurpose Controllers.

C. Entry-Control Controller:

1. Function: Provide local entry-control functions including one- and two-way communications with access-control devices such as card readers, biometric personal identity verification devices, door strikes, magnetic latches, and door operators.

    a. Operate as a stand-alone portal Controller using the downloaded database during periods of communication loss between the Controller and the field-device network.
    b. Accept information generated by the entry-control devices; automatically process this information to determine valid identification of the individual present at the portal:

        1) On authentication of the credentials or information presented, check privileges of the identified individual, allowing only those actions granted as privileges.
        2) Privileges shall include, but not be limited to, time of day control, day of week control, group control, and visitor escort control.

c. Maintain a date-, time-, and Location-stamped record of each transaction. A transaction is defined as any successful or unsuccessful attempt to gain access through a controlled portal by the presentation of credentials or other identifying information.

2. Inputs:

a. Data from entry-control devices; use this input to change modes between access and secure.
b. Database downloads and updates from the existing Central Station that include enrollment and privilege information.

3. Outputs:

a. Indicate success or failure of attempts to use entry-control devices and make comparisons of presented information with stored identification information.
b. Grant or deny entry by sending control signals to portal-control devices.
c. Maintain a date-, time-, and Location-stamped record of each transaction and transmit transaction records to the existing Central Station.
d. Door Prop Alarm: If a portal is held open for longer than 20 seconds, alarm sounds.

4. With power supplies sufficient to power at voltage and frequency required for field devices and portal-control devices.
5. Data Line Problems: For periods of loss of communications with Central Station, or when data transmission is degraded and generating continuous checksum errors, the Controller shall continue to control entry by accepting identifying information, making authentication decisions, checking privileges, and controlling portal-control devices.

a. Store up to 1000 transactions during periods of communication loss between the Controller and access-control devices for subsequent upload to the Central Station on restoration of communication.

6. Controller Power: NFPA 70, Class II power supply transformer, with 12- or 24-V ac secondary, backup battery and charger.

a. Backup Battery: Premium, valve-regulated, recombinant-sealed, lead-calcium battery; spill proof; with a full 1-year warranty and a pro rata 19-year warranty. With single-stage, constant-voltage-current, limited battery charger, comply with battery manufacturer's written instructions for battery terminal voltage and charging current recommendations for maximum battery life.
b. Backup Power Supply Capacity: 90 minutes of battery supply. Submit battery and charger calculations.
c. Power Monitoring: Provide manual dynamic battery load test, initiated and monitored at the control center; with automatic disconnection of the Controller when battery voltage drops below Controller limits. Report by using local Controller-mounted LEDs and by communicating status to Central Station. Indicate normal power on and battery charger on trickle charge. Indicate and report the following:

1) Trouble Alarm: Normal power off load assumed by battery.

2) Trouble Alarm: Low battery.
3) Alarm: Power off.

2.3 CARD READERS

A. Power: Card reader shall be powered from its associated Controller, including its standby power source.

B. Response Time: Card reader shall respond to passage requests by generating a signal that is sent to the Controller. Response time shall be 800 ms or less, from the time the card reader finishes reading the credential card until a response signal is generated.

C. Enclosure: Suitable for surface, semiflush, or pedestal mounting. Mounting types shall additionally be suitable for installation in the following locations:

1. Indoors, controlled environment.
2. Indoors, uncontrolled environment.
3. Outdoors, with built-in heaters or other cold-weather equipment to extend the operating temperature range as needed for operation at the site.

D. Display: LED or other type of visual indicator display shall provide visual status indications and user prompts. Indicate power on/off, whether user passage requests have been accepted or rejected, and whether the door is locked or unlocked.

E. Touch Plate and Proximity Readers:

1. Active detection proximity card readers shall provide power to compatible credential cards through magnetic induction, and shall receive and decode a unique identification code number transmitted from the credential card.
2. Passive detection proximity card readers shall use a swept-frequency, RF field generator to read the resonant frequencies of tuned circuits laminated into compatible credential cards. The resonant frequencies read shall constitute a unique identification code number.
3. The card reader shall read proximity cards in a range from contact with to at least 6 inches (150 mm) from the reader.

2.4 DOOR AND GATE HARDWARE INTERFACE

A. Exit Device with Alarm: Operation of the exit device shall generate an alarm and annunciate a local alarm. Exit device and alarm contacts are specified in Division 08 Section "Door Hardware."

B. Electric Door Strikes: Use end-of-line resistors to provide power line supervision. Signal switches shall transmit data to Controller to indicate when the bolt is not engaged and the strike mechanism is unlocked, and shall report a forced entry. Power and signal shall be from the Controller. Electric strikes are specified in Division 08 Section "Door Hardware."

C. Electromagnetic Locks: End-of-line resistors shall provide power line supervision. Lock status sensing signal shall positively indicate door is secure. Power and signal shall be from the Controller. Electromagnetic locks are specified in Division 08 Section "Door Hardware."

2.5 TRANSFORMERS

A. NFPA 70, Class II control transformers, NRTL listed. Transformers for security access-control system shall not be shared with any other system.

2.6 CABLE AND ASSET MANAGEMENT

A. Manufacturers:

1. IMAP Textron; Division of Greenlee Textron.
2. Total Wire Software Company, Inc.

B. Computer-based cable and asset management system, with fully integrated database and graphic capabilities, complying with requirements in TIA/EIA-606.

1. Document physical characteristics by recording the network, asset, user, TIA/EAI details, device configurations, and exact connections between equipment and cabling.

a. Manage the physical layer of security system.
b. List device configurations.
c. List and display circuit connections.
d. Record firestopping data.
e. Record grounding and bonding connections and test data.

2. Information shall be presented in database view, schematic plans, or technical drawings.

a. Microsoft Visio Technical Drawing shall be used as drawing and schematic plans software. Drawing symbols, system layout, and design shall comply with SIA AG-01.

3. System shall interface with the following testing and recording devices:

a. Direct upload tests from circuit testing instrument into the PC.
b. Direct download circuit labeling into labeling printer.

C. Software shall be designed for Microsoft Windows of same version as security access system's Central Station shall be installed on the designated PC, using a hard drive dedicated only to this management function. Hard-drive capacity shall be not less than [50] <Insert number> GB.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in SIA CP-01.

B. Comply with EIA/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings."

C. Obtain detailed Project planning forms from manufacturer of access-control system; develop custom forms to suit Project. Fill in all data available from Project plans and specifications and publish as Project planning documents for review and approval.

1. Record setup data for control station.
2. For each Location, record setup of Controller features and access requirements.
3. Propose start and stop times for time zones and holidays, and match up access levels for doors.
4. Set up groups, facility codes, linking, and list inputs and outputs for each Controller.
5. Assign action message names and compose messages.
6. Set up alarms. Establish interlocks between alarms, intruder detection, and video surveillance features.
7. Prepare and install alarm graphic maps.
8. Develop user-defined fields.
9. Develop screen layout formats.
10. Propose setups for guard tours and key control.
11. Discuss badge layout options; design badges.
12. Complete system diagnostics and operation verification.
13. Prepare a specific plan for system testing, startup, and demonstration.
14. Develop acceptance test concept and, on approval, develop specifics of the test.
15. Develop cable and asset management system details; input data from construction documents. Include system schematics and Visio Technical Drawings.

D. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final setup documents. Use final documents to set up system software.

3.2 CABLING

A. Comply with NECA 1, "Good Workmanship in Electrical Contracting."

B. Install cables and wiring according to requirements in Division 28 Section "Conductors and Cables for Electronic Safety and Security."

C. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

D. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.

E. Install LAN cables using techniques, practices, and methods that are consistent with Category 5E rating of components and that ensure Category 5E performance of completed and linked signal paths, end to end.

F. Install cables without damaging conductors, shield, or jacket.

G. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

H. Install end-of-line resistors at the field device location and not at the Controller or panel location.

3.3 CABLE APPLICATION

A. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."

B. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.

C. RS-485 Cabling: Install at a maximum distance of 4000 feet (1220 m).

D. Card Readers and Keypads:

1. Install number of conductor pairs recommended by manufacturer for the functions specified.
2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from Controller to the reader is 250 feet (75 m), and install No. 20 AWG wire if maximum distance is 500 feet (150 m).
3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the Controller.
4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

E. Install minimum No. 16 AWG cable from Controller to electrically powered locks. Do not exceed 250 feet (75 m).

F. Install minimum No. 18 AWG ac power wire from transformer to Controller, with a maximum distance of 25 feet (8 m).

3.4 GROUNDING

A. Comply with Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."

C. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

D. Bond shields and drain conductors to ground at only one point in each circuit.

E. Signal Ground:

1. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
2. Bus: Mount on wall of main equipment room with standoff insulators.
3. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.

3.5 INSTALLATION

A. Push Buttons: Where multiple push buttons are housed within a single switch enclosure, they shall be stacked vertically with each push-button switch labeled with 1/4-inch- (6.4-mm-) high text and symbols as required. Push-button switches shall be connected to the Controller associated with the portal to which they are applied, and shall operate the appropriate electric strike, electric bolt, or other facility release device.

B. Install card, fob, and biometric readers.

3.6 IDENTIFICATION

A. In addition to requirements in this Article, comply with applicable requirements in Division 26 Section "Identification for Electrical Systems" and with TIA/EIA-606.

B. Using cable and asset management software specified in Part 2, develop Cable Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable and jacks, connectors, and terminals to which it connects with same designation. Use logical and systematic designations for facility's architectural arrangement.

C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

1. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the particular device as shown.
2. Each wire connected to building-mounted devices is not required to be numbered at the device if the color of the wire is consistent with the associated wire connected and numbered within the panel or cabinet.

D. At completion, cable and asset management software shall reflect as-built conditions.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 5 tester. Test for faulty

connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.

2. Test each circuit and component of each system. Tests shall include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

3.8 STARTUP SERVICE

A. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in " Preparation" Article and with manufacturer's written instructions.

1. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.9 PROTECTION

A. Maintain strict security during the installation of equipment and software. Room housing the control station that has been powered up shall be locked and secured, with an activated burglar alarm and access-control system reporting to a Central Station complying with UL 1610, "Central-Station Burglar-Alarm Units," during periods when a qualified operator in the employ of Contractor is not present.

END OF SECTION 281300

SECTION 282300

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes video surveillance system consisting of cameras, data transmission wiring, and a control station with its associated equipment.

B. Video surveillance system shall be integrated with monitoring and control system specified in Division 28 Section "Access Control" that specifies systems integration.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, including dimensions and data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.

1. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
2. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
3. UPS: Sizing calculations.
4. Wiring Diagrams: Power, signal, and control wiring, and grounding.

C. Equipment List: Include every piece of equipment by model number, manufacturer, serial number, location, and date of original installation.

1. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
2. Detailed description of equipment anchorage devices on which the certification is based.

D. Field quality-control test reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NECA 1.

C. Comply with NFPA 70.

D. Electronic data exchange between video surveillance systems with an access control system shall comply with SIA TVAC.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Interior, Controlled Environment: System components, except central-station control unit, installed in temperature-controlled interior environments shall be rated for continuous operation in ambient temperatures of [**36 to 122 deg F (2 to 50 deg C)**] dry bulb and 20 to 90 percent relative humidity, noncondensing. NEMA 250, Type 1 enclosures.
2. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with existing system requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the existing manufacturers specified.

2.2 SYSTEM REQUIREMENTS

A. Video signal format shall comply with the NTSC standard composite video, interlaced. Composite video signal termination shall be 75 ohms.

B. Surge Protection: Protect components from voltage surges entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
1. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with manufacturer's recommendation for type of line being protected.

2.3 STANDARD CAMERAS

A. Manufacturers: subject to compliance to existing system.

B. Color Camera:

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 771(H) by 492(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions.
7. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
8. Manually selectable modes for backlight compensation or normal lighting.
9. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
10. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
11. Motion Detector: Built-in digital.

C. Automatic Color Dome Camera: Assembled and tested as a manufactured unit, containing a dome assembly, color camera, motorized pan and tilt, zoom lens, and receiver/driver.

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 768(H) by 494(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
7. Manually selectable modes for backlight compensation or normal lighting.
8. Pan and Tilt: Direct-drive motor, 360-degree rotation angle, and 180-degree tilt angle. Pan-and-tilt speed shall be variable controlled by operator. Movement from preset positions shall be not less than 300 degrees per second.
9. Preset Positioning: 8 user-definable scenes, each allowing 16-character titles. Controls shall include the following:

    a. In "sequence mode," camera shall continuously sequence through preset positions, with dwell time and sequencing under operator control.
    b. Motion detection shall be available at each camera position.
    c. Up to four preset positions may be selected to be activated by an alarm. Each of the alarm positions may be programmed to output a response signal.

10. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
11. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
12. Motion Detector: Built-in digital.

13. Dome shall support multiplexed control communications using coaxial cable recommended by manufacturer.

2.4 LENSES

A. Manufacturers: Subject to compliance of existing system.

B. Description: Optical-quality coated optics, designed specifically for video surveillance applications, and matched to specified camera. Provide color-corrected lenses.

1. Auto-Iris Lens: Electrically controlled iris with circuit set to maintain a constant video level in varying lighting conditions.
2. Fixed Lenses: With calibrated focus ring.
3. Zoom Lenses: Motorized, remote-controlled units, rated as "quiet operating." Features include the following:

    a. Electrical Leads: Filtered to minimize video signal interference.
    b. Motor Speed: Variable.
    c. Lens shall be available with preset positioning capability to recall the position of specific scenes.

2.5 POWER SUPPLIES

A. Power Supplies: Type as recommended by camera and lens manufacturer.

1. Enclosure: NEMA 250, Type 1.

2.6 CAMERA-SUPPORTING EQUIPMENT

A. Manufacturers: Subject to compliance of existing system.

B. Minimum Load Rating: Rated for load in excess of the total weight supported times a minimum safety factor of two.

C. Pan-and-Tilt Units: Motorized units arranged to provide remote-controlled aiming of cameras with smooth and silent operation and equipped with matching mounting brackets.

1. Panning Rotation: 0 to 355 degrees, with adjustable stops.
2. Tilt Movement: 90 degrees, plus or minus 5 degrees, with adjustable stops.
3. Speed: 12 degrees per second in both horizontal and vertical planes.
4. Wiring: Factory prewired for camera and zoom lens functions and pan-and-tilt power and control.
5. Built-in encoders or potentiometers for position feedback.
6. Pan-and-tilt unit shall be available with preset positioning capability to recall the position of a specific scene.

D. Mounting Brackets for Fixed Cameras: Type matched to items supported and mounting conditions. Include manual pan-and-tilt adjustment.

E. Protective Housings for Fixed and Movable Cameras: Steel enclosures with internal camera mounting and connecting provisions.

1. Tamper switch on access cover sounds an alarm signal when unit is opened or partially disassembled. Central-control unit shall identify tamper alarms and indicate location in alarm display. Tamper switches and central-control unit are specified in Division 28 Section "Intrusion Detection."
2. Camera Viewing Window: Polycarbonate window, aligned with camera lens.
3. Duplex Receptacle: Internally mounted.
4. Alignment Provisions: Camera mounting shall provide for field aiming of camera and permit removal and reinstallation of camera lens without disturbing camera alignment.
5. With sun shield that does not interfere with normal airflow around the housing.
6. Mounting bracket and hardware for wall or ceiling mounting of the housing. Bracket shall be of same material as the housing; mounting hardware shall be stainless steel.
7. Finish: Housing and mounting bracket shall be factory finished using manufacturer's standard finishing process suitable for the environment.
8. Enclosure Rating: IEC 60529, IP 52

2.7 COLOR MONITORS

A. Manufacturers: Subject to compliance of existing system.

B. Screen Size (Diagonal Dimension): 42”

C. Horizontal Resolution: 300 lines.

D. Minimum Front Panel Devices and Controls: Power switch, power-on indicator, and brightness, contrast, color, and tint controls.

E. Degaussing: Automatic.

F. Electrical: 120-V ac, 60 Hz.

2.8 SIGNAL TRANSMISSION COMPONENTS

A. Cable: Coaxial cable elements have 75-ohms nominal impedance. Cables shall comply with Division 27 Section "Master Antenna Television System."

B. Video Surveillance Coaxial Cable Connectors: BNC type, 75 ohms. Of three-piece construction, consisting of a crimp-type center tit, sleeve, and main body.

PART 3 - EXECUTION

3.1 WIRING

A. Wiring Method: Install cables in raceways, except in accessible indoor ceiling spaces**,** and as otherwise indicated. Conceal raceways and wiring except in unfinished spaces.

B. Wiring Method: Install cables concealed in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train conductors. Provide and use lacing bars and distribution spools.

D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

E. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.2 VIDEO SURVEILLANCE SYSTEM INSTALLATION

A. Install cameras with 84-inch- (2134-mm-) minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.

B. Set pan-and-tilt unit stops to suit final camera position and to obtain the field of view required for camera. Connect all controls and alarms, and adjust.

C. Avoid ground loops by making ground connections at only the control station.

1. For 12- and 24-V dc cameras, connect the coaxial cable shields only at the monitor end.

D. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation and supervise pretesting, testing, and adjusting of video surveillance equipment.

B. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video surveillance equipment for acceptance and operational testing as follows:

1. Verify operation of auto-iris lenses.

2. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
3. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 50 to 75 feet (17 to 23 m) away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
4. Set and name all preset positions; consult Owner's personnel.
5. Set sensitivity of motion detection.
6. Connect and verify responses to alarms.
7. Verify operation of control-station equipment.

C. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.

D. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation.

E. Record test results for each piece of equipment.

F. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

END OF SECTION 282300

New Security Vestibule at

Ballenger Creek Middle School

Ballenger Creek Pike –
Frederick, Maryland

May 15, 2018

Bidding Documents
FCPS Bid #??

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New Security Vestibule for
Ballenger Creek Middle School
Frederick, Maryland

Proj. #15-30.02 Construction Documents

GENERAL REQUIREMENTS

MECHANICAL/ELECTRICAL/PLUMBING SECTIONS

SECTION 01 10 00

GENERAL REQUIREMENTS

SECTION 01 10 00 - GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY OF WORK

Furnish all labor, materials, equipment, and services necessary for, incidental to, the construction of a Security Vestibule at the interior of Ballenger Creek Middle School. All work shall be bid as lump sum as indicated on the drawing and specifications as prepared by Proffitt and Associates. Work shall be coordinated with the Owner. Work is to be completed at a time frame dictated by the Owner's Representative when the area will be available for work. Work is further described as follows:

A. The existing school building consists of a single story structure with steel frame and non-load bearing masonry construction.

Work includes removal of interior hollow metal doors/frames and windows and partial removal of non-bearing masonry walls as shown on the drawings. The new vestibule compartment will be primarily constructed with an aluminum storefront system with entrance doors and side lights. Work associated with secondary finishes systems such as gypsum board on metal studs, flooring, painting, and acoustical ceilings will also be included.

Work also includes installation of access control door hardware and associated security devices.

Minor modifications to Mechanical and Electrical systems to support the vestibule and associated upgrades to the existing Admin. Office is required.

Additional Structural and Masonry work is not required.

B. All work is indicated on the contract documents and is limited to Architectural work with some minor Mechanical and Electrical work**.**

1. Contractor shall provide a detailed schedule of values for all work included in the project broken down by trade.

C. The Owner will continue to conduct limited operations in this facility during construction and renovation. The General Contractor shall coordinate all phasing aspects with the owner to ensure that existing public areas and egress components can be used to the greatest extent possible during construction operations, and to maintain building security.

1.2 LOCAL CONDITIONS

A. The contractor shall check, measure and verify all site conditions and be responsible for familiarizing themselves with the nature, extent and quantity of the work. Where drawings or specifications conflict with existing field conditions, Contractor shall

notify the Owner's Representative. The Owner will then give written directions and or clarifications on how to proceed.

B. The Contractor is responsible for verification of all utility locations and the repair of same if damaged during construction. The Contractor shall restore to the original condition all damages due to construction.

1.3 APPLICABLE CODES AND STANDARDS

A. All work shall conform to all applicable local, state or federal building codes, regulations and 2010 A.D.A. regulatory requirements.

1.4 INQUIRIES

A. All inquiries pertaining to this project shall be made to Mr. Brad Ahalt, Project Manager for FCPS Construct Management Dept, Frederick County Public Schools, phone 301-644-5164. Email: bradley.ahalt@fcps.org.

1. Mr. Brad Ahalt will serve as the Owner's Representative.

B. The site is available for inspection prior to bid by calling the Project Manager to make arrangements to coordinate a site visit that doesn't interfere with business activities.

1.5 OPENING

A. Proposals will be opened as announced in the "Invitation to Bid."

1.6 AWARD OF BID

A. The Contract will be awarded as stated in the "Instructions to Bidders."
In addition, Frederick County Public Schools reserves the right to accept or reject any or all proposals for any reason whatsoever and will not be responsible for any charges incurred by contractors.

1.7 SCHEDULE OF WORK

A. Demolition/construction work to begin on or about June ??, 2018 with substantial completion of base bid work by August ??, 2018. Final completion date of base bid work is September ??, 2018.

B. The contractor has full access to the building as necessary during the above timeline 7 days a week and as allowed by local ordinances. Once staff return for the fall term access will be restricted to comply with the instructional schedule.

C. FCPS is on 4 day 10 hour work week over the summer recess; there will be no staff on site Friday, Saturday or Sunday from mid-June to Mid-August however FCPS will make accommodations for access during those days as necessary.

1.8 LIQUIDATED DAMAGES

A. Liquidated damages in the amount of $475.00 per day for each calendar day beyond completion date of August ??, 2018 will be assessed by the Owner.

1.9 SPECIAL CONDITIONS

A. Asbestos- Containing Buildings:
Although, most Frederick County Public School buildings contain asbestos, it is not anticipated that any ACM's (Asbestos Containing Materials) will be encountered as part of this work. At the pre-construction meeting a detailed procedure of asbestos removal (should any be encountered in the building) will be given to the contractor.

B. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. Use adequate but reasonable precautions to prevent the spread of dust, dirt and noise to adjacent areas.

1.10 PERMITS AND INSPECTIONS

A. If applicable, the Owner shall obtain and pay for the primary building permit for this project. However, the Contractor shall obtain and pay for all secondary trade permits and inspection fees required for all local, state or federal applicable codes.

B. The Contractor shall supply the Owner with a copy of all permits and inspection reports.

1.11 CUTTING AND PATCHING

A. Saw-Cut to fit, patch to match all existing surfaces which are cut for installation of new materials and equipment or the demolition of existing materials. No cutting or patching of utilities or other structures shall be done without the specific permission of the Owner.

1.12 PROJECT COORDINATION AND MEETINGS

A. Coordination: Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

B. Meetings:

1. A pre-bid meeting will be held at the Ballenger Creek Middle School as described in the invitation for bids.

2. A pre-construction meeting will be held after the project is awarded and before construction begins.

3. Progress meetings will be held as deemed necessary by the Owner but not less than one meeting every two weeks.

1.13 SUBMITTALS

A. General: Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities and as noted in other sections of these specifications. Transmit in advance of performance of related activities to avoid delay. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.

1. All submittals shall include, but not be limited to, name and address or contractor, name and address of subcontractor, name and address of supplier and name of manufacturer. If applicable all submittals shall show compliance with recognized trade association standards and recognized testing agency standards with appropriate labels and seals.

B. Shop Drawings: The Contractor shall submit for approval three (3) copies of shop drawings or submittals for all phases of construction and materials to be used.

C. Product Data: Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information.

D. Samples: Submit two (2) samples of each system component.

1.14 QUALITY CONTROL

A. Responsibilities: The Contractor is to provide inspections and tests specified or required by governing authorities, and as indicated in other sections of these specifications. Costs are included in the Contract.

B. Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents.

C. Coordination: The Contractor is responsible for scheduling inspections, tests, and similar activities.

D. Submittals: The Contractor shall submit a certified written report of each inspection and test in duplicate.

1.15 CONTRACTOR USE OF PREMISES

A. Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

B. Confine operations to areas within contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

C. Keep driveways and entrances clear at all times. Do not use these areas for parking or storage of materials. After completion date of August ??, 2018 no materials will be stored at the site.

D. Use of the Existing Building: Maintain the existing building in an operational condition throughout construction. Repair damage caused by construction operations. Take precautions necessary to protect the building and occupants during the construction period.

E. Full Owner Occupancy: The Owner will occupy the site and existing building during construction. Cooperate with the Owner to minimize conflicts and facilitate Owner usage. Perform the work so as not to interfere with the Owner's operations.

1.16 RECORD AND OPERATIONS & MAINTENANCE DATA

A. If not indicated in other parts of these specifications provide the following as indicated. Record Document Submittals, Record Drawings, Record Specifications, Maintenance Manuals, Operating and Maintenance Instructions and As-Built Drawings.

1. Record Document Submittals: Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the Owner's reference.

2. Record Drawings: ("As-Builts") Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark-up these drawings to show the actual installation. Mark whichever drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

a. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.

3. Additional Record Drawings:
At the completion of the project, the Contractor shall obtain an AutoCAD drawing file (i.e. floor plan, site plan) from the Engineer and update the file from the "as-built" drawings. The updated AutoCAD file shall be returned to the Engineer for his review, then released to the Owner at the completion of the project.

4. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.

5. Maintenance Manuals: Organize maintenance data into three (3) sets of manageable size. Bind in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. This shall include but is not limited to the following information:

   Emergency instructions.
   Spare parts list.
   Copies of warranties.
   Wiring diagrams.
   Inspection procedures.
   Shop Drawings and Product Data.

6. Operating and Maintenance Instructions: Arrange for the Manufacturer's Representative and Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. This shall include but is not limited to a detailed review of the following:

   Maintenance manuals.
   Spare parts and materials.
   Control sequences.
   Hazards.
   Warranties and bonds.
   Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

   Start-up and shutdown.
   Emergency operations.
   Safety procedures.

1.17 WARRANTY

A. In submitting a proposal, each bidder thereby represents that he will, upon award of the contract, guarantee in writing all materials and workmanship for a period of Two (2) years from date of substantial completion. During the guarantee period the Contractor will be required, within a reasonable length of time after receipt of written notice by the Owner, to make good any defects in materials or workmanship which may have developed and to make good any damage to other work caused by such defects or the repairing of the same, at his own expense and without cost to the Owner.

b. If a bidder cannot guarantee any material, construction and equipment that is shown or specified, or if he cannot furnish any surety bond that may be required, then it shall be so stated in his proposal, and unless this is done, it shall be understood that the bidder accepts all of the guarantee conditions called for, and he shall be bound thereto upon award of the contract. If the Owner should consent to waive any requirements in this respect, then it shall have effect only if such waiver is expressly set forth in the signed contract agreement.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock.

B. "Materials" are products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

D. Product Delivery, Storage, and Handling: Deliver, store and handle products in accordance with manufacturer's recommendations, using methods that will prevent damage, deterioration and loss.

E. Materials Storage and On-Site-Work: The Contractor shall maintain the site in a clean, neat and orderly manner at all times. Materials may be stored at the school in a designated site agreed to by both the Contractor and the Owner's project manager.

F. Installation of Products: Comply with manufacturer's instructions and recommendations for installation of products. Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Removal of Existing Products, Materials or Equipment: The Contractor shall "Remove" all existing products, materials or equipment as designated in the summary of work and as indicated in other sections of these specifications. The contractor shall be responsible for the disposal of these items at no cost to the owner.

PART 3 – EXECUTION

3.1 PROJECT CLOSEOUT

A. Substantial Completion: Before requesting inspection for certification of Substantial Completion, complete the following:

1. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

2. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar record information.

3. Change-over permanent locks and transmit keys to the Owner.

4. Complete start-up testing of systems, and instruction of the Owner's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

5. Complete final clean up. Touch-up and repair and restore marred exposed finishes.

6. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.

B. Site Restoration:

1. The Contractor shall be responsible for repairs to the grounds, building and/or blacktop due to traffic and/or the storage of materials. Repairs shall be made to the satisfaction of the Owner's representative and shall equal the original conditions.

C. Final Cleaning: Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following before requesting inspection for certification of Substantial Completion:

1. Remove labels that are not permanent labels.

2. Clean transparent materials.

3. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps. Clean the site of rubbish, litter and other foreign substances. Sweep paved areas; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

D. Removal of Protection: Remove temporary protection and facilities.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

(END OF SECTION)

SECTION 01 21 00

ALLOWANCES

A. GENERAL:

1. Each Bidder shall carry separately in the Base Bid sum (except where noted below) a cash allowance as follows, for unforeseen conditions and items of work to be selected by the Owner during the course of construction. The allowance is for the purchase of materials, equipment, labor and installation, overhead and profit, and other handling costs. If additional work associated with an allowance is requested by the Owner (above the stated quantity), the Contractor can be entitled to extra compensation based on the quantity of additional work multiplied by a negotiated unit price for that work item. If at the end of the project a balance remains on any allowance amount, the remaining portion will be credited back to the Owner based on the quantity remaining multiplied by the negotiated unit price for that work item.

B. ALLOWANCES:

1. Contractor shall include the following items or amounts in the **Base Bid** as described below:

Allowance A - The following work items will be included in the Base Bid as an Allowance:
Include amount of…….. …. …….. $??.00

2. The contractor shall coordinate Subcontractors as required for work items noted above in order to ensure that all work is completed in a timely and efficient manner.

– END OF SECTION 01 21 00 –

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Definitions and Explanations: "Alternates" are defined as alternate products, materials, equipment systems, methods, units of work for major elements of construction, which may, at Owner's option be selected for work in lieu of corresponding requirements of Contract Documents.

1. Alternates may or may not change scope and general character of work substantially.

B. Accepted Alternates: Refer to Owner-Contractor Agreement and subsequent modifications thereof (if any) for determination of which alternates listed have been accepted, and are, therefore, in full force and effect as though originally included in Contract Documents for base bid.

C. Notification: Immediately following award of contract, prepare and distribute to each entity or person to be involved in performance of work, notification of status of each alternate scheduled and including those subsequently added by notification during bidding. Indicate which alternates have been: 1) accepted, 2) rejected, and deferred for consideration at later date as indicated. Include full description of negotiated modifications to alternates, if any.

D. Requirements of the General Conditions, Supplementary Conditions and Division I of these specifications apply to this section.

E. The work under these Alternates shall be performed in accordance with the applicable Sections of these specifications.

1.2 GENERAL ALTERNATE REQUIREMENTS

A. General: Description for each alternate is recognized to be incomplete and abbreviated but implies that each change must be complete for scope of work affected. Refer to applicable sections (Divisions 2 through 16) and to applicable Drawings for specific requirements of each alternate. Coordinate related requirements among sections of Specifications as required. Modify surrounding work as required to integrate with work of each alternate.

1.3 ALTERNATE DESCRIPTIONS

A. Alternate No. 1A to the Base Bid – In lieu of manual hardware, provide and install access control hardware interlocked with class schedule timeclock at both sets of cross corridor doors.

B. Alternate No. 1B to the Base Bid – As an additional feature to Alt #1A, provide and install card reader access control system at both sets of cross corridor doors.

– END OF SECTION 01 23 00 –

SECTION 01 45 00

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 Scope:

1. This Section establishes general requirements pertaining to cutting, fitting and patching of the Work required to:

    1. Make the several parts fit properly;

    2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;

    3. Remove and replace work not conforming to requirements of the Contract Documents; and

    4. Remove and replace defective work.

    5. Remove and patch existing construction for the completion of contract work.

1.2 Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, the General Conditions and Sections in Division 1 of these Specifications.

2. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing, to verify conformance with the Contract Documents.

3. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.3 Quality Assurance:

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. Avoid unnecessary or excessive cutting. Where cutting of a finished surface is required, make cuts neatly along true lines so they will be concealed by finished work and where they will be least conspicuous.

1.4 Submittals:

1. Request for Architect's consent:

    1. Prior to cutting which effects structural safety, submit a written request to the Architect for permission to proceed with cutting. Also obtain written approval from the local building officials, if required by the local building code.

    2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and the required Change Order prior to proceeding.

Notices to the Architect:

3. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.

4. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

PART 2 - PRODUCTS

2.1 For replacement of items removed, use materials complying with pertinent Sections of these Specifications and closely matching the aesthetic value of the existing material.

PART 3 - EXECUTION

3.1 Payment of Costs:

1. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is approved by the Owner. The Contractor shall perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

2. Payment of costs for cutting and patching performed due to ill-timed or defective work will be at no additional cost to the Owner.

3.2 Surface Conditions:

1. Inspection:

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching and backfilling.

2. After uncovering the work, inspect conditions affecting installation of new Work.

2. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.

2. Do not proceed until unsatisfactory conditions are corrected.

3.3 Preparation Prior to Cutting:

1. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.4 Performance:

1. The Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work except as otherwise specifically provided in the Contract Documents. The contractor shall not endanger any Work of any other Contractor except with the written consent of the Architect.

2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

3.5 Cleanup:

1. Remove all debris, rubbish, and materials resulting from cutting and patching operations. Transport materials and legally dispose of off site.

END OF SECTION

SECTION 02 11 00

SELECTIVE DEMOLITION

A. GENERAL

1. DESCRIPTION:

1.1 Requirements of the General Conditions, Supplementary Conditions and Division 1 of these specifications apply to this Section.

1.2. Include all labor, materials, appliances and services necessary to complete all demolition work required by the drawings and/or described in this specification.

1.3 Demolition includes the complete removal of building materials, as indicated on the drawings, and proper disposal, off site, of all demolished materials except where noted. Where noted, some materials may be salvaged for reuse on the project and Owner is entitled to a right of first refusal for all materials identified to be demolished.

1.3.1 See Division 15000 for Mechanical portion, and Division 16000 for Electrical portion of demolition.

2. QUALITY ASSURANCE:

2.1 All work of this Section shall be carefully executed without damage to adjacent construction shown to remain for post construction occupancy.

2.2 All materials scheduled to be relocated or reinstalled shall be removed, cleaned, and stored in such manner that they are not damaged. This includes but is not limited to cabinets and counter tops, interior doors, and interior windows.

2.3 All equipment removed as part of this Contract, and selected by the Owner to be stored for future use by the Owner, shall be delivered to the Owner's storage area.

2.4 Maintain all legal means of egress for adjacent and affected occupied areas during all demolition activities.

3. CONDITION OF STRUCTURES:

3.1 The Owner assumes no responsibility for the actual condition of structures to be demolished.

3.2 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within the structure may occur due to work completed by the construction of earlier phases of this Project, and/or by Owner's removal and salvage operations prior to the start of the demolition work.

3.3 The Owner will be removing furnishings as required to make the work area accessible for operations.

B. EXECUTION

4. GENERAL:

4.1 Perform demolition in a systematic manner, in accordance with approved submittals.

4.2 Where required to install new finishes. Remove existing materials in a manner to accommodate new finishes including removal of all coatings, grouts, adhesives, and other bonding agents.

4.3 Where existing finishes are to remain and abut adjacent new construction, cut and remove existing materials in a neat fashion with straight edges without chipping or cracking.

5. TRAFFIC:

5.1 Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

6. PROTECTION:

6.1 Provide fenced passageways, as required, to ensure the safe passage of persons around the area of demolition. Conduct operations to prevent damage by falling debris or other cause to adjacent buildings, structures, landscaping and other facilities as well as persons.

6.2 Provide dust-tight barriers as required to separate construction/demolition areas from building areas occupied by the Owner during the construction period.

6.3 Cover and protect furnishings that will remain in place during the course of construction.

6.4 Cover and protect floor finishes that will remain in place during the course of construction.

6.5 Provide a weather tight and secure barrier immediately upon removal of items from exterior walls such as louvers, doors, and windows.

7. DAMAGES:

7.1 Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to the Owner.

8. UTILITY SERVICES:

8.1 Maintain existing utilities, indicated to remain, keep in service, and protect against damage during demolition operations.

8.2 Do not interrupt existing utilities serving occupied or used facilities, except when authorized by the Architect. Provide temporary services during interruptions to existing utilities, as acceptable to the Architect.

9. POLLUTION CONTROLS:

9.1 Use water sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air, to the lowest level of air pollution practical for the condition of work. Comply with the governing regulations.

9.2 Clean adjacent structures and improvements of all dust, dirt and debris caused by demolition operations, as directed by the Architect. Return areas to condition existing prior to the start of the work.

10. REMOVAL:

10.1 General: Remove from the site all debris, rubbish and other materials resulting from demolition operations. Storage or sale of materials will not be permitted on the site.

10.2 Burning: Burning of removed materials from demolished structures will not be permitted on the site.

10.3 Removal: Transport all materials, not scheduled to be delivered to the Owner, removed from demolished structures and disposed of off the site.

10.4 Recycling: Ceiling Tile shall be recycled by the original manufacturer (Armstrong) to the greatest extent possible.

- End of Section -

SECTION 05 40 00

COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Non-structural wall framing on interior of building

B. Metal furring strips

1.2 RELATED SECTIONS

A. Section 09260 – Gypsum Board Systems

1.3 QUALITY ASSURANCE:

A. All work shall be in compliance with the Standard Specifications for Structural Steel for Building, and the Code of Standard Practice, adopted by the American Institute of Steel Construction. All metal stud work engaging architectural finishes shall be straight, plumb and true, and shall in no way interfere with the installation of such finishes.

1.4 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

1.5 WEATHER CONDITIONS

A. Comply with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal Framing:

1. Cold Formed (light gauge) Metal Framing (in non-structural locations): Materials shall conform to ASTM A1003, dimensions as indicated on the supplier's approved shop drawings, galvanized per ASTM A1003 with a minimum G40 coating. Wall framing is to be a minimum 20 gage at a maximum spacing of 16" on center. Provide bridging, accessories and fasteners as required by job conditions and the supplier's engineered shop drawings. Gage and strength to be determined by supplier as required for conformance with building code requirements.

2. See structural notes and drawings for additional product requirements.

B. Metal Furring:

1. Roll formed, hat-shaped sections of minimum 20 gauge galvanized steel, size 0.875" x 2.75"

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install metal framing as indicated on the drawings and in compliance with manufacturer's instructions, securely attaching track to structure as indicated on the drawings, and studs to track at 16" on center, unless otherwise noted. Provide deflection track as required.

B. Finished surfaces shall be smooth, uniform and ready to receive architectural finishes and decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

3.2 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

- END OF SECTION 05 40 00 -

SECTION 07 90 00

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparing substrate surfaces.

B. The required applications of sealants include, but are not limited to, the following general locations in new work, or in areas disturbed by the work of this project:

1. Interior:

a. Control and Expansion joints.
b. Metal Door and window frames.
c. Joints at all surfaces to receive opaque finish.
d. Joints between steel columns and masonry walls.
e. Joints between all dissimilar materials unless otherwise noted.
f. Other as indicated.

1.2 RELATED SECTIONS

A. Section 08800: Sealants required in conjunction with glazing methods.

1.3 REFERENCES

A. ASTM C790 - Use of Latex Sealing Compounds.

B. ASTM C804 - Use of Solvent-Release Type Sealants.

C. ASTM C834 - Latex Sealing Compounds.

D. ASTM C920 - Elastomeric Joint Sealants.

E. ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers.

F. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations and color availability.

C. Samples: Submit two samples illustrating sealant colors for selection.

D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Specified work shall be installed by skilled tradesmen, experienced in the application of the types of materials.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum five years documented experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation. Apply compound prior to final coat of paint.

1.8 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Deliver all materials to job site in factory sealed and labeled containers; label shall show: Manufacturer, Type, Date of Manufacture, Shelf Life, Curing Time at 70 degrees F, Color and Manufacturer’s Instructions.

1.9 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.10 WARRANTY

A. Provide five year warranty under provisions of Division 1.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.0 MANUFACTURERS:

A. Sika Corporation

B. Pecora Corporation

C. Sonneborn – Chemrex

D. Tremco, Inc.

2.1 SEALANTS

A. Back-up Materials: Flexible closed cell, expanded polystyrene or polyethylene round rodding, with diameter 1.333 times width of joint

B. Interior Sealant: Acrylic Emulsion Latex Type C: ASTM C834, single component; color as selected by the Architect

C. Interior Walls/Floors (Ceramic Tile): Pecora Urexpan NR-201, one part, self-leveling, moisture curing polyurethane sealant, designed for horizontal joints, Fed. Spec. TT-5-00230C, Type I, ASTM C920, color as selected by the Architect

D. Primers, Cleaners and Bond Breaker Tape: Provide as recommended by sealant manufacturer's installation instructions for the conditions and locations indicated on the drawings.

E. All sealants and sealant primers must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 percent larger than joint width; manufactured by Dow Chemical, Sonneborn or approved equivalent.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

B. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Division 1.

B. Protect sealants until cured.

- END OF SECTION 07 90 00 -

SECTION 08 12 00

ALUMINUM ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aluminum doors and frames associated with new aluminum entrances and storefronts.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

C. Related Sections:

1. Section 07900 - Joint Sealants: Caulking between aluminum and adjoining building construction.

2. Section 08710 - Finish Hardware: Finish hardware including cylinders.

1.2 SCOPE

A. Thermal Movement: Fabricate exterior components from manufacturer's stock systems, which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F.

B. Wind Loading: Fabricate exterior components from manufacturer's stock systems which have been tested in accordance with ASTM E-330 to withstand at least the following loadings:

1. Uniform pressure of 20 pounds per square foot inward and 20 pounds per square foot outward.

C. Deviations: Plans, elevations and details show spacing of members as well as profile and similar dimensional requirements of aluminum entrances and storefront work. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in Architect's sole judgment; such deviations do not materially detract from design concept or intended performances.

1.3 STANDARDS

A. Reference: Comply with applicable provisions of AAMA, Metal Curtain Wall, Window, Storefront and Entrance Guide Specifications Manual.

1.4 SITE CONDITIONS

A. Field Measurements: Take field measurements; check elevations and connecting work affecting Work of this Section.

B. The finish hardware supplier shall be responsible for furnishing physical hardware to the entrance manufacturer prior to fabrication. The finish hardware supplier shall also be responsible for coordinating hardware delivery requirements with the hardware manufacturer, the general contractor and the entrance manufacturer to insure the building project is not delayed.

1.5 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

1. Include elevations, detail sections of typical composite members, anchorages, reinforcement and expansion provisions.

B. Samples: Submit samples of each type and color of aluminum finish on 12 inch long sections of extrusions or formed shapes and on 6 inch square sheets.

C. Product Data: Submit manufacturer's specifications, standard details and installation recommendations for components of aluminum entrances and storefronts required for project, including data that products have been tested and comply with performance requirements.

1.6 WARRANTIES, GUARANTEES, TESTING

A. Provide written warranty signed by manufacturer, installer and contractor agreeing to replace aluminum entrances and storefront, which fail in materials or workmanship within two years of acceptance. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware, weather-stripping and other components of the work.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following:

1. Kawneer Company, Inc.

2. Vistawall Architectural Products

3. YKK AP America, Inc.

4. Substitutions: Section 01600 - Product Requirements.

2.2 MATERIALS

A. Aluminum Extrusions: Conform to ASTM B-221, Type 6063-T5 or alloy consistent with desired finish, not less than 0.125 inch thickness for all principal members; other interior members – 0.050 inch thickness; exterior trim members and snap-on covers - 0.050 inch thickness, minimum.
B. Fasteners: Stainless steel or heat-treated aluminum for unexposed fastening of aluminum-to aluminum and aluminum-to-steel; otherwise, exposed fasteners shall be aluminum-finished in the finish matching the aluminum extrusions.

C. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PS 12 compounded for 30-mil thickness per coat.

2.3 STILE AND RAIL-TYPE DOORS

A. Style: Kawneer Wide Stile Model 500 - modified.

B. Construction: Form from extruded sections, assembled with tension rods, top and bottom, or mechanical bolted joints top and bottom and electric arc sigma-welded without creating blemishes on exposed surfaces.

C. Glazing: Doors shall have extruded aluminum snap-in-glass stops with neoprene insets for puttyless glazing.

2.4 FRAMING SYSTEMS

A. Interior Framing (Nonthermal Break):

1. Framing systems shall be Trifab VG 450 as manufactured by Kawneer or equal as approved by the Architect.

2. The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of 1-3/4 inches. Overall depth shall be 4-1/2 inches. Entrance framing members shall be compatible with glass framing in appearance. All single acting entrance frames shall include the positive barrier weathering.

B. Construction:

1. Tubular sections shall be extruded aluminum not less than 1/8-inch thickness, type as indicated on the drawings, designed for 1 inch insulating glass.

2. Door stops shall be applied to tubular sections with concealed fastenings and shall be fitted with neoprene or wool pile insert for weatherproofing and silencing.

3. Door frames shall have butts fully mortised with steel tapping backing plates. No slotting of frames will be permitted.

4. Glass Stops: Sash members shall have permanent clips to hold glass in place before face member is installed.

2.5 ALUMINUM CLOSURES

A. Where closures (break metal) are indicated and required, provide angles and covers formed of 0.125-inch minimum thickness aluminum with matching finish herein specified.

2.6 FINISH

A. All exposed surfaces shall be free of die marks, grinding marks, spots, streaks or other blemishes and shall have the following finishes.

1. Provide Anodized finish system - Clear.

PART 3 EXECUTION

3.1 INSPECTION

A. Condition of Surfaces: Installer shall inspect the substrates to which the work of this section adjoins. No work shall be installed until corrections to substrates have been performed by the trades involved.

3.2 INSTALLATION

A. Framing Members: Install in accordance with manufacturer's approved shop drawing in prepared opening. Members shall be level, square, plumb and at proper elevations and in alignment with other work.

B. Cutting and Fitting: All materials shall be accurately cut and fitted and rigidly secured in place. All cut and machined ends and recesses shall be true, accurate and free of burrs or rough edges.

C. Fastenings: For block walls, use only with toggles with finished heads; fastenings in concrete walls may be made with bolts let into expansion sleeves. Provide 1 inch diameter access hole in aluminum tube for installation of anchoring bolts. Access hole shall be located under doorstop.

D. Use care in subsequent operations to prevent distortion or damage and replace any damaged work with new material.

E. Caulking: Provide clearance between storefront metal and opening substrate for caulking with adjoining building construction. All joints in storefront metal shall be sealed during fabrication.

F. Hardware: Properly install and adjust. Final adjustment shall be made for proper and easy operation of the doors after glazing.

3.3 CLEANING AND PROTECTION

A. Cleaning: After installation, framing members shall be cleaned following procedure recommended by the manufacturer.

B. Dissimilar Materials: In addition to the finish specified, aluminum surfaces that will contact masonry, concrete, wood or steel shall be protected from contact by a coat of bituminous paint to prevent galvanic or corrosive action.

C. Masking: Apply waterproof masking tape to aluminum surfaces remaining exposed on the interior of the building, which may be splattered with mortar, plaster, paint or other disfiguring materials.

D. Protection shall be as recommended by the manufacturer and approved by the Architect. The contractor shall protect storefront from damage during subsequent construction activities. Damaged materials shall be replaced at no additional cost to the Owner.

3.4 OWNER'S INSTRUCTIONS

A. Instructions: Owner's representative shall be given written and verbal instructions as to the procedures required for keeping the work herein specified, maintained, cleaned with appropriate products and adjusted.

B. Tools: Adjusting wrenches and small tools furnished with operating hardware shall be turned over to Owner's representative, properly tagged.

C. Control: The foregoing shall not relieve the contractor of any responsibilities under the guarantee specified hereinbefore.

- END OF SECTION 08 12 00 -

SECTION 08 71 00 - FINISH HARDWARE
(Updated by FCPS Jan. 3, 2013)

PART 1 GENERAL

1.1 DESCRIPTION:

A. Provide all work necessary to complete all finish hardware work as shown on the drawings or inferable therefrom and/or specified herein, In accordance with the requirements of the Contract Documents.

1.2 RELATED SECTIONS:

A. 06200: Finish Carpentry
B. 08110: Steel Doors and Frames
C. 08210: Wood Doors
D. 08410: Aluminum Storefront Systems (this section shall require hardware by section 08710 specified herein).
E. 16700: Electrical Work
F. Overhead Roil-up Doors (7-pin i.e. cylinder)
G. Kitchen Equipment (7-pin i.e. cylinder)
H. Sound Module (9K cylindrical lock)
I. Folding Doors and Partitions (7-pin I.e. cylinder)
J. Security Gate (7-pln cylinder)
K. Walk-in Freezer or Refrigerator (Best 7-pin padlock)
L. Elevators/ADA Chair Lift (7-pln i.e. cylinder)

1.3 DETAILS OF WORK:

A. Refer to drawings, details and schedules for Items requiring finish hardware. It is the intent of this section to include all finish hardware required for the project, except for items, which are specifically noted as being specified in other sections of the specifications.

B. Coordinate the application of hardware items with door and frame details and with methods of fastening as hereinafter specified.

C. Furnish complete templates, schedules and fastening details to door and frame manufacturers and other trades requiring same, to insure doors and frames are properly cut, reinforced and prepared to receive hardware.

D. Single source, furnish only the products of one manufacturer where several manufacturers are specified for one type of hardware.

E. Work includes, but not limited to the following Items:

Hinges
Lock and latch sets

Deadlocks
Exit devices and removable mullions
Door closers
Electro-magnetic door release
Electro-magnetic locks
Power supply Key
switch
Overhead stops and holders
Push and pull plates
Kick and armor plates
Flush bolts
Floor and/or wall stops
Thresholds
Astragals
Weather-stripping
Gasketing
Door silencers
Key cabinet

F. Work specified to be provided under other sections, includes rough carpentry and Items of finish hardware so specified or provided as part of other sections, Including the following;

Hardware For:

Windows
Toilet partitions
Operable partitions
Lockers
Cabinets or casework
Roof scuttles
Fence or gates

1.4 REQUIREMENTS OF REGULATORY AGENCIES:

A. Furnish finish hardware in accordance with the requirements, under the published procedures of the following recognized agencies. Wherever possible all hardware and its application are intended to comply with the latest edition of CASO/ANSI A117.1, NFPA 80, NFPA 101 and NFPA 105. It is the intent of this specification that all hardware and Its application shall comply or exceed the standards for labeled openings. In case of conflict between type of hardware specified and type required for fire protection, furnish type required by NFPA and UL.

1.5 QUALITY ASSURANCE:

A. All work performed and all materials furnished shall be in conformity with the

contract requirements.

B. All products listed herein are intended to describe quality, type and function of items listed. Accuracy, and strict compliance with the samples and descriptive literature upon which acceptance is based, shall be the sole responsibility of this supplier.

C. If the Architect finds materials or the finished product in which the materials are used are not in complete conformity with the contract requirements and has resulted in an inferior or unsatisfactory product, the materials shall be removed and replaced by and at the expense of the supplier.

D. The supplier shall be responsible for the provisions, proper coordination and function of the finish hardware required for all openings.

1.6 SUPPLIER QUALIFICATIONS:

A. The hardware supplier shall, in the opinion of the Architect, have sufficient experience and shall have an Architectural Hardware Consultant (AHC) as certified by the Door and Hardware Institute, as a full-time employee of Its organization. The Architectural Hardware Consultant shall be available to attend job meetings as required.

B. After delivery of hardware and prior to its Installation, the hardware consultant shall meet with the Architect and Contractor to compare final samples with actual hardware delivered. To assure acceptability, they shall review catalogs, brochures, templates, Installation Instructions, final hardware schedule, and shall rehearse Installation, procedures and workmanship, with special emphasis on unusual conditions to ensure correct technique of installation, and coordination with other work.

C. The hardware supplier shall maintain a warehouse and office within a fifty (50) mile radius of the job and maintain an inventory and field service staff in order to service the project properly.

1.7 SUBMITTALS:

A. Submit, for review, six (6) complete copies of the finish hardware schedule covering complete Identification of all Items required for the project. Include manufacturer's names and Identification of finishes. Include six (6) complete copies of catalog cuts and/or technical data sheets, identifying each item of hardware and any other data as may be required to show compliance with these specifications. The data on the shop drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Architect to review the information as required. These schedules shall be prepared in conformity with the best practice and standards of the Door and Hardware Institute.

B. Include a separate keying schedule, which shall Include Architect's door numbers, hardware headings, room description numbers and Owner's revised room description numbers as part of the final submittal of the hardware schedule. Schedule format to include an additional column to allow for Owner's revised room description numbers. Upon final approval of the keying requirements by the Architect and Owner, the Owners room numbers shall be listed in the appropriate column and resubmitted to Frederick County Public Schools for final review and approval.

C. The Architect's review of schedules shall neither be construed as a complete check nor shall it relieve the Contractor of responsibility for errors, deviations or omissions from the specified requirements to provide complete hardware for the project.

D. After approval of the hardware schedule the hardware supplier shall furnish to FCPS, four (4) complete sets of manufacturers warranties and product data.

All information will be submitted bound in a hardware schedule cover and shall contain the following information in the order as listed:

- Hardware schedule cover sheet
- Index of manufacturer's
- Manufacturers catalog cuts in the order as listed in the index
- Catalog cuts to be color coded and identified
- Warranties to be listed in order of Index the supplier shall also make available to the owner any service manuals for locksets.

1.8 SAMPLES:

A. In conjunction, and concurrent therewith, with the submission of the finish hardware schedule, submit to the Architect, samples of each typical Item of exposed hardware in specified finish. Submission of samples prior to installation Is mandatory. Architect's review of samples will be for design, pattern, finish and color only. All other requirements are the exclusive responsibility of the Contractor.

B. Samples Required

1. Hinges, each type.
2. Lockset with turn lever, lever cylinder.
3. Panic device, rim type with trim.
4. Pulls complete with mounting accessories.
5. Push plate with fasteners.
6. Surface mounted closer.
7. Overhead holder/stop
8. Floor and/or wall bumpers

C. After final review, deliver samples to job site for comparison with hardware delivered for installation. Unblemished samples may be used as part of the

Work.

1.9 PRODUCT HANDLING ANDSTORAGE:

A. Package and label each Item of hardware separately. Tag each item in accordance with the final hardware schedule. Each package shall contain appropriate fastenings, instructions and installation templates. Protect all items from loss or damage in shipment.

B. The General Contractor shall be responsible for receiving and providing an adequate secured storage area for all hardware. Materials shall be stored so as to assure the preservation of its quality and acceptability for the work. Locate stored material to facilitate its prompt inspection by the Architect.

PART 2 PRODUCTS

2.1 GENERAL:

A. Refer to hardware sets for application of individual hardware items as referenced to each opening or function.

2.2 HARDWARE FINISHES:

A. Produce finishes to exact match with Architect's selected samples. Variances in the color of each finish shall be minimized regardless of whether the base metal is cast, forged or stamped, or when plating is applied over steel, brass or bronze. Comparative finishes shall appear the same when viewed two feet apart and three feet away. The two samples shall be under the same lighting conditions and on the same relative plane. The finish for each item of hardware shall match the finish selected for lock and latch sets. The type of finish for each hardware item Is Indicated in the hardware sets.

2.3 HARDWARE MOUNTING HEIGHTS:

A. The following mounting heights shall apply throughout the work unless otherwise shown or specified and shall comply with the locations for hardware as recommended by the Door and Hardware Institute, other than as specified herewith.

Centerline of strike for levers	40 5/16”
Centerline of exit device touch	40”
pad Centerline of strike for	48"
dead locks Centerline of push	40"
plates Centerline of door pulls	40"

2.4 FASTENERS:

A. Provide concealed fastenings wherever possible. The use of self-tapping or sheet metal screws Is prohibited on all hardware except kickplates and push plates. All exit devices and door closers shall be through-bolt mounted.

1. Concealed Fasteners: Furnish hardware items complete with appropriate type and length of screws or other fastenings suitable to ensure proper applicatlon.

2. Exposed Fasteners: Furnish hardware with countersunk Phillips oval head type screws where concealed fastening is not possible. The finish or color of these screws shall harmonize with the product as to finish and material.

2.5 MATERIALS AND MANUFACTURERS:

A. Acceptable manufacturers for the various items specified are listed below. Products of the underlined manufacturers are ones used in this specification to denote the quality, type, design and function of hardware required. The items of hardware as specified by manufacturer's name and product nomenclature shall comply with any additional features and/or modifications such as base material, finishes, fasteners, etc. The manufacturer and supplier shall be responsible to comply with these requirements as a part of their acceptance. The special features as specified supersede the manufacturer's standard product. Only equivalent products of the listed manufacturers will be accepted. Items listed with NO SUBSTITUTE have been requested by Owner to match existing products, No alternate products will be considered for review, provide products as specified.

Hinges Continuous	Hager-Bommer-Ives
Hinges	Ives-Hager
Locksets/Latchsets	Best-No Substitute
Panic Devices	Von Duprln-No Substitute
Mullions	Von Duprin-No Substitute
Overhead Closers	LCN-No Substitute
Auto Operators	LCN-No Substitute
Overhead Holder	Glynn-Johnson-ABH
Electro-Magnetic Door Release	LCN - Rlxson

Push Plates	Ives - Rockwood - Hager
Kick and Armor Plates	Ives - Rockwood - Hager
Flush Bolts	Ives - Rockwood - Hager
Coordinators	Ives - Rockwood - Hager
Stop and Bumpers	Ives - Rockwood - Hager
Thresholds	National Guard - Pemko - Hager
Weatherstripping	National Guard - Pemko - Hager
Gasketing	National Guard - Pemko - Hager
Astragals	National Guard - Pemko - Hager
Door Silencers	Ives - Rockwood - Hager
Key Cabinet	Telkee
Access Control System	Best-No Substitute
Electric Strikes	*Von* Duprin-No Substitute

2.6 HINGES:

A. All hinges shall be of the type and size as specified and shall conform to the latest edition of ANSI/BHMA A156.1 standards and in compliance with NFPA 80 Table 2.8A. Package all hinges with machine or wood screws as required by door and frame construction.

B. Hinges shall be of flush ball bearing design with flat bottom tips and non-rising pins.

C. All non-ferrous type hinges shall be furnished with stainless steel pins as a standard and all exterior hinges shall be stainless steel with a non-removable pin (NRP) feature per hinge.

D. Where the door Jamb and/or trim projects to such an extent that the width of the hinge leaf specified will not allow the door to properly clear the frame or trim, the supplier shall furnish hinges of sufficient width to clear.

E. Types and Manufacturers:

Hager	Bommer	Ives
881279	885000	SBB1
BB1168	BB5004	SB81HW
881191	885006	5881
881199	885006	5881HW

F. Continuous hinges to be used at all aluminum storefront, cross-corridor, stairwell, cafeteria, gymnasium, locker room and exterior openings, and interior openings where doors are greater than 36" wide.

G. Types and manufacturers:

Ives	Hager
112HD	780-112HD
224HD	780-224HD

2.7 CYLINDRICAL LOCKS AND LATCHES:

A. General: Lockset and latches shall be Best 9K extra-heavy-duty cylindrical series with 7-pin interchangeable core. Locks to have solid shank with no opening for access to keyed lever keeper. Lock chassis must be through-bolted outside of the lock chassis prep to prevent rotation of chassis after installation. Lock manufacturer shall provide three-year warranty, in writing, to the Owner, along with three copies of the lock service manual.

B. Strikes shall be 16 gauge, curved brass, bronze, or stainless steel with a 1" deep box construction, and have sufficient length to clear trim and protect clothing.

C. Tubular Deadbolts shall be Best 83T with 7-pin interchangeable core.

D. Note: Mortise-type locksets will not be acceptable.

E. Types and Manufacturer's

Best-No Substitution

1) Lock series and design: 93K7 X 150 X 626
2) Tubular Deadbolts: 83Tx626
3) Cores/Cylinders: 7-pin to match existing system

2.8 PANIC DEVICES:

A. General: Furnish panic devices of the design, type, function and finish as specified

here within.

1. All devices shall be a push through type touch pad design with return stroke fluid dampener and rubber bottoming dampers. Touch pads are to be stainless steel with no exposed rivets or screws and shall exceed height of mechanism case or rail assembly (T·Shaped) to eliminate pinch points. Plastic touchpads are not acceptable.

2. Latchbolts shall be self-lubricating and have a deadlocking feature.

3. Exit devices shall be listed by UL for accident and hazard. Devices shall conform to ANSI A156.3, Grade 1 and conform to NFPA 80 and NFPA 101.

4. All panic devices shall meet the performance tests found in the Underwriters Laboratories Standard UL305 and bear the UL listing mark for panic hardware or UL 305 and UL 10C for fire exit hardware as appropriate.

5. All exit devices shall be through bolted. All trim shall be through bolted by means of concealed fasteners.

6. A factory representative to insure proper adjustment and operation shall inspect all devices after installation. The representative shall submit a written report to the Architect with copies to the General Contractor and hardware supplier upon completion of his service. This report shall include any Installation problems, noting door numbers and location along with recommendations to correct the problem.

7. All non-fire labeled exit devices shall have cylinder-dogging feature. Dogging mechanism shall be mechanical hook type with no plastic dogging cams.

8. All surface strikes shall be roller type and come complete with a locking plate underneath to prevent movement.

9. End caps shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide flush alignment with device cover plate. When end cap is installed, no raised edges will protrude.

10. Lever trim shaII be heavy-duty type with a breakaway feature to limit damage to the unit from vandalism and fastened by means of concealed welded lugs and through-bolts from Inside. Trim shall be forged brass with a minimum average thickness of .090" and have forged pulls.

11. Outside trim on exterior doors shall be Ives VR910 DT-US32D, unless near a Knox box then it shall be Ives VR910 NL-US32D.

12. Provide rim exit devices at single doors. Provide two rim exit devices with keyed

removable steel mullion at pairs of doors. Concealed or surface vertical rod exit devices or aluminum mulllons will not be permitted except LBL-Less Bottom latch concealed cable device may be used at cross-corridor applications.

13. Provide QEL-Quiet Electric latch Retraction at electrified exit device applications.

B. Types and Manufacturers:

Panic devices

Von Duprin-No Substitution

XP99 Serles (exterior) 99 Series (interior)
9949/9949-F-LBL(cross-corridor)

C. Types and Manufacturers: Mullions

Von Duprin-No Substitution

KR4954 x
154
Stabilizer
s KR9954
x 499F x
154
Stabilizers

2.9 OVERHEAD SURFACE CLOSER

A. Surface Closers

1. Shall conform to ANSI A156.4, Grade 1, NFPA 80, NFPA 101 and Ul10C.

2. Full rack-and-pinion type closer with non-ferrous cover and cast iron body. Double heat-treated shaft, full complement bearings, single piece forged piston, chrome silicon steel spring, non-critical screw valves; back check, sweep and latch.

3. ISO 9000 certified. Units stamped with date of manufacturer code.

4. All non-sized closer to be independent lab tested for 10,000,000 cycles.

5. Locate closers on interior side of exterior doors and on

the non-public side of interior doors, unless otherwise specified. Closers are to be parallel arm mounted.

6. Closers to be non-sized, field adjustable from size 1 to 6.

7. Furnish all non-sized closers with 11/2" diameter piston.

8. All closers shall be mounted with through-bolts.

9. Provide plates, brackets, and special templates when needed for Interface with
particular header, door, and wall conditions and adjacent hardware.

10. Maximum opening force to meet ADA: Exterior doors 8.5 lb.; interior doors 5 lb.; fire doors 15 lb.

11. Spring Cush (SC} Arms at all exterior, Gym, Cafeteria, Stair, and high traffic openings.

12. Closers tested to 100 hours of ASTM 8117 salt spray test, furnish data on request.

13. Spring power adjustment aided by visible size indicator, i.e. "FAST Power Adjust".

14. Closers to have a stable fluid withstanding temperature range of 120 degrees to- 30 degrees hydraulic fluid

15. Install closers at 180-degree templating to provide maximum ADA compllance.

16. Closer products with any type of pressure relief valve system will not be acceptable.

17. Types and Manufacturers:

LCN-Substitution

4040XP pull-side application 4040XP SCNS push-side application

18. Auto operators shall be supplied as specified in hardware set at the end of this section. Furnish all labor, materials, equipment and services necessary for proper installation of the LCN Senior Swing handicap door system, a low energy power operated door system as defined In current ANSI/BHMA A159.19. All auto operators are to be Installed by a certified LCN installation company. Provide Touchless actuators. Coordinate with access control system.

19. Types and Manufacturers:

LCN-No Substitution

Senior Swing Series 9530/9540

2.10 OVERHEAD HOLDERS AND STOPS:

A. General: Furnish surface-mounted overhead holder/stop of the type, design and function as specified here within.

1. All holders shall be non-handed and furnished complete with proper fasteners.

2. All holder arms and channels shall be made of extruded bronze or stainless steel.

3. Shock absorber to be a shock absorbing coil steel spring with a rubber insert.

4. Furnish sex bolts on all wood doors.

B. All products herewith shall comply with the standards of ANSI/BHMA A.156.8.

C. Types and Manufacturers:

Glynn-Johnson

450$	4420
450F	4430
450H	4410
90H	9000H

2.11 ELECTRO-MAGNETIC DOOR RELEASE:

A. General: Furnish electromagnets hold open devices designed specifically to hold fire and smoke doors open until released under activation of the fire alarm system or loss of power.

1. Faceplates shall be stainless steel for flush or surface mounting and shall fit into standard single gang electrical boxes.

2. Assembly shall consist of an armature contact plate with adjustable pivot mounting.

3. All units to be equipped with easy wire quick insert connectors.

4. Holding force to be 25 pounds, voltage to be 24VDC, unless otherwise approved by the Architect.

5. Types and Manufacturers:

LCN	Rixon
SEM7840	FM998

NOTE: ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING, JUNCTION BOXES, CONDUIT, RECIFIERS, TRANSFORMERS ETC., INCLUDING ALL CONNECTIONS AS REQUIRED TO PROVIDE A COMPLETE OPERATIONAL SYSTEM UNDER DIVISION 16/DIVISION 28.

2.12 PUSH/PULL PLATES:

A. General: Push plates and pull plates shall be provided as scheduled.

B. All plates shall be drilled and countersunk approximately 6" on centers. All plates shall be furnished with stainless steel Phillip's head screws with undercut heads to Insure a tight bond on any type of door. All plates shall be packaged in individual envelopes, clearly marked and sized. All material shall be properly packaged to protect the finish.

C. All products shall comply with ANSI/BHMA standards A156.6 and A156.18.

D. All push and pull plates shall have radius corners.

E. All push plates shall be a minimum thickness .125.

F. All pull plates shall be a minimum thickness .050.

G. Types and Manufacturers:

Ives	Rockwood	Hager
82004"x16"	73 RC, 4x16	90R,4 X16
8302 4"x16"	107 X 70RC, 4X16	43G, 4x16

2.13 KICK AND ARMOR PLATES:

A. General: All kick plates and armor plates shall be .050 inch minimum thickness stainless steel, US32D. Plates to be beveled three edges (B3E), drilled and countersunk with stainless steel screws 5/8" minimum with matching finish.

B. All plates shall be in compliance with ANSI/BHMA standards A156.6 and A156.18.

C. Types and Manufacturers:

Ives	Rockwood	Hager
8400 Serles	K1050 Serles	193S

2.14 MANUAL FLUSH BOLTS AND COORDINATORS:

A. General: All flush bolts are to be manually operated and furnished for pairs of doors as specified. Furnish minimum length of 12" for all rods, except where any door is higher than 7'-0", furnish the top bolt in a length sufficient to locate the flush bolt operator no more than 6'-0" above the finished floor. Comply with ANSI A115.4, door and frame preparation and ANSI/BHMA A156.16. Furnish standard strikes with wrought boxes for top bolts. Furnish dustproof strikes for bottom bolts. Coordinators are to be used only on hollow metal doors.

B. Types and Manufacturers:

Ives	Rockwood	Hager
FB458	555	282D
FB41P/42	1942	291D
CORxFLxMB1/2	1600xFillerxMtg. Brkt.	297Dx297Fx297M/N
FB31P/32	1842	292D
FB358	557	283D

2.15 DUSTPROOF STRIKES:

A. Dustproof Floor Strikes: For 5/8" round or 1/2" square bolts.

1. Ives: DP1/2
2. Rockwood: 570
3. Hager: 280X

2.16 FLOOR AND WALL STOPS:

A. General: Furnish floor and/or wall stops as indicated, unless otherwise specified.

Ives	Rockwood	Hager
WS406CCV	410	236W
FS436	440	241F
FS441	471	257F
FS495	494	326W
FS496	491	326F

2.17 THRESHOLDS:

A. General: Furnish thresholds of the type, finish and material as specified.

B. Fasteners shall be of stainless steel or non-ferrous material with a finish compatible with the threshold. The length of the screw used should be the proper length to allow for a minimum of 3/4" thread engagement in the floor or anchoring device used.

C. All material shall be Incompliance with ANSI/BHMA standards A156.21.

D. All aluminum extrusions are to be of alloy 6063 hardness T-5.

E. Types and Manufacturers:

National Guard	Pemko	
513	1665A	413S
896S	2005	520S
950S	2001	477S

2.18 WEATHER STRIPPING/GASKETING:

A. General: Furnish all weather stripping, gasketing, door bottoms and astragals as specified.

B. Wherever the specified materials are used in conjunction with a fire rated opening, products shall have been tested in accordance with the Underwriters Laboratories, UL10C and shall meet the requirements of positive pressure USC 7- 2.

C. All gasketing material shall be silicone and in compliance with ANSI/BHMA standard A156.22 for door gasketing systems.

D. Types and Manufacturers:

	National Guard	Pemko	Hager
Gasketing	107S	379S	864S
Gasketing	155S	303AS	891S
Gasketing	9090	PK55	
Door Sweep	C627A	3452CP	770SB
Door Sweep	C607A	18062CP	802S
Astragal	158SA	355 CS	859S
Astragal	109SA	375CR	874S
Astragal	9115A		

2.19 DOOR SILENCERS:

A. Furnish for all hollow metal frames, three door silencers for each single door and two each for each pair of doors as manufactured by one of the following manufacturers.

1. Ives:
2. Rockwood:
3. Hager:

SR64 608
307D

2.20 KEY CONTROL SYSTEM:

A. General: Furnish a complete key system of the type specified.

B. Provide key cabinet made of cold rolled, minimum 18-gauge furniture steel electro-welded. Doors shall have continuous brass pin piano type hinge and shall be equipped with chrome-plated locking handles, hook cam and two paracentric keys. All locks shall be nickel plated with solid brass pin tumbler cylinder keyed as directed. Key cabinet and key control system shall accommodate all keys for this project plus fifty percent expansion.

1. Key tags shall consist of two sets: Permanent self-locking and loan key snap hook type with tag colors as follows: Red fiber markers of the permanent

self-locking type approximately 1·1/4" inch in diameter on, which shall be engraved the legend, "File Key Must Not Be Loaned."

2. Also furnish for each hook a white cloverleaf key marker with snap hooks on which shall be engraved "Loan Key."

C. The hardware supplier shall attach a key tag to each change key and shall mark thereon the respective architectural key symbol and key bitting number. Each group of keys shall be contained in a key gathering envelope, which shall Include the architectural key symbol, key bitting number and architectural room description number.

The hardware supplier shall be responsible for properly identifying and tagging all change keys, setting up the key cabinet and key Index system.

The General Contractor shall be responsible for verifying that all locksets are Installed In their proper location and that the key changes operate the correct locks.

1. Key Index System Shall Include:

a. Hook number
b. Architectural key symbol
c. Archltectural door number
d. Owner's revised room number
e. Key bitting number

D. The hardware supplier shall Include In their scope of work all labor necessary to completely layout the key index system and install all keys, properly Identified In the key cabinet. The permanent keys and key cabinet shall be delivered directly to the Owner.

E. The key cabinet shall be a three-way cross Index system and shall include a hardbound copy and disk, including master key listing the keys alphabetically, the hooks numerically and the key bitting changes numerically. Attach the keys to the two sets of numbered tags supplied with the cabinet, permanent tag and the loan key tags. The supplier shall Instruct the Owner in use of the system. The General Contractor shall install the cabinet in a location selected by the Owner.

F. Type and Manufacturers:

1. Telkee Aristocrat AWC-450-S System

Size of system is minimum requirement, appropriate size to be furnished dependent on project.

2.21 KEYS AND KEYING:

A. Provide Best brass construction cores and keys during the construction period. Plastic construction cores will not be permitted. Construction cores shall not be part of the Owner's permanent keying system or furnished on the same keyway or key section as the owner's permanent keying system.

B. Permanent Best cores and keys shall be prepared according to the approved keying schedule and shall be furnished to the Owner by the local Best factory representative prior to occupancy.

C. All cylinders and cores shall be Best 7-pin, interchangeable core. Furnish Best "Premium" cores at all exterior keyed openings. Best cores shall be keyed by the factory to match the existing Frederick County Public School key system.

D. Permanent Best keys and cores shall be 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 "Duplication Prohibited."

E. Grand Master keys, Master keys and other Security keys shall be transmitted to the Owner by Registered Mail, return receipt requested.

F. Furnish keys in the following quantities:
1. 4 each Grand Master keys
2. 4 each Master keys per set
3. 4 each Change keys each keyed core
4. 9 each Construction Master keys
5. 1 each Construction Control key

G. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Contractor's Hardware Supplier. All Construction cores and keys remain the property of the Contractor's Hardware Supplier.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL:

A. The Contractor shall receive all hardware for doors as shown and scheduled and as in accordance with the approved hardware schedule.

B. Provide an adequate and secured storage area for all hardware; refer to paragraph 1.09.

C. Install all hardware in strict accordance with the manufacturer's templates and Installation procedures and workmanship, refer to paragraph 1.03.

D. The Contractor shall turn over to the Owner any tools supplied with the hardware to adjust or maintain the hardware.

E. In conjunction with the hardware supplier, the Contractor shall adjust and check the installation of hardware prior to acceptance by the Owner and/or Architect.

F. The Contractor shall obtain a copy of ANSI/DHI A115.IG-1994. "Installation Guide for Doors and Hardware." It is the intent of this document to be used

as a reference guide in the proper handling, storage and installation of finish hardware and doors and frames. This document can be obtained through the Door and Hardware Institute, Chantilly, VA.

G. All hardware shall be inspected by the factory representative prior to final acceptance by FCPS to ensure proper installation and adjustment. The representative shall submit a written report to the Architect with copies to the Contractor and hardware supplier upon completion of his service. This report shall Include any installation problems, noting door numbers and location along with recommendations to correct the problem.

H. The Contractor and construction manager shall coordinate a pre-installation meeting with the hardware installers, the hardware supplier, and manufacturers' representative to review products specified and their proper Installation.

3.2 Electronic Access Control System Requirements:

A. Summary of Work: The hardware supplier shall obtain the services of Best Access Systems to furnish and install the hardwire Electronic Access Control System (EAC) under this Section. The EAC system shall be tied into Frederick County Public Schools (FCPS) existing BASIS Access Control Software System. Through the hardware supplier, BEST shall furnish all labor, material and services necessary to install a complete EAC system. Note, regardless of door and frame material, the EAC system shall be included in the hardware supplier scope of work. No deviations will be allowed. Card Readers shall be provided at the doors indicated in the attached hardware schedule.

B. Access Control System Equipment Requirements:

Furnish the following equipment:

1. One (1) Intelligent System Controller/ Network Device/ Communication Cable & Enclosure # BAS-2220 x LS-MSS100-1 x HOC-ETHLAN.
2. Minimum of five (5) Magnetic Card Access Reader BAS-2005W (Black) per school.
3. Minimum of three (3) Dual Reader Interface Module BAS-1320 per school.
4. Minimum of one (1) "UL" listed Power Supplies & Enclosure BAS·AL600ULM x ABT-12 per School.
5. Wiring requirements are 18 gauge, 4 paired, (8 wire) twisted, shield, plenum rated "UL" listed. Note: Wire shall be provided and installed by BEST. The Electrical Contractor shall provide conduct as required, under Division 16.

Note equipment shall be configured and engineered to suit overall system requirements above quantities may vary.

C. Hardware Requirements and Door Application:

At exterior (double or single) doors requiring exit devices, furnish fall secure quiet electric latch retraction exit devices (QEL), power supply, and power transfer hinge (EPT-10). At non-egress (single) exterior door furnish cylindrical lockset with fall secure electric strike (6211). All electrified hardware shall be interfaced with the EAC system, and be connected to the emergency generator. Regardless of door and frame material, electrified hardware shall be Included in the hardware supplier scope of work.

Example 1 Double doors to receive card reader will require:

2	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	MULLIION	KR4954 X 154 STABILIZERS
1	EA	PANIC HARDWARE	CD XP99EO
1	EA	PANIC HARDWARE	SD QELXP99EO
1	EA	RIM CYLINDER	1E72
3	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910 DT
1	EA	DOOR PULL	VR910 NL
2	EA	SURFACE CLOSER	4040XP SCNS
1	EA	CARD READER	BAS-2005 W
2	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS 904-4RL-BB-KLC

Example 2 Single door to receive card reader will require:

1	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	PANIC HARDWARE	SD QELXP99 EO
1	EA	RIM CYLINDER	1E72
1	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910NL
1	EA	SURFACE CLOSER	4040XPSCNS
1	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS904-4RL-BB-KLC
1	EA	CARD READER	BAS 2005W

D. Power and Network Requirements:

As necessary, the Electrical Contractor responsible for Division 16 shall provide switched 120V power, conduit and junction boxes at each card reader location and In the Server/Telecom room for EAC equipment. General Contractor shall be responsible for providing a network drop at the Server/Telecom room. FCPS shall provide a dedicated IP address to

BEST before EAC system start up. EAC system consisting of card reader system and electrified hardware controlled by card access shall be tied into the emergency generator back up system. In addition, provide battery back up at Main Entrance door. Prior to installation, coordinate final location of card readers and access control equipment with FCPS.

E. Owner Provided:

Magnetic swipe cards shall be furnished and programmed by FCPS.

F. Submittals:

In accordance with Division 1, submit shop drawings and catalog cuts for approval.

Hardware Set Schedule:

Set #1 BASE BID – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum entrance doors in storefront framing. Each to have:

BASE BID Function – Manual egress hardware with (egress only) function and keyed access. Electronic access control not included.

2	Continuous Hinges – Hagar Roton 780-224HD	Clear
2	Rim Exit Device – Von Duprin CDSI-99EO	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
3	Mortise Cylinders – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	

Set #1A ADD ALT #1A – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to have:

ADD ALT #1A Function – Access controlled egress hardware with (egress only) function and keyed access. Electric latch retraction interlocked with existing timeclock on class change schedule.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99EO With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
1	Mortise Cylinder – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #1B ADD ALT #1B – Cross Corridor Doors 1/101 and 2/101 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to have:

ADD ALT #1B Function – Access controlled egress hardware with (egress only) function and keyed access. Electric latch retraction interlocked with existing timeclock on class change schedule AND activated by card reader.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99EO With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
1	Mortise Cylinder – Best	626

2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #2 – Door 1/102 consisting of single 3’-0”x7’-0” aluminum entrance door in storefront framing.

Function – Access controlled egress hardware with electric strike activated by remote desk station and card reader.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Storeroom Lockset – Best 9K37-15-D	626
1	Electric Strike – Von Duprin 6400	US32D
1	Surface Closer – LCN 4040XP	689
1	Mounting Plate	689
1	Wall Stop	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Remote desk station	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #3 – Door 2/102 consisting of single 3’-0”x7’-0” aluminum entrance door in storefront framing.

Function – Manual egress hardware and lockset. Electronic access control not included.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Cylindrical Lockset – Best 9K37-15-AB	626
1	Surface Closer - LCN 4040XP	689
1	Mounting Plate	689
1	Wall Stop	

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes glass and glazing.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

1.2 STANDARDS

A. As required by Safety Glazing Materials regulations and agencies having jurisdiction, provide safety glass manufactured, tested, permanently labeled and installed per these requirements.

1.3 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

B. Copies of the shop drawings, after being certified by the contractor and approved by the Architect, shall be requested by the glazier through channels for the purpose of ordering the glass and expediting its delivery.

C. Samples: Submit, when notified for the Architect's inspection and approval, samples of the types of glass specified. Sample shall be at least 4 inches wide by 9 inches long in required thickness.

1.4 WARRANTIES, GUARANTEES, TESTING

A. Warranty: All insulating glass shall be a banded type and carry a 10-year warranty by the manufacturer that under normal conditions, material obstruction of vision resulting from film formation or dust collection between the interior glass surfaces of the double-insulating glass will not occur.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Glass: Glass shall bear the manufacturer's original label for each piece manufactured by the American-Saint Gobain, Libbey-Owens Ford Glass Company, PPG, Guardian or equal as approved by the Architect.

B. Clear glass shall be transparent flat glass that meets the requirements and tolerances of ASTM C-1036.

C. Glass products shall be tempered for use in doors, entranceways, or other high traffic density areas or in hazardous locations as defined in the U.S. Consumer Product Safety Commission Standard 16 CFR 1201 C1 and C11, or for fixed glazed panels as defined in state glazing laws or building codes.

D. Glazing Compound: Glazing compound shall be the product of Pecora, Tremco, or equal as approved by the Architect, in color matching frames as closely as possible.

2.2 SIZES

A. Glass shall conform to manufacturer's standards for maximum size for each type of glass. All tempered glass and double-insulating glass panels shall be ordered from exact sizes given on shop drawings or from field measurements. Lights that are narrower than they are high shall be cut to order to obtain the best viewing.

2.3 GLASS TYPES

A. Safety Glass (Type G-3) (interior glazing): Clear tempered, 1/4” thick, ANSI Z97.1, Federal Standard 16 CFR 1201 Category I and Category II, with label clearly visible after glazing. This type includes laminated glass as required by the standards referenced above and IBC 2012 Chapter 24 Section 6.

B. Sealant: Elastic non-hardening glazing sealant, recommended by glazing manufacturer.

C. Setting Blocks: Neoprene, hardness: 70 to 80 Shore A Durometer, generally 1/8” wider than materials to be glazed and minimum 4” long, 1/8” thick.

PART 3 EXECUTION

3.1 INSTALLATION

A. Glazing Standards: Applicable requirements of the Glazing Manual of Flat Glass Marketing Association (FGMA), 3310 Harrison, Topeka, Kansas, 66611 latest edition are hereby made a part of these specifications.

B. Glazing shall not be done when the temperatures are below 40 degrees Fahrenheit. When circumstances require the glazing below 45 degrees Fahrenheit, steps shall be taken to assure clean, dry and frost-free surfaces as approved by the Architect.

C. Spacers and Shims: All glass to be set with 3/32 inch x 1/4 inch x 3 inch spacers, positioned on 24 inch centers on fixed and removable stops made of 40-70 shore hardness rubber or neoprene setting blocks, 1/4 inch x 1 inch x 4 inches long or 1/4 inch x 5/8 inch x 4 inches long, as required by FGJA Standards for installing glass at quarter points.

D. Channel Glazing: All glass to be set with a minimum of 1/8 inch spacers on both sides of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with one part acrylic sealant at heel finished with architectural glazing compound or vision strip.

E. Face Glazing: All glass to be set with a minimum of 1/8 inch spacers on rabbet side of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with architectural glazing compound.

F. Neoprene Beads: Glass in aluminum door frames and screens held by neoprene-extruded beads, snap-in type shall be inserted into stops with slight buttering at corners with channel glazing compound. Install glass per manufacturer's instructions.

G. Lights in Borrowed Lights: Glaze with metal stops as detailed. Face glaze as specified above.

3.2 CLEANING AND REPLACEMENT

A. This contractor shall properly protect all glass installed by him from injury or breakage during construction of the building. The contractor shall assume all responsibility for breakage by whomsoever caused and shall replace all cracked, broken, scratched or otherwise defective glass when directed to do so by the Architect.

B. Wash, rinse and dry glass at frequent intervals during construction in accordance with manufacturers' recommendations.

- END OF SECTION 08 80 00 -

SECTION 09 25 00
GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Requirements of the General Conditions and Supplementary Conditions apply to this Section.

B. Include all labor, materials, appliances and services necessary to complete all gypsum wallboard and related work required by the drawings and/or described in this specification.

C. Work of this Section includes repairs to existing gypsum board, located within the existing building, and preparing existing gypsum board to receive new finishes.

1.02 QUALITY ASSURANCE:

A. All work shall be in compliance with the Drywall Construction Handbook, published by United States Gypsum Company.

10.3 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

1.04 WEATHER CONDITIONS:

A. Comply with manufacturer's recommendations.

1.05 WORK BY OTHER SECTIONS:

A. Division 5 - Lightgage Metal Framing

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Gypsum Wallboard:

1. Regular: 5/8" x 4' x 8' (minimum), with tapered edges, ASTM C-36, Underwriters Laboratories Approved

2. Type X (special fire resistant): 0.625" x 4' x 8' (minimum), with tapered edges, Underwriters Laboratories Approved

B. Fasteners: 1-1/2" GWB-54 annular ringed nails or 1-1/4" drywall screws, Type W with phillips head.

C. Drywall accessories include corner and casing beads; shall be standard galvanized recessed types requiring finishing with joint treatment compound.

D. Joint Treatment System: Includes perforated tape, joint compound and topping compound.

E. Expansion Joints: USG Control Joint #093

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install gypsum wallboard and accessories in locations and positions indicated on the drawings, complying with manufacturer's installation instructions.

B. Cut wallboard by scoring and breaking, cut to fit tightly to other sheets of wallboard and around penetrations and protrusions. Joints shall fall on the centers of supporting members. Install with nails at 8" centers or screws at 16" centers.

C. Finish wallboard using 3 coats of compound 24 hours apart. Finish all dimples from fasteners and joints between sheets of wallboard. Apply dampened tape with the first coat and feather compound edges to provide a smooth and uniform surface. Sand rough areas but do not excessively roughen the wallboard paper.

D. Build fire rated assemblies in accordance with specific fire resistance classifications of the Underwriters' Laboratories.

E. Provide expansion joints as indicated on the drawings. Unless otherwise noted, provide joints to align with expansion control joints in masonry walls, concrete floor, and other building structural elements. Joints shall extend from floor to metal deck/top of gypsum wallboard above, and shall be installed aligned on both sides of all interior walls.

F. Finished surfaces shall be smooth, uniform and ready to receive decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

G. Level of Finish: Level 4 in accordance with the United States Gypsum Construction Handbook.

3.02 JOINT TREATMENT

A. Tape, fill and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

3.03 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.04 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

END OF SECTION

SECTION 09 30 60

FLOOR TILE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Ceramic floor finish using the thinset application method to patch and repair existing materials.

1.2 RELATED SECTIONS

A. Section 07900 - Joint Sealers: Mildew resistant sealant.

1.3 REFERENCES

A. ANSI A108.4 - Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile Setting Epoxy Adhesive.

B. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar or Latex Portland Cement Mortar.

C. ANSI A108.10 - Installation of Grout in Tilework.

D. ANSI A118.1 - Dry-Set Portland Cement Mortar.

E. ANSI A118.4 - Latex Portland Cement Mortar.

F. ANSI A118.6 - Ceramic Tile Grouts.

G. ANSI A137.1 - Standard Specifications for Ceramic Tile.

H. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, and setting details.

C. Product Data: Provide instructions for using adhesives and grouts.

D. Samples: Submit two (2) samples (or more if required to show color variations in tile) of all tiles and grouts for color selection by Architect.

E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

F. Submit letter of acceptance of grout and adhesive from tile manufacturer.

1.5 MAINTENANCE DATA

A. Submit under provisions of Division 1.

B. Maintenance Data: Include recommended cleaning methods, cleaning materials, stain removal methods, and polishes and waxes.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with all applicable portions of ANSI Standard Specifications for tile work.

B. Conform to TCA Handbook.

C. Maintain one copy of each document on site.

1.7 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer: Company specializing in performing the work of this section with minimum five years documented experience.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

B. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in an unventilated environment.

B. Maintain a minimum of 50 degrees F during and for 3 days after installing tile and grout.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide 8 sq ft of each size, color, and surface finish of tile specified.

PART 2 PRODUCTS

2.1 TILE MANUFACTURERS

Where attic stock for repairs is not available, provide new material to match existing size, color, and texture.
(Note: Color to match to be approved by Owner prior to installation)

A. Dal-Tile Corporation
B. American Olean
C. Royal Mosa

2.2 TILE MATERIALS

A. To match existing.

2.4 BASE MATERIALS

A. To match existing.

2.5 SETTING MATERIALS

A. Approved by Tile Manufacturer

B. Materials: Floor Tile (all new CT to be installed thinset):
1. Dry Set Mortar: ANSI A108.5 and A118.1

2. Water: Potable
3. Grout: Dry Set Grout w/latex additive: ANSI 118.6 (Color as selected by Architect)

2.6 ACCESSORIES

A. None.

2.7 GROUT MIX

A. Mix and proportion pre-mix grout materials in accordance with manufacturer's instructions and TCA Handbook.

B. Apply grout sealer to all grout joints per grout manufacturer's guidelines.

PART 3 EXECUTION

3.1 EXAMINATION

A. Inspect all surfaces upon which tile is to be applied for smoothness and cleanliness. Unsatisfactory variations (in excess of 1/4" in 8'-0" in thin set applications) shall be corrected before proceeding with the work of this Section. Surfaces shall be free of coatings, oil, wax and shall be roughened to permit scratch coat to bond. Ensure that all work by other trades is installed, imbedded and tested before proceeding with the work of this Section.

3.2 PREPARATION

A. Protect surrounding work from damage or disfiguration.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Apply conditioner to substrate surfaces in accordance with adhesive manufacturer's instructions.

3.3 INSTALLATION - THINSET METHOD

A. Install adhesive tile, thresholds and grout in accordance with manufacturer's instructions and TCA Handbook. Installation shall be per TCA F113 for all thinset tile floors over concrete.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Place thresholds at exposed tile edges. Install thresholds using same method as floor tile.

D. Cut and fit tile tight to penetrations through tile. Form corners and bases neatly. Align floor, base and wall joints.

E. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

F. Sound tile after setting. Replace hollow sounding units.

G. Allow tile to set for a minimum of 48 hours prior to grouting.

H. Apply grout, strike and tool joints and cure in accordance with grout manufacturer's instructions. Damp cure as specified in TCA Detail requirements.

I. Lay out tile work accurately, symmetrically and perpendicular and parallel to walls and floors in positions and locations indicated on the drawings. Lay tiles so that generally no

tiles less than half sizes will occur. Fit tile closely around the work of other trades, slope floors uniformly to drains.

J. Lay out tile work so that joints are centered over control/expansion joints in substrates. Space tile accordingly, so that no tile will be cut between these joints. Unless otherwise noted provide expansion joints in tile, in accordance with TCA details, at each column line, and/or at 16' on center in each dimension.

3.4 CLEANING

A. Clean tile and grout surfaces, acid cleaners not permitted. Wash tile with clear water after the grout has stiffened. Clean with damp cloths and wet vac to remove all grout residue.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished Work with non-staining building paper.

B. Do not permit traffic over finished floor surface for 4 days after installation.

- END OF SECTION 09 30 60 -

SECTION 09 51 10

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system and perimeter trim as indicated on the drawings and as required to patch and repair existing materials.

B. Mineral fiber acoustical ceiling tile units.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. ASTM E1264 - Classification of Acoustical Ceiling Products.

C. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

1.4 SYSTEM DESCRIPTION

A. Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on metal grid system components and acoustical units.

C. Product Data: Submit data on acoustical wall treatment.

D. Samples: Submit two samples 6 x 6 inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner and edge trim.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.7 QUALIFICATIONS

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C) and maximum humidity of 40 percent prior to, during and after acoustical unit installation.

1.9 SEQUENCING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustical units after interior wet work is dry.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide 2 percent of total acoustical unit area of extra panels to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong World Industries, Prelude System

B. Chicago Metallic, 200 Series

C. Equal product by CertainTeed

2.2 SUSPENSION SYSTEM MATERIALS

A. Non-fire Rated Grid: ASTM C635, intermediate duty, exposed T components die cut and interlocking.

B. Grid Materials: Commercial quality cold rolled steel with galvanized coating, minimum 25% recycled content.

C. Exposed Grid Surface Width: 15/16 inch.

D. Grid Finish: Baked Polyester Paint, color to be White.

E. Accessories: Stabilizer bars, clips, splices, edge moldings, hold down clips and as required for suspended grid system.

F. Support Channels and Hangers: Primed steel; size and type to suit application and ceiling system flatness requirement specified.

2.3 MANUFACTURERS - ACOUSTICAL UNITS

A. Armstrong World Industries (used as the standard of quality, listed model numbers)

B. Equal product by Chicago Metallic

C. Equal product by CertainTeed

2.4 ACOUSTICAL UNIT MATERIALS

A. Acoustical Ceiling Panels (Size See finish schedule for location of each type of tile):

1. ACT -1 to be 24 X 48 inches, Armstrong Fine Fissured, (to match existing ACT in lobby and corridor),

2. Thickness: 3/4 inches

3. Composition: Wet formed mineral fiber, minimum 35% recycled content, no added formaldehyde.

4. NRC Range: .70

5. CAC Range: 35

6. Fire Hazard Classification: Class A, Flame Spread less than 25

7. Edge: Square

8. Surface Color: White

9. Surface Finish: Factory applied

2.5 ACCESSORIES

A. Touch-up Paint: Type and color to match acoustical tile and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that layout of hangers will not interfere with other work. Confirm starting lines for layout with Architect.

3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C-636 and manufacturer's instructions and as supplemented in this section.

B. Intermediate - duty grid: Comply with ASTM C-636, suspension requirements of ASTM C-635, intermediate-duty systems, and manufacturer's installation instructions.

C. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

D. Locate system on room axis according to reflected plan.

E. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

K. Form expansion joints as detailed. Maintain visual closure.

3.3 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Install units after above ceiling work is complete.

D. Install acoustical units level, in uniform plane, and free from twist, warp and dents.

E. Cut panels to fit irregular grid and perimeter edge trim.

F. Where bullnose concrete block corners occur, provide preformed closers to match edge molding.

G. Install hold-down clips to retain panels tight to grid system within 20 ft of all exterior doors.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 STOCK MATERIALS

A. At the end of the project, provide 2% of the acoustical tile for each size, type and pattern installed. Extra stock to be turned over to the owner.

- END OF SECTION 09 51 10 -

SECTION 09 65 19

RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient tile flooring, including vinyl composition tile. Installation requires matching existing tile in multiple locations.

B. Rubber base.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. ASTM F1066 - Vinyl Composition Floor Tile.

C. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Samples: Submit two sets of samples illustrating color and pattern for vinyl tile, rubber tile, rubber base and reducing/trim strips for color selection by the Architect.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/smoke rating requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.8 MAINTENANCE DATA

A. Submit under provisions of applicable Division 1 sections.

B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.9 EXTRA MATERIALS

A. Furnish under provisions of Section 01700.

B. Provide one box of each type of tile per 50 boxes of tile per color/pattern used, 10 lineal feet of base for every 500 linear feet installed, and four external base corners.

1.10WARRANTY

A. Provide manufacturer's standard 5-year warranty on all tile flooring products.

PART 2 PRODUCTS

2.1 MATERIALS – VINYL TILE FLOORING

A. Vinyl Composition Tile: ASTM F1066 and SS-T-312 BC, Type IV

1. Size: 12 x 12 inch – to match existing
2. Thickness: 1/8 inch – to match existing
3. Design: marbleized – to match existing
4. Manufacturers:
   a. Armstrong, Style - Standard Excelon Imperial Textured
   b. Azrock, Style - Custom Cortina
   c. Tarkett, Style - Expressions
   d. Mannington - L
5. Pattern: Varies – to match existing
6. Color: Varies – to match existing

2.2 MATERIALS – RUBBER BASE

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite

2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.3 MATERIALS – SHEET VINYL

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite
2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.5 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Edge (transition) Strips: Flooring material manufactured by Mercer, Johnsonite, or equal, color to match vinyl base color adjacent to strip.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify concrete floors are dry to a maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization or dusting.

B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

3.3 INSTALLATION - TILE FLOORING

A. Install in accordance with manufacturer's instructions. See drawings for patterns.

B. Mix tile from container to ensure shade variations are consistent when tile is placed.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

F. Install tile to turn block pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

H. Install resilient edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

J. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Vinyl Composition and Rubber Flooring

1. Stripping

a. Strip floor using a slow speed floor machine and green stripping pad. Use Freedom, Bravo or Step-Off stripping products only.

b. Rinse floor at least twice with clean water and let dry. Use wet-vac to remove stripping solution and water.

2. Apply Finish

a. Apply five coats (2,000 to 2.500 SF/gal) of Carefree with clean, pre-rinsed rayon mop, allowing 1 hour minimum dry time between coats. Allow final coat to dry 24 hours before allowing traffic on finished floor.

3.6 PROTECTION OF FINISHED WORK

A. Protect finished Work. Entire floor to be protected with red rosin paper, taped.

B. Prohibit traffic on floor finish for 48 hours after installation.

- END OF SECTION 09 65 19 -

SECTION 09 90 00

COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes:

1. Paint or natural finish all interior surfaces not specifically excluded. Includes:

a. All areas indicated on the drawings and included in the schedule noted to be painted.
b. Areas of patch and repair of existing painted components.

B. Exclusions: In addition to material obviously not requiring paint such as stainless steel, plastic laminate, glass, flooring, tile, etc. Do not paint or finish:

1. Surfaces indicated by finish schedule to remain unfinished.

2. Factory finished surfaces indicated to be factory finished.

a. Aluminum with anodized or baked-on finish.
b. Finish hardware, except hardware with USP finish.
c. Electrical devices, fixtures, and trim.

3. Equipment such as mechanical, and electrical equipment located inside equipment rooms.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.

B. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

C. OTC-Regulation No.41

D. SSPC-SP 1 - Solvent Cleaning

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Indoor Air Quality: Provide products which will not adversely affect indoor air quality through emission of toxic gasses or vapors. Do not use materials with residual of formaldehyde, epoxy resin, or urea-based materials.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on all finishing products and special coatings.

C. Samples: Submit two samples, 6 x 6 inch in size illustrating selected colors and textures for each color selected. Wood stains shall be applied to actual piece of trim material.

D. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention.

E. Verify in writing that the products specified will be used as directed or submit for approval a list of comparable materials of another listed approved manufacturer, including full identification of all products by name, color and catalogue number adjacent to those specified, with a statement of equality by the proposed manufacturer.

F. Submit Manufacturer’s certification (MSDS Sheet) for each paint and coating highlighting VOC limits and chemical component limits.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.

B. Applicator: Company specializing in performing the work of this section with minimum five (5) years experience and approved by manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for finishes.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, VOC content, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions. Storage space shall be designated by the Contractor and approved by the Architect.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

1.10 EXTRA MATERIALS

A. Provide 1 gallon of each color and surface texture to Owner at the completion of the project.

B. Contractor shall label each container with color, type, texture, and room locations in addition to the manufacturer's label. Contractor shall also provide detailed listing by room of color, type, and texture along with manufacturer's name and identification number.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer's: Best quality materials as manufactured by one of following manufacturers will be acceptable:

1. For Brush, Roller or Spray work:

a. Sherwin Williams
b. Benjamin Moore
c. Pittsburgh Paints

B. Quality: All products not specified by name shall be "best grade" or "first line" products of acceptable manufacturers. See Part 3- Execution for materials required for this project. Where possible, provide materials of single manufacturer.

2.2 MATERIALS

A. Coatings: Ready mixed. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.3 FINISHES

A. Refer to schedule at end of section for surface finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application to the Architect and General Contractor.

C. Test shop applied primer for compatibility with subsequent cover materials.

D. Allow masonry work to cure for at least 30 days before coating. Gypsum board shall be allowed to dry for 15 days before coating.

3.2 PREPARATION

A. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Seal with shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

F. Galvanized Surfaces: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.

J. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

G. Allow applied coat to dry before next coat is applied.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Divisions 15 and 16 for schedule of color coding and identification banding of equipment, duct work, piping, and conduit.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names and numbering.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

J. Finished work is to be adequately covered with uniform color and finish. The number of coats herein specified being a minimum, this contract shall provide any additional coats to produce a first-class job. Architect may select accent colors or deeptone colors (contrasting bright colors) for interior painted walls or ceilings. Where bright colors are selected, apply extra coats of paint where required to obtain completely opaque surface. Make allowances for 10 percent deep tones in bid. Additional labor or materials used for this purpose not allowable as extra cost.

K. Objects on Roof: Paint all metal objects on roof including, but not limited to, rooftop mechanical units, flashings, roof drains, vents, exhaust fans, air intake hoods, roof hatches, etc. as specified under ferrous, zinc coated metals.

L. Allow the following minimum drying time between coats:

1. Exterior work-48 hours.

2. Interior work-24 hours.

3.5 PROTECTION AND CLEANING

A. Protection: Protect floors and adjacent surfaces from paint smears, spatters and droppings.

1. Cover fixtures not to be painted. Mask off areas as required.

2. Finish Hardware: Ensure hardware is removed prior to starting painting operations and that it is replaced only after painting operations have been completed.

a. Hardware Removal and Replacement: Section 08710.

B. Damage to Other Work: Be responsible for damage done to adjacent work. Repair damaged work to satisfaction of Architect. Replace materials damaged to extent that they cannot be restored to their original condition.

3.6 SCHEDULE OF COATINGS

A. Interior:

Surface	Area	Type, Luster & Coats
1. Gypsum Board	New/Exist. ceilings, walls, and bulkheads	1 coat: S-W Harmony Low Odor Interior Latex Primer, B11W900 (4 mils wet, 1.3 mils dry per coat) 2 coats: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series or S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series. (4 mils wet, 1.6 mils dry per coat)

- END OF SECTION 09 90 00 -

SECTION 220499
PLUMBING SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The work to be performed under these Specifications shall include providing all labor, materials, and equipment necessary to furnish and install, complete, properly, and fully all plumbing work as shown on the Drawings or herein specified. It is the intent of these Specifications that a complete operating system be installed; this Contractor shall carefully examine the site, drawings, and Specifications, and shall include all items necessary to accomplish this purpose. The work, in general, shall include, but shall not be limited to the following:

1. **Provide revised wet fire protection systems for areas indicated on Architectural Plan.**

1.3 WORK BY OTHER TRADES

A. Cutting, patching, painting, electrical, revised **fire protection,** etc., shall be done by the affected trade at this Contractor's expense for changes required in work already installed or work required by other trades for changes made by this Contractor in type or size of equipment purchased.

1.4 WORK NOT INCLUDED

A. The following construction and equipment related to the work under this Contract will be provided by others:

1. Openings in new exterior walls. (General Contractor)

2. **Revised building fire protection system. (Separate Fire Protection Contract)**

PART 2 – PRODUCTS

2.1 NOT APPLICABLE TO THIS SECTION

PART 3 – EXECUTION

3.1 NOT APPLICABLE TO THIS SECTION

END OF SECTION 220499

SECTION 221420
WET – PIPE FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. All fire protection system work shall be completed by a licensed, certified, Fire Protection Contractor acting as a subcontractor to the Plumbing Contractor. All work shall be directly coordinated with the local Fire Department.

C. The Plumbing Contractor shall furnish and install a flanged connection at interior water service entrance for beginning the Fire Protection Subcontractor's work. Final connections to flange will be completed by the Fire Protection Subcontractor.

D. All pipe materials shall be subject to the acceptability of that material with the prevailing local fire and plumbing codes, NFPA 13.

E. The Drawings and Specifications for this project are generally schematic and are intended for bidding purposes only **and are not intended to cover each item required for a total system as outlined in NFPA 13.** The minimum spacing, quantity and arrangement of proposed sprinkler locations, equipment, piping, and standpipes indicated on the Drawings generally are diagrammatic. The exact arrangement, sizes, quantity and spacing required by the agencies having jurisdiction shall be indicated on the Working Drawings that are to be prepared by the Contractor.

1.3 SCOPE

A. The revised fire protection work to be performed shall include the following, but not necessarily limited to:

1. Furnish and install Contractor-hydraulically designed revised wet fire protection systems, including all required drain piping and accessories, complete in every detail.

2. Directly after award of Contract, regardless of dates of existing flow tests; or flow test data obtained or shown on any drawings; and prior to any submittal, the Contractor shall be responsible for conducting and obtaining new flow test data. Obtain water flow, pressure, capacity data, elevations, and other related pertinent information from the nearest available fire hydrant(s), and as arranged with the Water Authority serving the building. Arrange any times and dates with the Water Authority. Water flow test data obtained from the Water Authority will not be acceptable, regardless of when such flow tests were performed. Include all costs involved with obtaining the flow test data, including the use of special tools, equipment, and accessories and include in the Contract Bid. Typed copies of confirmed flow test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

3. Directly after award of Contract, the Contractor shall obtain and confirm latest test data performed on the existing fire pump system. Existing test data shall be obtained from the Owner of the building and must have been performed within the last twelve (12) months of the Contract Bid Date. If later than twelve (12) months, the Contractor shall perform

the necessary fire pump system tests to obtain this data. Include all costs involved with conducting the pump test and include in the Contract Bid. Scheduling of the fire pump system tests shall be directly coordinated with the Owner and the local Fire Department. Typed copies of fire pump test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

4. Include all tests, permits, and fees, including all costs involved.

5. Contractor shall complete all Contractor's Material and Test Certificates for above ground installations.

1.4 CODE COMPLIANCE

A. All fire protection work and materials herein described shall comply with all applicable federal, state, county, health, and local laws, ordinances, rules and regulations, and all other local authorities having jurisdiction and shall be subject to the approval of these authorities, notwithstanding anything in these specifications to the contrary. In addition, all work and materials to be provided under this Section of the Specification shall conform to the applicable requirements of the National Board of Fire Underwriters Standards, and the National Fire Protection Association Standards; special reference is made to NFPA 13, Standard for the Installation of Sprinkler Systems, Standard for the Installation of Standpipe and Hose Systems. All threads shall conform to the local Fire Department Standards; confirm prior to ordering.

1.5 SHOP DRAWINGS

A. Product Data: Submit manufacturer's technical product data and installation instructions for all fire protection materials and products.

B. Approval Drawings: All fees for this approval shall be by this Contractor. Prepare approval drawings of the fire protection systems coordinated with other mechanical, electrical, structural and general building drawings, of the fire protection systems proposed by the Plumbing Contractor and submit prints of the drawings to the appropriate governmental, health, and underwriting agencies for their review and approval. Prints bearing the approval stamp of the Underwriting Agency, authorized Fire Marshal and other Authorities having jurisdiction shall be submitted to the Architect prior to the commencement of any fabrication or installation of any portion of the system. The drawings shall include all of the following information and whatever additional information that may be required by the authority having jurisdiction.

1. All sets of drawings with appropriate NFPA standards listed.

2. System type.

3. Total number of risers.

4. Sprinkler spacing and locations with dimensions showing all lighting fixtures, diffusers and return air grilles.

5. Occupancy type.

6. Hazard classification.

7. Hangers, types and details.

8. Temperature and type of sprinkler heads.

9. Sprinkler system accessories.

C. Approval Calculations: Prepare hydraulic calculations of fire protection systems to determine all pipe sizes. Submit to Agency having jurisdiction for approval. Submit one approved copy, bearing stamp and/or signature of Agency having jurisdiction to the Architect before proceeding with the installation.

D. Certificate of Installation: Submit certificates upon completion of fire protection work which indicates that work has been installed and tested in accordance with NFPA 13, and also that the system is operational, complete and has no defects.

E. Record Drawings: At project closeout, submit record as-built drawings of installed fire protection piping and products.

F. Maintenance Data: Submit maintenance data and parts lists for fire protection materials and products. Include this data, product data, shop drawings, approval drawings, approval calculations, certificate of installation and record drawings in maintenance manual.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION PIPING INSIDE BUILDING

A. Pipe:

1. All wet system piping herein specified shall be UL Listed and FM Approved. Pipe shall be as manufactured by Allied Tube & Conduit, Youngstown Tube Co., or Wheatland Tube Company. For the wet-pipe systems only, all piping that utilizes threaded fittings shall be Schedule 40 black steel. “Plain-end” pipe/fittings and threadable light-wall pipe are not permitted. Sprinkler piping 1-1/4” in diameter or larger, connected by welded, flanged fittings or roll grooved fittings, shall be Schedule 40 or Schedule 10 as permitted by NFPA 13. Cut grooves are not permitted. All sprinkler piping 2” in diameter and smaller (that is not roll grooved or welded) shall be Schedule 40 utilizing screwed fittings (plain end fittings will not be accepted). All miscellaneous drain and test piping and fittings shall be Schedule 40, internally and externally galvanized. All piping shall include factory coating of the inner wall of piping, to guard against MIC (microbiologically influenced corrosion). The coating shall adhere to the wall of the pipe, thereby providing protection against contamination and pipe deterioration by impeding the attachment of microbes to the pipe wall.

   a. Where piping is exposed it shall be steel pipe, as specified herein.

2. Instead of hard-pipe armovers above ceiling areas, the Contractor will be permitted to use a flexible stainless-steel hose to connect sprinkler heads to the branch lines. System shall be UL Listed and FM Approved type, conforming to NFPA 13, as manufactured by FlexHead Industries, Inc., Fivalco, Inc., AquaFlex, or Gateway Tubing, Inc. Flexible hose shall be rated up to 300 psi, in 2-6 foot lengths. Each system shall be factory pressure and leak-tested. Approval on models of flexible metal sprinkler hose is limited for use in commercial suspended or sheetrock ceilings, with ceiling bracket assembly, without hangers. System shall be approved for use in suspended ceilings with light, medium, and heavy load grids (ASTM C635, C636). System will not be acceptable for exposed sprinkler system installations. System shall be installed in strict accordance with manufacturer’s installation instructions. System installation must be acceptable to the Owner and Fire Insurance Carrier.

B. Hangers for the fire protection system shall be UL Listed, FM approved. Contractor's attention is directed to "Unsupported Armover Lengths", for pipe hanger installations for pressures above and below 100 psi, in accordance with NFPA 13

C. Fittings:

1. For wet-pipe system, 150 psi, screwed malleable iron, or Victaulic FireLock ductile iron fittings and FireLock EZ ductile iron, Nibco Steelok, or Tyco couplings for grooved end piping. Grooved end fittings and couplings shall be UL Listed and FM approved and shall be the products of a single manufacturer. Grooving tools shall be supplied by the same manufacturer as the grooved components.

2. Flange adapters shall be ductile iron, flat faced, designed for incorporating flanged components with ANSI Class 125 and 150 bolt-hole patterns to a grooved piping system. Victaulic Style 741 or 744 or approved equivalent.

D. Valves shall be as manufactured by Nibco, Victaulic, or Tyco.

1. For sizes 2" and smaller, valves shall be bronze ball type, 175 pound WWP minimum, UL, FM, threaded or grooved body style, the Victaulic FireLock Series 728, or approved equivalent. The Nibco No. T-104-0, threaded, UL, FM valve, bronze gate, 175 pound WWP minimum, will be acceptable, or approved equivalent. For sizes 2-1/2" and larger, valves shall have iron body, 200 pound WWP minimum, UL, FM, with resilient wedge, flanged ends, the Nibco F-607-RW, grooved ends, Victaulic Series 771, or approved equivalent.

2. Inspector's test and drain valves shall be 175 pound WWP minimum, bronze screwed, angle, or straight globe valves, UL Listed, rubber disc, the Nibco No.'s KT-65 UL, KT-67 UL, KT-211-W-UL, or approved equivalent. The Nibco No. KT-580-70-UL and No. KT-585-70-UL, threaded, bronze ball valves, UL listed, 175 pounds WWP, will be acceptable.

3. The AGF Model 1000 Test and Drain, UL, FM approved, Victaulic Styles 720 TestMaster Alarm Test Module, or Sure-Test shall be utilized for drain systems.

E. Sprinkler Heads: All sprinkler heads shall be the product of a single manufacturer, UL Listed, and FM approved. All heads shall be the same model year and style throughout. The Architect must approve any deviations. Sprinkler heads shall be of a type, upright, pendent, or sidewall that is best suited to the conditions in which they are installed. Heads shall be as manufactured by Viking, Tyco, or Victaulic. Provide quick response sprinkler heads where required, in accordance with NFPA requirements. Heads which must be painted, shall be factory-painted only. Where required, heads shall be of a design suited to the protection of areas having irregular building design and structural arrangements such as cornices, soffits, beams and columns or building environmental systems such as light fixtures, grilles and diffusers, or building furnishings and equipment. Full consideration shall be given in the spacing of heads, of the type of head, and the arrangement of the piping to afford the protection required to be installed. Temperature ratings of all heads shall be coordinated with the NFPA 13 requirements. Provide higher temperature heads near heat – producing equipment. The Victaulic "strapless" style sprinkler heads will not be acceptable. The finish and type of sprinkler heads in finished areas must be approved by the Architect.

1. In general, sprinkler heads in finished areas with ceilings shall be fully recessed, concealed type. Heads shall include finished flat coverplate installed flush with ceiling, the Viking Mirage (QR, 5.6K, VK462), Victaulic Model V38, or approved equivalent. Finish and color of flat coverplate shall be as selected by the Architect.

2. Where indicated on the drawings, sprinkler heads shall be semi-recessed, extended coverage, chrome finish, the Viking Microfast (QR, 5.6K, VK600), or approved equivalent.

3. Use chromed heads on exposed piping or concealed piping in finished areas.

4. Sidewall heads having a bronze finish or chrome finish shall be the Viking Model M (QR, 5.6K, VK305), Victaulic Model V27, or approved equivalent.

5. Concealed horizontal sidewall sprinkler heads shall be quick response, extended coverage, UL Listed, and shall be the Viking VK630, with 14' x 26' coverage, Reliable, or Tyco.

6. In areas subject to corrosive atmosphere, heads shall be lead coated, Nickel-Teflon coated, or wax coated as required.

7. Coordinate installation of sprinkler heads with surface mounted lighting fixtures for proper clearances.

8. Install sprinklers under all ducts or obstructions greater than 48" in width in accordance with NFPA 13.

F. In accordance with UL listing requirements, protective caps or straps shall be required for all glass bulb sprinklers. The caps or straps shall be removed from the sprinklers only when the system is "placed in service", in accordance with NFPA definitions. Protective caps and straps shall be removed only using means in accordance with manufacturer's installation instructions. "Dropped" glass sprinklers, with or without protection, shall be replaced. Solder element sprinklers are not required to be protected with caps or straps.

G. Flushing: Completely flush out piping systems included under this Contract.

H. Escutcheons: All pipe escutcheons shall be chrome, cast brass, set screw type.

PART 3 - EXECUTION

3.1 SPRINKLER SYSTEM INSTALLATIONS

A. All systems shall be fully automatic, shall be complete in all detail, and shall be provided with all the required components and devices necessary to install approved systems.

B. The layout of the sprinkler system, the arrangements of the heads; and the location and size of main and branch piping shall be developed from the design requirements of the applicable sprinkler criteria and the limitations imposed by the structural and architectural design. However, the degree of protection, hence the exact spacing and arrangement of the sprinkler heads and pipe sizes in any area shall be as required by the authority having jurisdiction.

C. Rearrangement of branch piping and adjustment of the pipe sizes, where proven by hydraulic calculations and when approved by the authorities having jurisdiction, and where compatible with the building design, may be made in the preparation of the Shop Drawings.

D. In finished areas, sprinkler heads shall be uniformly spaced and patterned to suit the ceiling finishes, decorations and interferences. In unfinished areas, the pattern of spacing and the coverage shall be as determined by the shape of the space and the interferences caused by construction details and the furnishings of the space. Maximum spacing shall not exceed that

permitted by the authority having jurisdiction. Sprinkler heads in “lay-in” ceilings shall be centered in both directions.

E. Additional spare sprinkler heads of each type shall be provided to the Owner. Not less than six (6) heads or 2% of the total number of each type of head shall be furnished to the Owner for storage. Furnish and install a metal wall storage cabinet, mounted where directed by the Architect. Storage cabinet shall be as manufactured by Tyco, Victaulic, or Viking. A wrench suited to each type of head shall also be provided in the cabinet.

F. Test pipes with control valves shall be provided as required in the fire protection system.

G. Grooved joint piping systems shall be installed in accordance with the manufacturer's guidelines and recommendations. All grooved couplings, fittings, valves, and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing. A factory-trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools and installation of grooved piping products. Factory-trained representative shall periodically review the product installation. Contractor shall remove and replace any improperly installed products.

3.2 FIRE PROTECTION SYSTEM TESTS

A. Before the completed revised fire protection system is accepted by the Owner, the entire system included under this Contract shall be pressure tested by the Contractor and approved in the presence of representatives of the Owner, the Architect, local Fire Department, local authorities, the Insurance Underwriters, and any other parties directly concerned.

B. This Contractor shall furnish all labor and equipment and shall conduct and bear the cost of all required tests of the fire protection system. This Contractor shall give all concerned parties three days advance notice of scheduled tests; 48 hours to Water Authority

C. The entire fire protection system included under this Contract shall be tested under a hydrostatic pressure of not less than 200 lbs. for at least two hours, or at 50 psi in excess of the maximum static pressure when the maximum static pressure is in excess of 150 psi, or as otherwise required or directed by the local Fire Department. Testing of underground service main piping shall conform to NFPA 24 requirements. All defective work shall be promptly repaired or replaced with new pipe and fittings, etc.

D. Tests shall be repeated until the installation receives the approval of the Architect and all parties concerned.

E. Any damage resulting from the tests shall be repaired and/or damaged materials replaced, all to the satisfaction of the Architect, at the expense of this Contractor.

END OF SECTION 221420

SECTION 230500

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Piping materials and installation instructions common to most piping systems.
2. Dielectric fittings.
3. Sleeves.
4. HVAC demolition.
5. Equipment installation requirements common to equipment sections.
6. Supports and anchorages.

1.2 DEFINITIONS

A. Finished Spaces: Spaces other than mechanical and electrical equipment rooms, furred spaces, pipe and duct chases, unheated spaces immediately below roof, spaces above ceilings, unexcavated spaces, crawlspaces, and tunnels.

B. Exposed, Interior Installations: Exposed to view indoors. Examples include finished occupied spaces and mechanical equipment rooms.

C. Exposed, Exterior Installations: Exposed to view outdoors or subject to outdoor ambient temperatures and weather conditions. Examples include rooftop locations.

D. Concealed, Interior Installations: Concealed from view and protected from physical contact by building occupants. Examples include above ceilings and chases.

E. Concealed, Exterior Installations: Concealed from view and protected from weather conditions and physical contact by building occupants but subject to outdoor ambient temperatures. Examples include installations within unheated shelters.

1.3 QUALITY ASSURANCE

A. Electrical Characteristics for HVAC Equipment: Equipment of higher electrical characteristics may be furnished provided such proposed equipment is approved in writing and connecting electrical services, circuit breakers, and conduit sizes are appropriately modified. If minimum energy ratings or efficiencies are specified, equipment shall comply with requirements.

PART 2 - PRODUCTS

2.1 PIPE, TUBE, AND FITTINGS

A. Refer to individual Division 23 piping Sections for pipe, tube, and fitting materials and joining methods.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

2.2 JOINING MATERIALS

A. Refer to individual Division 23 piping Sections for special joining materials not listed below.

B. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

C. Brazing Filler Metals: AWS A5.8, BCuP Series or BAg1, unless otherwise indicated.

2.3 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Couplings: Galvanized-steel coupling with inert and noncorrosive, thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

D. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F .

2.4 SLEEVES

A. PVC Pipe: ASTM D 1785, Schedule 40.

PART 3 - EXECUTION

3.1 HVAC DEMOLITION

A. Refer to Division 01 Section "Cutting and Patching" and Division 02 Section "Selective Structure Demolition" for general demolition requirements and procedures.

B. Disconnect, demolish, and remove HVAC systems, equipment, and components indicated to be removed.

1. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
2. Equipment to Be Removed: Disconnect and cap services and remove equipment.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, remove damaged or unserviceable portions and replace with new products of equal capacity and quality.

3.2 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Install piping according to the following requirements and Division 23 Sections specifying piping systems.

B. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

C. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping to permit valve servicing.

G. Install piping at indicated slopes.

H. Install piping free of sags and bends.

I. Install fittings for changes in direction and branch connections.

J. Install piping to allow application of insulation.

K. Select system components with pressure rating equal to or greater than system operating pressure.

L. Install sleeves for pipes passing through concrete and masonry walls, gypsum-board partitions, and concrete floor and roof slabs.

M. Fire-Barrier Penetrations: Maintain indicated fire rating of walls, partitions, ceilings, and floors at pipe penetrations. Seal pipe penetrations with firestop materials. Refer to Division 07 Section "Penetration Firestopping" for materials.

N. Verify final equipment locations for roughing-in.

O. Refer to equipment specifications in other Sections of these Specifications for roughing-in requirements.

3.3 PIPING JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. Brazed Joints: Construct joints according to AWS's "Brazing Handbook," "Pipe and Tube" Chapter, using copper-phosphorus brazing filler metal complying with AWS A5.8.

F. 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 unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

3.4 PIPING CONNECTIONS

A. Make connections according to the following, unless otherwise indicated:

1. Install unions, in piping NPS 2 and smaller, adjacent to each valve and at final connection to each piece of equipment.
2. Wet Piping Systems: Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals.

3.5 EQUIPMENT INSTALLATION - COMMON REQUIREMENTS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components in exposed interior spaces, unless otherwise indicated.

C. Install HVAC equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.6 ERECTION OF METAL SUPPORTS AND ANCHORAGES

A. Cut, fit, and place miscellaneous metal supports accurately in location, alignment, and elevation to support and anchor HVAC materials and equipment.

END OF SECTION 230500

SECTION 230505

HVAC SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The Contract requirements include the providing of all labor, materials, equipment and appliances, and in performing all operations in connection with the installation of HVAC Construction Work complete for this Project, in strict accordance with this Section of the Specifications and the applicable drawings.

B. At the completion of the project, all systems shall be calibrated, tested, balanced, commissioned, and all systems shall be operating as intended.

C. Contractor is hereby bound by all applicable portions of all Contract Documents and Supplemental Specifications bound herein or included by reference.

D. In all cases where a device or part of equipment is herein referred to in the singular, such reference applies to as many such items as are required to complete the installation.

E. Provide all related and miscellaneous components or appurtenance to make all specified systems complete and functional.

F. Perform all work in accordance with work of all other contractors on this project.

G. Install work in phases during the construction period; coordinate mechanical schedule and operations with other trades and with construction schedule.

H. The work to be performed by the HVAC Contractor under these Specifications and the accompanying Drawings comprises the furnishing of all labor, materials, tools, and other services and facilities necessary for the complete installation of, but not necessarily limited to the following:

1. Demolition
    a. Remove existing unit heater including branch piping, controls, and associated accessories, as designated on drawings.
2. New
    a. Provide new hot water unit heaters as indicated.

b. Furnish combination starter/disconnects, disconnect switches, magnetic motor starters, manual motor starters and fuses to the Electrical Contractor for installation for all HVAC equipment. Coordinate all electrical requirements with the Electrical Contractor before ordering any such equipment and following review of submittals.
c. Provide all testing and balancing of all new systems. Submit balance report.

1.3 WORK BY OTHERS

A. The following construction and equipment related to the work under this Contract will be furnished or provided by others, unless noted otherwise:

1. Final painting of new interior surfaces. (General Contractor)
2. Final painting of existing interior walls, floors and ceilings where the surfaces are being refinished and remodeled under the General Contract. (General Contractor) Where the existing area is to be repainted by the General Contractor, the HVAC Contractor must repair his openings ready to paint. Refer to General Construction drawings for finishes.
3. Recesses and opening in new construction for piping and equipment. (General Contractor)
4. The removal of existing power wiring, conduit and boxes for existing removed HVAC equipment. (Electrical Contractor)
5. Furnish and installation of all line and load side power wiring to all new electrically operated HVAC equipment. (Electrical Contractor) All control and interlock wiring, both low and line voltage shall be included under the HVAC Contract as hereinafter specified for the HVAC equipment, unless noted otherwise.
6. The Electrical Contractor will be responsible for all power wiring and associated terminations to line and load side as well as mounting of all combination starter/disconnects, magnetic starters, VFD's manual starters, disconnect switches, etc. furnished by the HVAC Contractor and external to equipment they are designated to serve.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 230505

SECTION 230506

BASIC HVAC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 HVAC WORK

A. The word "building" used throughout these specifications shall be interpreted to mean the entire Building Complex.

B. The actual runs and locations of all piping equipment, etc., shall be determined at the site and shall be installed to meet the various conditions at the building. It is, however, the HVAC Contractor's responsibility to predetermine the exact locations of piping,and equipment, and to notify the other contractors accordingly to avoid confliction with other lines and equipment. Any changes necessary to conceal pipes, ductwork or clear pipes and equipment of other trades shall be made without additional expense to the Owner. This Contractor shall be responsible to create ductwork and HVAC piping coordination drawings and distribute to other contractors for coordination and sign off. Refer to Subsection 3.5 for further clarification.

C. No piping or equipment shall be installed without first obtaining sign off from the other trades. Should such installation occur and then subsequent conflicts arise, this Contractor shall, at his own expense, remove all that is in conflict and reinstall appropriately.

D. All work shall be executed and all equipment constructed and installed in accordance with the requirements of the State Building Code, the Department of Labor and Industry, ASME, Department of Environmental Resources, Department of Labor, Safety and Health Regulations for Construction, OSHA, National Fire Protection Association, the National Electrical Code as amended to date of bidding, and all federal, state, county and local ordinances and regulations. Nothing contained in these specifications or shown on the drawings shall be construed to conflict with the aforesaid codes, ordinances, or regulations. Certificates of approval shall be obtained from any department issuing same, and shall be turned over to the Owner at the completion of the work. All fees and permits required shall be satisfied and obtained by the Contractor and the cost shall be included in the Contract price.

E. The Contractor shall carefully examine the general building drawings and all mechanical and electrical drawings, and carry on his work so as not to delay or interfere with the work of other trades. He shall obtain in writing from the other contractors such data as is necessary to coordinate his work with other branches. As the work in the building nears completion, all threading, cutting, etc., shall be done where directed by the Architect. Upon completion of the work, all remaining waste materials and rubbish resulting from the Contract work shall be

removed from the building and premises. The Contractor shall review the phasing schedule and meet all requirements of the schedule. The building must be kept in use at all times.

F. Where the phrase "or approved equivalent," "or equivalent" or "approved" appears in these specifications, it shall refer to the approval of the Architect on the material or equipment involved.

G. The terms "The Contractor" or "This Contractor" or "the HVAC Contractor" mentioned in these specifications refers to the Contractor responsible for the work and equipment included in these specifications.

H. The General Contractor will provide chases and openings in walls, floors, ceilings, and partitions of new construction to receive pipe lines, risers, ducts, and other equipment insofar as it is possible to predetermine the exact location, but the Contractor shall install his work sufficiently in advance of the building construction to permit his work to be built into place. This Contractor shall advise the General Contractor of the exact size and location of all chases and openings required for the installation of his work, and shall check size and location of all such chases and openings provided by the General Contractor.

I. The HVAC Contractor shall furnish and install all necessary structural steel members for the proper support of all piping, ductwork, and equipment furnished and installed under this Contract.

J. The Contractor shall furnish and place all sleeves required for pipes or ducts passing through new floors, walls and ceilings before such general construction work is built into place. The Contractor shall place all inserts required for hangers and supports, as the construction work progresses, so that unnecessary cutting of construction work will be eliminated.

K. Contractor's particular attention is directed to the Present Building construction. The HVAC Contractor shall furnish and install all necessary structural steel members for the proper support of all piping, ductwork, and equipment furnished and installed under this Contract. Refer to the Architect's front end specifications for additional requirements.

L. The Contractor shall do all cutting and patching required for the installation of his work.

M. Advance work as rapidly as possible to permit the heating and cooling systems to be used when it is required for all areas of the building. The installation of equipment shall follow the phasing schedule. Instruct the Operating Personnel as to the proper care and maintenance of all systems. However, this Contractor shall operate the new systems until the new systems are complete while the building is under construction. He shall also coordinate the operation of the system with the Owner so that heat remains on in all areas during construction. Provide all required temporary heat as directed by the Construction Manager.

N. Equipment and materials of similar types shall be of the same manufacturer unless specifically indicated otherwise on the drawings or herein specified. All materials shall be strictly in accordance with the quality, style, and sizes as specified herein. Manufacturers' names and plate numbers are given in the specifications to denote a standard of quality, style, size, and type and shall exclude material of other manufacturers. The Contractor shall make final connections

between all equipment furnished under this Contract and equipment furnished under other contracts as noted.

O. The materials used throughout shall be those of reputable manufacturers and shall be new and the best of their respective kinds. All equipment, components and materials shall be installed in a neat and workmanlike manner in accordance with best trade practices, manufacturer's recommendations, and applicable codes and standards and by men skilled in each particular branch of the work assigned to them. All work shall be installed subject to the approval of the Architect.

P. A complete list of materials proposed for each installation shall be submitted to the Architect for approval before delivery to the site. The Contractor shall submit samples of materials for approval at the site as requested by the Architect. Such materials may be incorporated into the structures after serving their purpose as samples.

Q. Where the Contractor elects to substitute approved materials or equipment for materials or equipment specified, as the basis of design. The Contractor will be held responsible for all structural, mechanical, and electrical changes required for their installation at no additional cost to the Owner. If additional engineering design is required, the Contractor shall reimburse the design engineer for all costs.

R. The Contractor shall be entirely responsible for all apparatus, equipment and appurtenances furnished by him or his Subcontractors in connection with the work, and special care shall be taken to protect all parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds, or other means to prevent dirt, grit, plaster, or other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep all open ends of pipes, ductwork, VAV/CAV Boxes and all other equipment, etc., closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy waterproof tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be suitably dried out before placed in service. Materials and equipment shall be stored in areas designated by the Architect.

S. Grades, elevations and locations shown on the drawings are approximately correct; however, the Contractor shall field check and otherwise verify all such data at the site before proceeding with the work. The Contractor shall make necessary survey equipment available at all times and shall make use of such equipment wherever necessary to properly install his equipment.

T. The Contractor shall visit the site and thoroughly acquaint himself with conditions existing at the site before submitting his proposal as he will be held responsible for the installation of the work complete in every detail. The Contractor shall especially review the phasing schedule and ensure compliance with this schedule.

U. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

V. Carefully examine all drawings included under this Contract and drawings included under other contracts and report any discrepancies noticed to the Architect as this contractor shall be responsible for the HVAC system installation in its entirety.

W. Due to the small scale of the drawings, it is not possible to indicate all offsets, fittings, valves, dampers, access panels, and similar parts which may be required. The drawings are diagrammatic and generally indicative of the work to be installed. The Contractor shall carefully investigate the structural and finish conditions affecting the work and arrange all work accordingly, furnishing necessary parts and equipment as may be required to meet the various conditions.

X. Contractor shall layout his work from dimensions of Architectural and Structural Drawings and actual dimensions of equipment being installed. Layouts in congested areas should not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry, OHSA and the National Electrical Code.

Y. The Contractor shall furnish the services of manufacturers' representatives for all equipment furnished under these Contract Documents. The amount of factory service provided by the Contractor shall be as normally recommended and furnished by the various equipment manufacturers unless specified otherwise. Testing of such systems and equipment shall be made under the direct supervision of competent authorized service representatives and the Commissioning Agent. Any and all expenses incurred by the equipment manufacturers' representatives shall be borne by the Contractor.

Z. All equipment and materials shall be manufactured in accordance with national standards established by manufacturer's associations, engineering and testing societies, such as NBMA, NEMA, ASTM, AMCA, ASME, ANSI, ACI, etc., where such standards have been established.

AA. When the installation is reported in writing by the Contractor to be complete and ready for acceptance, tests and inspection shall be made by the Contractor in the presence of the Architect and Commissioning Agent to ascertain whether it complies with the specifications and Contract, and upon its failure to do so, the Contractor shall at once remedy all defects and shortcomings and any additional tests that may be required shall be entirely at the Contractor's expense. All of the testing work shall be done when and as directed by the Architect before the system is accepted.

BB. Include any excavation and backfill as required for work included under this Contract. Work shall conform to all applicable state and local regulations governing safety provisions at excavation sites.

CC. The Architect/Engineer reserves the right to revise locations of piping, locations of equipment, etc., within the building as long as sizes remain the same.

DD. In all cases where equipment and materials are specified in the singular or plural number, it is intended that such reference shall apply to as many such items as are required to complete the installation.

EE. Where piping, ducts, or other equipment pass through existing or new fire or smoke barrier stops, walls, floors, or ceilings, this Contractor shall furnish and install sleeves and shall thoroughly seal openings around sleeves, pipes, etc. with fire and smoke resistant materials. Materials shall be furnished by the HVAC Contractor as required to maintain the fire rating of the walls, partitions, ceilings and floors in accordance with the requirements of NFPA, the state building codes and other applicable codes.

FF. The Contractor shall properly lubricate all moving parts of equipment and appurtenances installed under this Contract.

GG. The Contractor will be responsible for the completion of all work included under this Contract and shall employ skilled and qualified tradesmen as necessary to satisfy all work and trades.

HH. Piping, ductwork, materials and equipment shall be stored in areas as coordinated with the Architect.

1.3 PERMITS, CODES AND INSPECTIONS

A. Obtain and pay for permits and inspections required by laws, ordinances, rules and regulations having jurisdiction for work included under Contract. Obtain certificates of each required inspection as construction progress dictates, and submit same to the Owner's Representative prior to acceptance of the Work.

B. Systems and installation work shall be completed in accordance with the 2015 International Building Code, 2015 International Mechanical Code, and 2015 International Energy Conservation Code.

C. Do work in accordance with all applicable requirements including but not limited to National Fire Protection Association, Underwriter's laboratories, Inc., National Electrical Code, O.S.H.A., and other regulatory bodies having jurisdiction over this class of work. Where applicable, materials and equipment shall bear stamps or seals of NFPA, UL, ASME, AMCA, NEMA, IEEE, NEC, and other recognized regulating agencies.

1.4 DEFINITIONS

A. To clarify and establish relationships for responsibility of work to be performed under this section, designations underlined in the subsequent paragraphs of this Article are defined.

B. Provide shall mean that work or equipment thus described shall be furnished and installed complete and all responsibility and costs relative thereto shall rest with designated Contractor or Subcontractor.

C. Furnish shall mean that equipment thus described shall be purchased by this Contractor or Subcontractor and delivered to job site for installation or erection under this or another contract or subcontract. Furnishing contractor shall be responsible for including installation data and competent supervision assistance to coordinate equipment or components into working and operable systems.

1. Magnitude of installation data and supervision assistance shall be as specifically stated elsewhere herein, or the minimum as interpreted by the Owner's Representative.

D. Contractor as stated herein shall mean HVAC Contractor or Subcontractor unless specifically designated as General Contractor, electrical Subcontractor, etc. If trades or sections of work are prime or sublet, the term "Contractor" shall be used as applicable to Contractor or Subcontractor as defined by the division established by the Contract Documents.

E. Contract as stated herein shall mean HVAC Contract or Subcontract unless specifically designated as General Contract, Electrical Subcontract, etc. If trades or sections of work are prime or sublet, the term "Contract" shall be used as applicable to Contract or Subcontract as defined by the division established by the Contract Documents.

F. Inspect, Inspection, Inspector: To inspect the work of contractors means to observe the work of those contractors and/or subcontractors on all tiers responsible for implementing Consultant's plans, specifications, reports, and other instruments of professional service. An inspector has no authority or responsibility to direct any construction workers, and may not stop the work. An inspector is not responsible for, and does not have the education, training, or experience needed to affect the means, methods, sequences, or operations of construction, or safety procedures attendant thereto.

G. Accepted shall mean accepted by the Owner's Representative.
Approved shall mean approved by the Owner's Representative.
Equivalent shall mean equivalent approved by the Owner's Representative
Directed shall mean directed by Owner's Representative.
HC or HVAC shall mean Heating, & Ventilating Contractor.
PC shall mean Plumbing Contractor.
EC shall mean Electrical Contractor.
GC shall mean General Contractor.*
NEC shall mean National Electrical Code, latest revision.
AFF shall mean Above Finished Floor or Grade to centerline.
FBO shall mean Furnished By Others.
*"General" Contract Work may be performed by various contractors.
See documents for division of responsibilities.

1.5 SHOP DRAWINGS AND SUBMITTALS

A. Refer to Architect’s specifications for submittal requirements.

B. At the close of the job, prior to final review, five (5) bound copies of operations and maintenance (O&M) manuals shall be submitted by transmittal to the Engineer for review and acceptance. In lieu of hard copy O&M manuals, the Contractor may submit two (2) copies on CD format containing PDF files. O&M manuals, regardless of format, shall include the following:

1. Equipment warranties.
2. Contractors' warranties.
3. Parts list and manuals for all equipment.

4. Operating instructions (in writing).
5. Written instructions on maintenance and care of the systems.
6. Lubrication and recommended spare parts.

C. Prior to the installation of any equipment or materials, submit shop drawings and manufacturer's data for the items listed in the Submittal Log (Attachment A) in accordance with the Contract Documents. Submittal Log (Attachment A) shall serve as the Contractor's checklist to assure the complete submission of all required shop drawings and manufacturer's data. Additionally, all equipment and materials furnished as part of this Contract shall be submitted for review regardless of whether it is listed on Submittal Log (Attachment A) or not.

D. The submissions are the Contractor's documents, and the Architect's and Engineer's review or acceptance constitutes an acknowledgment that the documents have been submitted and nothing more. It is the Contractor's responsibility to check his own submissions for compliance with the Contract Documents and job conditions.

E. Any deviations from the design documents must be clearly identified so that the Engineer may properly review such items. It shall not be the Engineer's responsibility to search out these discrepancies. If such changes are not properly flagged for the Engineer's review, the Contractor shall be completely responsible for all consequences said changes might result in on the project.

F. Submit Record (As-Built) Drawings. Refer to Paragraph 3.03

1.6 SUBSTITUTIONS

A. Throughout the Specifications, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the bidder may assume the phrase "or approved equivalent," except that the burden is upon the bidder to prove such equality. If the bidder elects to prove such equality, he must request the Architect's approval in writing to substitute such item for the specified item, and shall submit supporting data, and samples if required, to permit a fair evaluation of the proposed substitution with respect to quality, serviceability and warranty. All data pertinent to the proposed substitution shall be submitted to the Architect at least 10 days prior to the bid date for evaluation and review purposes. If the Architect accepts the proposed substitution, an addendum will be issued to all bidders advising all bidders that this substitution will be acceptable from all bidders.

B. Substitutions of equipment other than that specified must be very carefully checked to assure that no problems will occur due to dimensional differences, code requirements, connection points, weights, etc. Where the Contractor elects to substitute materials or equipment approved by the Architect for those specified, the Contractor will be held responsible for all architectural, structural, mechanical, and electrical changes required for the installation of the substituted materials at no additional cost to the Owner. All tests required to substantiate the equivalence of the material will be the obligation of the Contractor.

C. When this Contractor desires to furnish equipment of a manufacturer other than that specified or intended, he shall include a complete specification of the substituted item, along with each

submission copy of shop drawings, indicating the necessary modifications to the substituted product to satisfy the requirements of the Contract Specifications. Manufacturer's specifications shall be written as close as possible over the Contract Specifications and each paragraph shall bear the same paragraph number as the Contract Specifications so that close comparison can be made. All submissions will be rejected should they not include the comparison specification. Comparison specification shall be submitted for approval 10 days prior to the Bid Date. If prior approval is not obtained, no substitutions will be considered and the Engineer reimbursed for time spent to reject and return such submission.

D. The verification specification shall include the exact wording of the Contract Specification and the revised wording identified properly indicating all the deviations proposed. If no deviations are noted, the Contractor must furnish the material or equipment in accordance with the Contract Specifications.

E. Should the Contractor elect to propose a substitution after the project has been awarded, the Contractor will be billed for the time spent by the Architect and his consultants in evaluating the proposed substitution. This billing shall occur whether the proposed substitution is accepted or rejected and shall be at the rate of the direct cost to the Architect times a 2.5 multiplier.

F. The submissions are the Contractor's documents, and the Architect's and Engineer's approval constitutes an acknowledgment that the documents have been submitted and nothing more. It is the Contractor's responsibility to check his own submissions for compliance with the Contract Documents and job conditions.

1.7 QUESTIONS AND CLARIFICATIONS OF BID DOCUMENTS

A. Bidders shall not rely on any verbal clarification of the Drawings and Specifications. Any questions or clarifications shall be referred to Engineer at least seven (7) working days prior to bidding to allow for issuance of an addendum.

1.8 MECHANICAL PLANS

A. The mechanical plans are intended to be diagrammatic and are based on one (1) manufacturer's equipment. They are not intended to show every item in its exact location, the exact dimensions or all the details of the equipment. The Contractor shall verify the actual dimensions of any specified or substituted materials and equipment to ensure that they will fit in the available space. All apparatus shall be located as closely as conditions will permit and deviations there from shall be made only with the consent of the Engineer and without additional charge. The right is reserved by the Engineer to make any reasonable changes in the location of the equipment prior to rough-in without invoking additional expense. This contractor shall be responsible to create and distribute for sign-off amongst other trades ductwork and HVAC piping coordination drawings. Refer to Subsection 3.5 for further clarification.

1.9 SPECIAL ENGINEERING SERVICES

A. In the instance of Mechanical and Control systems, such as all major and special equipment, heating equipment, controls, fans, or similar miscellaneous systems and equipment, the installations, final connections and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be employed by the respective equipment manufacturer and/or an authorized representative. Any and all expenses incurred by these equipment manufacturers' representatives shall be borne by the Contractor.

1.10 SCHEDULE OF WORK

A. The Contractor shall arrange his work to comply with the Architect's schedule and the published or revised phasing schedule. The Contractor shall submit a complete schedule of work to the Architect for approval at the beginning of the Contract in accordance with the phasing schedule. The schedule shall clearly indicate the proposed order in which the various parts of the work will be undertaken and the estimated time required for the completion of each particular part of the work. All work shall be coordinated with work being performed by contractors of other trades, with the Owner and phasing schedule.

B. The schedule of work may be revised periodically during the course of construction, but each revised schedule must be approved by the Architect.

1.11 EQUIPMENT GUARDS

A. Equipment guards shall be provided for protection at all belts, chains, gears, motors or other moving parts of equipment and machinery installed under this Contract. Guards shall be made up of suitable structural shapes and heavy gauge steel welded together and attached to equipment by removable clips and bolts. Guards shall be neat and substantial and shall be securely attached to equipment. After fabrication, guards shall be cleaned of rust and scale and painted with one coat of metal primer followed by two coats of enamel to match the equipment. Guards shall be easily removable for maintenance and service of equipment. All equipment guards shall conform with OSHA requirements.

1.12 LOCATIONS

A. Obtain detailed and specific information regarding location of all equipment, as the final location may differ from that indicated on drawings. Relocate work improperly placed because of Contractor's failure to obtain this information and reinstall as directed, without additional expense to Owner.

B. The design is subject to such revisions as may be necessary to overcome building obstructions. No changes are to be made in location of equipment without prior written approval by Architect.

C. Owner's Representative reserves the right to change locations of equipment, diffusers, registers, thermostats, plumbing fixtures, floor drains, and other items prior to roughing-in, up to a distance of 25 feet without additional charge by the Contractor.

D. Door swings may vary from plans. Take note of actual door swings at time of rough-in. Do not install thermostats, switches or other items behind the swing of any door.

1.13 PAINTING

A. All painting shall be included under the General Contract.

1.14 MISCELLANEOUS IRON WORK

A. Furnish and install all miscellaneous iron work including, but not limited to, piping hangers, piping anchors and guides, ductwork supports, and all other equipment supports. All additional structural members shall be furnished and installed to support the heating, ventilating and air conditioning equipment without excessive stress or strain on the building construction. Structural beams and other structural members shall be furnished and installed under this Contract for anchors and guides where the building steel is not available or capable of supporting or anchoring pipe lines and equipment.

B. All equipment and materials furnished and installed under this Contract which are not mounted on bases or floors shall be securely attached and supported from the main supporting structure of the building by metal hangers, clamps and/or brackets. Metal hangers, clamps and/or brackets shall be of suitable design and of sufficient strength to properly and safely support the materials and equipment involved. Lag screws and bolts shall be used where required at wood construction.

C. Materials

1. Structural steel members for the support of equipment installed under this Contract shall conform to ASTM Specifications A 36 and shall comply with the latest requirements of the American Institute of Steel Construction. Structural steel shall be of standard sections as given in the structural steel manufacturers' handbooks.

D. Priming and Painting

1. All steel and iron work shall be primed with Rust Oleum X 60, or approved equivalent. Before priming all metal shall be thoroughly cleaned free from scale, rust, and dirt.

E. Paint final coat black on all miscellaneous steel installed under this contract by this Contractor.

F. Anchors

1. The Contractor shall provide all anchors, bolts, screws, dowels, and connecting members and do all cutting and fitting necessary to secure the work to adjoining construction. Build in connecting members to masonry, concrete, and structural steel as the new and remodeling work progresses.

G. Supports and Brackets

1. Supports and brackets shall be neatly constructed of structural shapes to adequately support the equipment intended. All supports must be approved prior to installation. Field conditions will regulate the type of support.

1.15 DRAWINGS AND SPECIFICATIONS

A. Carefully examine the drawings and specifications for architectural, structural and other Divisions and Sections of the Work. If any discrepancies occur between the drawings, or between the drawings and specifications, report such discrepancies to the Owner's Representative in writing and obtain written instructions as to the manner in which to proceed. No departures from Contract Drawings will be made without prior written approval of Owner's Representative.

B. Report any discrepancies at least 72 hours prior to submission of a bid. Questions received less than 72 hours prior to date of bid opening will not be answered by formal written addendum. Oral and other interpretations or clarifications will be without legal effect. In the event such discrepancies are not reported and claims for extra charges to any contract result, such claims will be allocated to, and charged to, the Contractor who, in the judgment of Owner's Representative, is the responsible party.

C. In the event of questions or disputes as to intent or meaning of Contract Drawings or Specifications, an interpretation will be given by the Owner's Representative and said interpretation will be final and binding.

D. Specifications and the Drawings are not intended to define all details, finish materials, covers, fittings and special construction which may be required or necessary. Furnish, install and connect same in order to make installation complete and adequate as implied by Specifications and Drawings.

E. Drawings are diagrammatic only and do not show exact routes and locations of equipment. Familiarize yourself with the work of other contractors and arrange your work to avoid conflicts. In the event of conflict of work with existing conditions and work of any other contractor, obtain a new approved location of work from Owner's Representative.

F. Because of the small scale of the Drawings, it is not possible to indicate offsets in piping, conduit and ductwork, pipe, fittings, valves, access panels and similar items which may be required to make a complete operating system. Carefully investigate conditions affecting work and install work in such manner that interferences between pipes, ducts, conduit, equipment, architectural and structural features will be avoided and provide such offsets, fittings, access panels or valves as may be required to meet conditions at the building, and in accordance with applicable codes or governing body so as to avoid such interferences, without additional cost to the Owner.

G. Specifications and drawings are complementary, include work shown on drawings but not specified, and vice versa, as if both shown and specified. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

H. Consider work new even though no mention is made of new, unless otherwise indicated to the contrary herein or on the drawings.

I. When work has been completed and before final approval, deliver to the Owner's Representative a complete set of prints of contract drawings, properly and clearly marked in colored pencil, to show all changes made in original contract drawings and to represent the work as constructed.

J. Contractor shall layout his work from dimensions of Architectural and Structural Drawings and actual dimensions of equipment being installed. Layouts in congested areas shall not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry.

1.16 UTILITIES

A. Be responsible for all coordination and scheduling of construction as necessary for the performance of work under your Contract.

B. Unless otherwise indicated, be responsible for payment of all utility charges for installation/connection/on site construction for work required under your Contract.

1.17 PROTECTION

A. Effectively protect at own expense, such of work, materials or equipment as are liable to loss, damage or injury during the construction period and be held responsible for any such loss, injury or damage until work is fully and finally accepted.

B. Refer to Division 01 for additional requirements.

1.18 SKILLED MECHANICS

A. Install work under the Contract in a neat and workmanlike manner. Work which in the judgment of the Owner's Representative is not so installed: remove and replace to his satisfaction, at your expense. Do work with workmen skilled in their respective trade. Leave areas broom clean and equipment clean of dirt, rust, dust, tags and fingermarks.

1.19 TRADE NAMES

A. Trade names and manufacturer's equipment numbers are used to amplify the specifications and establish type and quality of equipment specified.

B. If substitute equipment offered for use requires material or equipment beyond that shown or required by this contract, it will be provided at Contractor's expense, regardless of trade involved.

C. Substitutions will be accepted as delineated in Division 01.

1.20 PERFORMANCE OF EQUIPMENT

A. Materials, equipment and appurtenances of any kind shown on drawings, hereinafter specified, or required for completion of the work in accordance with the intent of these specifications, will be completely satisfactory and acceptable as regards operation, performance and capacity. No approval, written or verbal, of any drawings, descriptive data or samples of such material, equipment or appurtenances will relieve you of your responsibility to turn over complete installation of heating and ventilating systems to the Owner's Representative in perfect working order and in complete conformance with Drawings and specifications at completion of the work.

B. Any material, equipment or appurtenances, the operation, capacity or performance of which does not comply with requirements of Drawings and Specifications, or which is damaged prior to acceptance by the Owner's Representative will be held to be defective material and will be removed and replaced with proper and acceptable materials, equipment and appurtenances or put in proper and acceptable working order, satisfactory to the Owner's Representative.

C. Properly lubricate moving parts of equipment and appurtenances. Start up and test them.

D. Operate equipment without objectionable noise or vibration as determined by the Owner's Representative. Should such objectionable noise or vibration be produced and transmitted to occupied portions of the building by apparatus, piping, pumps or other parts of this Work, make necessary changes as approved without cost to the Owner.

1.21 AVAILABLE SPACE

A. Be responsible for verifying dimensions of available space for equipment to be installed under this Contract, and verify dimensions of new equipment prior to delivery. After delivery of new equipment, if it is found that it does not properly fit available space, with required clearances, remove the equipment from the project site and provide equipment to fit available space, at no additional cost to Owner. Be responsible for rigging new equipment required under Contract, through the building, and provide cutting and patching of building construction for rigging of equipment to be installed under Contract, unless otherwise noted.

B. Should the proposed equipment require disassembly for entry through openings, be responsible for disassembling equipment for passage through the openings, and reassembling the equipment for installation at locations as indicated. Be responsible for proper operation and guarantee of disassembled and reassembled equipment; should equipment not operate properly or become damaged due to disassembly and reassembly, replace equipment at no additional cost to the Owner.

C. Carefully schedule delivery of equipment to project site in accordance with the Schedule of Work.

1.22 FLASHINGS

A. The Contractor shall furnish and install roof curbs as required for his equipment.

B. The Contractor shall furnish and install pipe portals for pipes as required.

C. An approved roofing sub-contractor, responsible to the Heating Contractor, shall install flashings at roof curbs and final roofing, to maintain the roof warranty.

1.23 OPENINGS IN WALLS AND ROOF

A. The appropriate Prime Contractor will furnish openings for intakes in the new exterior walls of the building. These are all located and shown on the Drawings and shall be coordinated between this Contractor and the appropriate Prime Contractor. HVAC Contractor shall furnish openings in existing walls and roof for intake and outlets. This Contractor shall coordinate location and site. Openings in existing roofs shall be the responsibility of this Contractor. Final roofing shall be by the appropriate Prime Contractor.

1.24 EXISTING EQUIPMENT

A. Contractor shall disconnect and remove existing equipment, piping, controls and all auxiliaries; as required for renovations. All materials and equipment being removed shall become Contractor's property and shall be removed from site immediately upon being removed from the system unless equipment is tagged or marked to remain Owner's property, in which case it shall be stored on the project site where directed by the Owner.

B. Material and equipment to be removed shall be demolished in place either by disassembly or by flame cutting. All flame cutting shall be performed with adequate fire protection and extinguishing facilities available as required by safety codes and by local Fire Official. All materials, equipment and debris shall be removed as the property of Contractor. Demolished materials, equipment and debris shall be removed from the project site at least weekly and shall not be stored on project, except by specific permission of Owner. Any existing equipment which is removed and remains the Owner's property shall be carefully disconnected from piping and foundations. Flame cutting of piping or equipment shall have prior approval from the Owner since other portions of the Building will be occupied during construction.

C. Contractor shall remove all existing concrete pads, steel frames, etc., on which the existing equipment being removed was mounted, remove pads down to below level of existing floor. Contractor shall patch openings in exiting floor due to removal of the concrete pads and existing equipment, piping, ductwork and similar items.

D. All existing branch piping and ductwork shall be removed from existing mains or risers to units being removed. Contractor shall cap branch piping and ductwork at existing mains or risers. Piping buried in existing walls that are to remain need not be removed providing it does not interfere with construction but shall be capped or plugged.

E. Unless otherwise indicated this Contractor shall also terminate all wiring and remove all electrical items pertaining to the items removed under this Contract.

1.25 SOUND CRITERIA

A. Fans-Compressors – Not to exceed 80 decibels at 5 feet from any point on the unit using Sound Level Meter and Method according to ASA Z24.3.

B. Sound Pressure Levels (dB re MicroPascals) (through each octave band) of rooms shall not exceed the following:

	Frequency Bands (HZ)						
Room	63	125	250	500	1000	2000	4000
Waiting Rooms, Corridors	60	55	50	45	40	35	30

PART 2 - PRODUCTS

2.1 ELECTRIC MOTORS, STARTERS AND SELECTOR SWITCHES

A. Electric Motors

1. All electrical motors furnished and installed under this Contract shall be manufactured by Reliance, General Electric, U.S. Motors, or approved equivalent and shall be of the proper type and frame of the services involved in accordance with the NEMA and Equipment Manufacturer's recommendations. Motors shall be "energy efficiency" type with 1.15 service factor. Motor windings shall be all copper. Where possible, motors shall be permanently lubricated. Where motors must be lubricated, the manufacturer shall furnish the services of a representative to review the lubrication procedure with the Contractor and the Owner and turn over to both of them all of the necessary maintenance literature. Motors and installation shall conform with all applicable requirements of the National Electrical Code. Motors shall be suitable for across-the-line or reduced voltage starting as applicable in each instance. Provide the Electrical Contractor with all motor data to properly size overcurrent protection devices for all combination starters and disconnect switches. The HVAC Contractor shall be responsible for any additional costs to the Electrical Contractor resulting from any changes in motor sizes initiated by the HVAC Contractor, from sizes scheduled on the Drawings.

B. Manual Motor Starters

1. Manual motor starters shall be furnished by this Contractor, for installation by the Electrical Contractor, for single phase fractional horsepower (1/2 horsepower and smaller) motors. Provide all motor electrical characteristics to the Electrical Contractor so the Electrical Contractor may size wiring.

C. Safety Switches

1. Safety Switches shall be furnished to the Electrical Contractor for installation.
   a. Safety switches shall be of the fusible type as indicated, quick make, quick break in NEMA Type 1 sheet steel enclosure unless otherwise noted. Switches shall be horsepower rated, and of size and number of poles as indicated on the Drawings. Safety switches shall be of type having a direct mechanical linkage between contacts and operating handle. Safety switches shall be as manufactured by Cutler-Hammer, General Electric, or Square D Company. Fuses for all switches shall be of the UL Class RKI Low Peak as manufactured by the Bussmann Mfg. Division of the McGraw Edison Company. Fuses for motors shall be sized to conform with the motor running current and in strict accordance with the recommendations of the fuse manufacturer.
   b. Where switches are located at the exterior of the Building or in wet locations, they shall be provided with NEMA 3R or 4 weather tight and weather resistant enclosures. Enclosures for switches located in hazardous areas shall be of the appropriate explosion proof type.
   c. Switches used as service entrance switches shall be Underwriters Laboratories listed suitable for Service Entrance Equipment.

D. The H.C. shall coordinate the starter control circuit transformer VA requirements with the ATC contractor prior to ordering starters.

E. Disconnect switches serving remotely mounted soft starters or VFD's shall be furnished with a minimum of one (1) set of normally open auxiliary contacts.

2.2 ACCESS PANELS

A. The HVAC Contractor shall furnish and install factory fabricated access panels for access to all concealed dampers, damper actuators valves, and other equipment where no other means of access is available. Access panels shall be of appropriate size but not less than 24" flush type, hinged to drop down and out, screwdriver operated, stainless steel in tile work and prime coated sheet steel in plaster or acoustical tile of all types. The HVAC Contractor shall furnish and install access panels for all equipment installed under this Contract. Exact locations and sizes of panels shall be determined by the HVAC Contractor, but panels shall be located for a symmetrical appearance. Access panels are not required at lift out removable tile ceilings.

B. At locations where access panels are installed in existing or new fire rated construction, access panels shall contain the 1 1/2 hour fire rated "B" label; and in addition, shall also be provided with layers of gypsum wall board in a thickness which will supply an additional one and two hour fire rating equal to the fire rating of adjacent construction.

C. Coordinate with the General Contractor on fire ratings of new and existing construction.

2.3 FIRE STOPPING

A. The following fire stopping requirements constitute minimum requirements of this specification. The Contractor shall be aware of additional requirements by the Construction Manager, which may exceed or supercede this specification.

B. Seal openings of fire rated construction with a material or product that has been tested at an independent testing laboratory, such as UL, FM, etc. Fire stopping shall conform to ASTM E 814 and UL 1479, with fire ratings equal to or exceeding the fire rating of the construction involved. Fire stopping shall be UL classified, and shall be similar to the 3M brand Fire Barrier Penetration Sealing Systems, or approved equivalent. Fire stopping of this type shall also be utilized for openings through smoke rated construction.

C. If desired by the Contractor and approved by local codes, the "Pro Set" piping penetration system also may be utilized. Penetration system shall be UL certified and shall be the "Pro Set" System A. Firestop coupling (sleeve) shall be filled with ceramic fiber material to provide insulation and fire stopping. System shall be capable of maintaining a 3 hour fire rating. Penetration system shall be secure, waterproof, fire rated, and smokeproof and shall allow for pipe expansion and contraction.

PART 3 - EXECUTION

3.1 CLEANING

A. At the completion of the work all parts of the installation shall be thoroughly cleaned. All strainers, vents, pumps, etc., shall be cleaned of all dirt. All temporary replaceable air filters shall be removed and new replaceable air filters shall be installed after the areas have been cleaned for occupancy. The system shall be operated for a sufficient period to remove all grease, metal cuttings, and other foreign matter from the system.

B. Any stoppage or any discoloration or other damage to any part of the building, its finish or furnishings due to the Contractor's failure to properly clean the piping, shall be repaired by the Contractor without cost to the Owner.

C. All new equipment installed under this Contract, existing remaining equipment, and new and existing furnishings and finishes soiled or damaged due to the work included under this Contract shall be thoroughly cleaned as required to remove plaster, dust, paint splashes, labels and debris.

3.2 INSTRUCTIONS TO OPERATING PERSONNEL

A. The Contractor and his subcontractors shall satisfactorily complete the systems so that they are functional and operating to the satisfaction of the Architect and Commissioning Agent. All systems, their controls and their sequencing must be demonstrated to the satisfaction of the Architect and Commissioning Agent.

B. The Contractor shall furnish the services of qualified personnel, approved by the Architect and thoroughly familiar with the completed installation to instruct the permanent operating personnel in the proper operation of all systems included under this Contract and the proper care of all equipment and apparatus. These services shall be furnished for a period of five 8 hour days after the operation of the building has been taken over by the Owner.

C. When instructions are provided under this Contract, the Contractor shall have in his possession three copies of an identifying letter which shall list the names of the Contractor's qualified instruction personnel including manufacturers' representatives and subcontractors that will be giving instructions. Likewise on the same letter, spaces shall be provided for the Owner's personnel who will receive the instructions. After instructions have been given and received for each system, the Contractor's representatives and subcontractors shall sign and date the letter, and the Owner's personnel shall sign and date the letter acknowledging that they have received adequate instructions for operating and maintaining the systems and equipment. One signed copy shall be delivered to the Owner, one copy to the Architect, and one copy shall be retained by the Contractor.

D. In addition to the verbal instructions outlined above, the Contractor and his manufacturers' representatives and subcontractors shall furnish written basic instructions indicating the proper operation of each system and associated equipment. Each manufacturer shall also submit a brochure on his equipment including instructions on operation, lubrication, recommended spare parts, and instructions on preventative, routine, and breakdown maintenance. All brochures and formats must be approved by the Architect.

E. The Contractor shall combine the written instructions and the manufacturers' equipment brochures in complete volumes with hard back binders which shall be turned over to the Owner before final acceptance of the Contract work. The Contractor shall furnish the Owner with three (3) complete sets of the manuals indexed by equipment and by manufacturer. The Contractor shall obtain two copies of a signed receipt from the Owner for the written instructions and equipment brochures. One copy of the receipt shall be delivered to the Architect and one copy retained by the Contractor.

F. It is the intent that this entire system with its complement of equipment and auxiliary equipment operate properly in accordance with the design concept and functional intent. It is also the intent that the Owner be given complete instructions for the proper operation and maintenance of the entire system.

3.3 RECORD (AS-BUILT) DRAWINGS

A. The Contractor shall maintain a complete set of Contract Drawings at the site and shall record all deviations in his work (in red ink or pencil) from that indicated on the Contract Drawings. Deviations shall be clearly and accurately recorded so that the Engineer can prepare final record (as-built) drawings using the Contractor’s marked-up drawings. Dimensions shall be recorded using permanent reference points such as columns, building walls and like items. Of particular importance are the locations of all interior and exterior underground utilities. These record drawings shall be submitted to the Architect prior to final acceptance.

3.4 WARRANTY

A. The Contractor shall warrant that the materials and workmanship used in the erection of this installation are as herein specified, and he shall provide all labor and materials required to make good any defects in same which become apparent within one year from date of acceptance of completed work providing such defects are due to faulty materials or workmanship and not to misuse of apparatus by the Owner, his employees, or tenants. Certain equipment shall be warranted or guaranteed for longer than one year from date of final acceptance where specifically mentioned in these specifications.

B. The equipment and materials manufacturers are expected to recognize that they are responsible for the failure of their products to perform in accordance with data furnished by them or their authorized representatives as well as misrepresentations of such data. When the products have been installed in accordance with the manufacturer's published or written instructions and recommendations and such products fail, then the Contractor and the manufacturers are responsible for replacement of the products and all associated work and materials without additional cost to the Owner. This warranty applies to all items supplied on the equipment and not just those that are the product of the manufacturer.

3.5 MERCURY PROHIBITION

A. The use of mercury as a component of any equipment installed as part of this work is strictly prohibited. Where required, mercury substitutes shall be used in thermometers, thermostats, switches, and other equipment, which might commonly contain mercury.

3.6 CUTTING AND PATCHING

A. New Construction

1. Except where indicated otherwise, General Contractor will construct all chases and recesses, bulkheads and openings through roof and walls in new construction to accommodate work to be placed under this Contract. Contractor shall locate and size all openings and set sleeves when requested so as not to delay work of the General Contractor. Final responsibility for placement and suitability of such chases, openings and recesses shall rest with this Contractor.
2. Interior openings not located before walls are in place shall be cut at this Contractor's expense. All patching made necessary by said cutting shall be at this Contractor's expense. All holes required after masonry is in place shall be made with a rotary drill and shall be drilled between ribs, beams or joist spacing.

B. Existing Construction

1. All openings in completed new work and in existing walls or ceilings of existing building construction required to install work under Contract shall be cut by this Contractor, except openings in existing exterior walls and existing roofs which shall be cut by the General Contractor. All rough patching made necessary by Contractor's cutting shall be this Contractor's responsibility and shall be performed by workmen skilled in the

respective trades. Surfaces of patchwork shall match adjacent existing construction subject to approval of Owner's Representative. Holes required through existing walls shall be cut with a core drill and shall be drilled between ribs, beams or joists. Finish patching will be by General Contractor.

2. Coordinate location of equipment, sleeves and raceways with other contractors.
3. Rough patch all openings in existing construction created by Contractor, caused by removal of existing equipment, and associated materials under Contract, except openings in existing roofs which shall be patched by General Contractor. Finish patching will be by General Contractor.

END OF SECTION 230506

SUBMITTAL LOG (ATTACHMENT A)

Project Name: _____

CJL Project No.: _____ **Trade:** _____

Engineer's Review: A = Reviewed, B = Rejected, C = Furnish as Corrected, D = Comments Attached

Contractor's Required Response: E = Confirm, F = Resubmit

No.	Specification Number	Description	Manufacturer	Date Received	Action Taken	Date Returned
	23 0519	Piping Specialties - HVAC				
	23 0523	HVAC Valves				
	23 0529	Hangers and Supports - HVAC				
	23 0553	Equipment & Piping Identification - HVAC				
	230548	Vibration Controls for HVAC Piping and Equipment				
	23 0593	Testing, Adjusting, and Balancing of Systems (TAB Reports)				
	23 0700	HVAC Insulation				
	23 2113	HVAC Piping				
	23 8239	Unit Heaters				

SECTION 230523

GENERAL-DUTY VALVES FOR HVAC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Valves

B. Related Sections

1. Division 23 HVAC piping Sections for specialty valves applicable to those Sections only.
2. Division 23 Section "Identification for HVAC Piping and Equipment" for valve tags and schedules.

1.2 SUBMITTALS

A. Product Data: For each type of valve indicated.

1.3 QUALITY ASSURANCE

A. Source Limitations for Valves: Obtain each type of valve from single source from single manufacturer.

B. ASME Compliance: ASME B16.10 and ASME B16.34 for ferrous valve dimensions and design criteria.

PART 2 - PRODUCTS

2.1 GENERAL REQUIREMENTS FOR VALVES

A. Refer to HVAC valve schedule articles for applications of valves.

B. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

C. Ball valves shall be provided with stem extensions to prevent condensation on cold surfaces, unless condensation falls into a condensate pan.

D. Manufacturer's name and number shall appear on valve directory or on a metal tag attached to valve.

E. For valves in lines 2" and smaller, use threaded or solder ends; for valves in lines 2-1/2 and larger, use tapped lug bodies.

F. Valve Sizes: Same as upstream piping unless otherwise indicated.

G. Valve Actuator Types
   1. Handlever: For quarter-turn valves NPS 6 and smaller except plug valves.

H. Valves in Insulated Piping: With 2-inch stem extensions and the following features:
   1. Ball Valves: With extended operating handle of non-thermal-conductive material, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation.

I. Valve-End Connections
   1. Solder Joint: With sockets according to ASME B16.18.
   2. Threaded: With threads according to ASME B1.20.1.

J. Two-Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim

   1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
      a. Conbraco Industries, Inc.; Apollo Valves
      b. Crane Co.; Crane Valve Group; Crane Valves
      c. Milwaukee Valve Company
      d. NIBCO Inc.
      e. Watts Regulator Co.; a division of Watts Water Technologies, Inc.
   2. Description
      a. Standard: MSS SP-110
      b. SWP Rating: 150 psig
      c. CWP Rating: 600 psig
      d. Body Design: Two piece
      e. Body Material: Bronze
      f. Ends: Threaded
      g. Seats: PTFE or TFE
      h. Stem: Stainless steel
      i. Ball: Stainless steel, vented
      j. Port: Full

PART 3 - EXECUTION

3.1 EXAMINATION

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.

3.2 VALVE INSTALLATION

A. Install valves with unions at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves in horizontal piping with stem at or above center of pipe.

D. Install valves in position to allow full stem movement.

E. Use unions at all final connections and where required to permit easy removal of valves, strainers, etc.

3.3 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.4 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, butterfly, or gate valves.
2. Throttling Service: ball valves.

B. If valves with specified SWP classes or CWP ratings are not available, the same types of valves with higher SWP classes or CWP ratings may be substituted.

C. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 and Smaller: Threaded ends except where solder-joint valve-end option is indicated in valve schedules below.
2. For Steel Piping, NPS 2 and Smaller: Threaded ends.

3.5 WATER VALVE SCHEDULE

A. Pipe NPS 2 and Smaller

1. Bronze Valves: May be provided with solder-joint ends instead of threaded ends.
2. Ball Valves: Two piece, full port, bronze with bronze trim.

END OF SECTION 230523

SECTION 230529

HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Steel pipe hangers and supports
2. Trapeze pipe hangers
3. Thermal-hanger shield inserts

B. See Division 05 Section "Metal Fabrications" for structural-steel shapes and plates for trapeze hangers for pipe and equipment supports.

C. See Division 21 Section "Water-Based Fire-Suppression Systems" for pipe hangers for fire-protection piping.

D. See Division 23 Section "Expansion Fittings and Loops for HVAC Piping" for pipe guides and anchors.

E. See Division 23 Section "Vibration Controls for HVAC Piping and Equipment" for vibration isolation devices.

F. See Division 23 Section(s) " Metal Ducts" and "Nonmetal Ducts" for duct hangers and supports.

1.2 DEFINITIONS

A. Terminology: As defined in MSS SP-90, "Guidelines on Terminology for Pipe Hangers and Supports."

1.3 PERFORMANCE REQUIREMENTS

A. Design supports for multiple pipes capable of supporting combined weight of supported systems, system contents, and test water.

B. Design equipment supports capable of supporting combined operating weight of supported equipment and connected systems and components.

1.4 SUBMITTALS

A. Product Data: For the following:

1. Steel pipe hangers and supports
2. Thermal-hanger shield inserts
3. Powder-actuated fastener systems

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 STEEL PIPE HANGERS AND SUPPORTS

A. Description: MSS SP-58, Types 1 through 58, factory-fabricated components. Refer to Part 3 "Hanger and Support Applications" Article for where to use specific hanger and support types.

B. Manufacturers

1. B-Line Systems, Inc.; a division of Cooper Industries
2. Carpenter & Paterson, Inc.
3. ERICO/Michigan Hanger Co.
4. Grinnell Corp.
5. National Pipe Hanger Corporation
6. PHD Manufacturing, Inc.

C. Galvanized, Metallic Coatings: Pregalvanized or hot dipped.

D. Nonmetallic Coatings: Plastic coating, jacket, or liner.

E. Padded Hangers: Hanger with fiberglass or other pipe insulation pad or cushion for support of bearing surface of piping.

2.3 TRAPEZE PIPE HANGERS

A. Description: MSS SP-69, Type 59, shop- or field-fabricated pipe-support assembly made from structural-steel shapes with MSS SP-58 hanger rods, nuts, saddles, and U-bolts.

2.4 THERMAL-HANGER SHIELD INSERTS

A. Description: 100-psig- minimum, compressive-strength insulation insert encased in sheet metal shield.

B. Manufacturers

1. Carpenter & Paterson, Inc.
2. ERICO/Michigan Hanger Co.
3. Pipe Shields, Inc.

C. Insulation-Insert Material for Hot Piping: Water-repellent treated, ASTM C 533, Type I calcium silicate or ASTM C 552, Type II cellular glass.

D. For Trapeze or Clamped Systems: Insert and shield shall cover entire circumference of pipe.

E. For Clevis or Band Hangers: Insert and shield shall cover lower 180 degrees of pipe.

F. Insert Length: Extend 2" beyond sheet metal shield for piping operating below ambient air temperature.

PART 3 - EXECUTION

3.1 HANGER AND SUPPORT APPLICATIONS

A. Specific hanger and support requirements are specified in Sections specifying piping systems and equipment.

B. Comply with MSS SP-69 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 finish.

D. Use nonmetallic coatings on attachments for electrolytic protection where attachments are in direct contact with copper tubing.

E. Use padded hangers for piping that is subject to scratching.

F. Horizontal-Piping Hangers and Supports: 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 noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30.
2. Adjustable, Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8.
3. U-Bolts (MSS Type 24): For support of heavy pipes, NPS 1/2 to NPS 30.

G. Hanger-Rod Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Steel Clevises (MSS Type 14): For 120 to 450 deg F piping installations.

H. Building Attachments: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Top-Beam C-Clamps (MSS Type 19): For use under roof installations with bar-joist construction to attach to top flange of structural shape.
2. Side-Beam or Channel Clamps (MSS Type 20): For attaching to bottom flange of beams, channels, or angles.
3. Center-Beam Clamps (MSS Type 21): For attaching to center of bottom flange of beams.
4. Side-Beam Brackets (MSS Type 34): For sides of steel or wooden beams.
5. Plate Lugs (MSS Type 57): For attaching to steel beams if flexibility at beam is required.

I. Saddles and Shields: 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.

J. Spring Hangers and Supports: Unless otherwise indicated and except as specified in piping system Sections, install the following types:

1. Spring-Cushion Roll Hangers (MSS Type 49): For equipping Type 41 roll hanger with springs.

K. Comply with MSS SP-69 for trapeze pipe hanger selections and applications that are not specified in piping system Sections.

L. Comply with MFMA-102 for metal framing system selections and applications that are not specified in piping system Sections.

M. Perforated band iron, wire or chain will not be permitted for hangers or supports of pipe.

3.2 HANGER AND SUPPORT INSTALLATION

A. Steel Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. Install hangers, concrete inserts, brackets, supports, clamps, and attachments as required to properly support piping from building structure.

B. Trapeze Pipe Hanger Installation: Comply with MSS SP-69 and MSS SP-89. 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 above for individual pipe hangers.

2. Field fabricate from ASTM A 36/A 36M, steel shapes selected for loads being supported. Weld steel according to AWS D1.1.

C. Thermal-Hanger Shield Installation: Install in pipe hanger or shield for insulated piping.

D. Fastener System Installation

1. Install powder-actuated 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.
2. Install mechanical-expansion anchors in concrete after concrete is placed and completely cured. Install fasteners according to manufacturer's written instructions.
3. Submit sketches for proposed hangers indicating type of construction, number and size of piping and maximum spacing to engineer for approval.

E. Install hangers and supports complete with necessary inserts, bolts, rods, nuts, washers, and other accessories.

F. Install hangers and supports to allow controlled thermal and 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.

G. Install lateral bracing with pipe hangers and supports to prevent swaying.

H. 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.

I. Load Distribution: Install hangers and supports so piping live and dead loads and stresses from movement will not be transmitted to connected equipment.

J. Pipe Slopes: Install hangers and supports to provide indicated pipe slopes and show maximum pipe deflections allowed by ASME B31.9 (for building services piping) are not exceeded.

K. Insulated Piping: Comply with the following:

1. Attach clamps and spacers to piping.
   a. Piping Operating above Ambient Air Temperature: Clamp may project through insulation.
   b. Do not exceed pipe stress limits according to 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.
3. Install MSS SP-58, Type 40, protective shields on cold piping with vapor barrier. Shields shall span an arc of 180 degrees.
4. Shield Dimensions for Pipe: Not less than the following:
   a. NPS 1/4 to NPS 3-1/2: 12" long and 0.048" thick.
5. Insert Material: Length at least as long as protective shield.

6. Thermal-Hanger Shields: Install with insulation same thickness as piping insulation.

L. Support horizontal piping as follows:

Pipe Size	Max. Hanger Spacing	Hanger Diameter
1/2" to 1-1/4"	6'-6"	3/8"

M. Install hangers to provide minimum 1/2" space between finished covering and adjacent work.

N. Place a hanger within 12" of each horizontal elbow.

O. Use hangers with 1-1/2" minimum vertical adjustment.

P. Support horizontal cast iron pipe adjacent to each hub, with 5 feet maximum spacing between hangers.

Q. Support vertical piping at every floor. Support vertical cast iron pipe at each floor at hub.

R. Where exposed pipes pass through walls, floors or ceiling of finished rooms, furnish and install steel chromium-plated setscrew type floor, wall or ceiling plates.

S. Seal all openings through walls of air plenum spaces and relief air shafts, where ducts, pipelines, etc. are installed under this Contract to assure airtight plenum spaces. Coordinate all work with contractors of other trades.

T. All necessary structural supports and inserts to hang all piping and equipment shall be provided by this Contractor. Hanger rods shall be securely attached to plates. Where cutting is required for the installation of hangers, piping and supports, all openings must be neatly drilled by the HVAC Contractor. Punching or chipping of concrete will not be permitted. All necessary openings shall be drilled in a location and manner satisfactory to the Architect. All concrete damaged by the HVAC Contractor shall be patched, reinforced or replaced as directed by the Architect. Location of all holes, openings and sleeves shall clear reinforcing steel in floor and roof decks. Coordinate all work with the Architect and shall determine exact locations of all supports and openings, especially vibration isolation.

U. Strap hangers, wire hangers, or split-ring hangers will not be acceptable. Clevis hangers are acceptable only as hereinbefore specified for copper tubing.

V. Insulation shall be installed over band hangers and all openings shall be sealed as hereinafter specified.

W. Hanger rods installed in conjunction with hangers shall be not less than 3/8" for pipe sizes 1/2" to 2. Hanger rods shall be larger where recommended by the hanger manufacturer.

X. Lines 2" and smaller supported on steel joists shall be hung from one joist with beam clamps.

Y. Lines along walls shall be supported on neat, substantial wall hangers, securely attached to construction by means of inserts or expansion sleeves and bolts. Wall hangers shall be similar

to Modern Hanger Corporation Fig. 285, Penn Pipe Hanger Co., Arrow Pipe Hanger Co., or approved equal.

Z. All supports directly in contact with copper lines shall be all copper where possible or copper-plated where approved by the Architect. Ferrous metals shall not be used in contact with copper lines. Hangers shall be all-copper as hereinbefore specified.

AA. Where piping is insulated, insulation shall be extended through sleeves. Sleeves shall be at least two sizes larger than the pipe or of suitable dimensions to allow the installation of pipe, insulation and sealant.

BB. At all locations, space between sleeve and pipe shall be filled with sealant to level of sleeve. Sealant shall be Dow Corning 3-6548RTV, or approved equal. Conform with manufacturer's recommended installation procedures.

3.3 FINISH

A. Prime coat exposed steel hangers and supports. Hangers and supports located in pipe shafts, and suspended ceiling spaces are not considered exposed.

3.4 MISCELLANEOUS IRON WORK

A. Furnish and install all miscellaneous iron work including, but not limited to, piping hangers, piping anchors and guides, ductwork supports, and all other equipment supports. All additional structural members shall be furnished and installed to support the heating, ventilating and air conditioning equipment without excessive stress or strain on the building construction. Structural beams and other structural members shall be furnished and installed under this Contract for anchors and guides where the building steel is not available or capable of supporting or anchoring pipe lines and equipment.

B. All equipment and materials furnished and installed under this Contract which are not mounted on bases or floors shall be securely attached and supported from the main supporting structure of the building by metal hangers, clamps and/or brackets. Metal hangers, clamps and/or brackets shall be of suitable design and of sufficient strength to properly and safely support the materials and equipment involved. Lag screws and bolts shall be used where required at wood construction.

C. Materials

1. Structural steel members for the support of equipment installed under this Contract shall conform to ASTM Specifications A-36 and shall comply with the latest requirements of the American Institute of Steel Construction. Structural steel shall be of standard sections as given in the structural steel manufacturers' handbooks.

D. Priming

1. All steel and iron work shall be primed with Rust-Oleum X-60, or equivalent. Before priming all metal shall be thoroughly cleaned free from scale, rust, and dirt.

E. Anchors

1. Provide all anchors, bolts, screws, dowels, and connecting members and do all cutting and fitting necessary to secure the work to adjoining construction. Build in connecting members to masonry, concrete, and structural steel as the new and remodeling work progresses.

F. Supports and Brackets

1. Supports and brackets shall be neatly constructed of structural shapes to adequately support the equipment intended. All supports must be approved prior to installation. Field conditions will regulate the type of support.

3.5 PAINTING

A. Touch Up: Clean field welds and abraded areas of shop paint. Paint exposed areas immediately after erecting hangers and supports. Use same materials as 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 minimum dry film thickness of 2.0 mils.

B. Galvanized Surfaces: Clean welds, bolted connections, and abraded areas and apply galvanizing-repair paint to comply with ASTM A 780.

END OF SECTION 230529

SECTION 230548

VIBRATION CONTROLS FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Isolation pads
2. Isolation mounts
3. Spring hangers

1.2 SUBMITTALS

A. Product Data: For each product indicated.

B. Delegated-Design Submittal: For vibration isolation and details indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

C. Qualification Data: For professional engineer.

D. Field quality-control test reports.

PART 2 - PRODUCTS

2.1 VIBRATION ISOLATORS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amber/Booth Company, Inc.
2. Kinetics Noise Control.
3. Mason Industries.
4. Vibration Eliminator Co., Inc.
5. Vibration Isolation.
6. Vibration Mountings & Controls, Inc.

B. Mounts: Double-deflection type, with molded, oil-resistant rubber, hermetically sealed compressed fiberglass, or neoprene isolator elements with factory-drilled, encapsulated top plate for bolting to equipment and with baseplate for bolting to structure. Color-code or otherwise identify to indicate capacity range.

1. Materials: Cast-ductile-iron or welded steel housing containing two separate and opposing, oil-resistant rubber or neoprene elements that prevent central threaded element and attachment hardware from contacting the housing during normal operation.
2. Neoprene: Shock-absorbing materials compounded according to the standard for bridge-bearing neoprene as defined by AASHTO.

C. Spring Isolators: Freestanding, laterally stable, open-spring isolators.

1. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
2. Minimum Additional Travel: 50 percent of the required deflection at rated load.
3. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
4. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
5. Baseplates: Factory drilled for bolting to structure and bonded to 1/4" thick, rubber isolator pad attached to baseplate underside. Baseplates shall limit floor load to 500 psig.
6. Top Plate and Adjustment Bolt: Threaded top plate with adjustment bolt and cap screw to fasten and level equipment.

D. Spring Hangers: Combination coil-spring and elastomeric-insert hanger with spring and insert in compression.

1. Frame: Steel, fabricated for connection to threaded hanger rods and to allow for a maximum of 30 degrees of angular hanger-rod misalignment without binding or reducing isolation efficiency.
2. Outside Spring Diameter: Not less than 80 percent of the compressed height of the spring at rated load.
3. Minimum Additional Travel: 50 percent of the required deflection at rated load.
4. Lateral Stiffness: More than 80 percent of rated vertical stiffness.
5. Overload Capacity: Support 200 percent of rated load, fully compressed, without deformation or failure.
6. Elastomeric Element: Molded, oil-resistant rubber or neoprene. Steel-washer-reinforced cup to support spring and bushing projecting through bottom of frame.
7. Self-centering hanger rod cap to ensure concentricity between hanger rod and support spring coil.

PART 3 - EXECUTION

3.1 VIBRATION-CONTROL DEVICE INSTALLATION

A. Comply with requirements in Division 07 Section "Roof Accessories" for installation of roof curbs, equipment supports, and roof penetrations.

B. Equipment Restraints

1. Install resilient bolt isolation washers on equipment anchor bolts where clearance between anchor and adjacent surface exceeds 0.125".

C. Piping Restraints

1. Comply with requirements in MSS SP-127.
2. Space lateral supports a maximum of 40 feet o.c., and longitudinal supports a maximum of 80 feet o.c.
3. Brace a change of direction longer than 12 feet.
4. Pipe isolation hangers shall provide no more than 5% transmissibility at the lowest disturbing frequency. All piping systems shall be resiliently supported within 50 feet of connected rotating equipment.

D. Install cables so they do not bend across edges of adjacent equipment or building structure.

E. Install bushing assemblies for anchor bolts for floor-mounted equipment, arranged to provide resilient media between anchor bolt and mounting hole in concrete base.

F. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.

3.2 ADJUSTING

A. Adjust isolators after piping system is at operating weight.

B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.

C. Adjust active height of spring isolators.

D. Adjust restraints to permit free movement of equipment within normal mode of operation.

END OF SECTION 230548

SECTION 230553

IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Equipment labels
2. Valve tags
3. Pipe labels
4. Duct labels

1.2 SUBMITTAL

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

PART 2 - PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Seton

B. Brimar

C. Bunting

D. Brady Co.

E. Kimball Systems

2.2 MATERIALS

A. Color: Unless specified otherwise, conform with ANSI/ASME A13.1.

B. Laminated Plastic Nameplates: 3" x 1" Laminated three-layer plastic with engraved black (1/4" high) letters on white background. Engraved micarta with pressure-sensitive backing and shall be nonabsorbent, non-porous and colorfast.

C. Plastic Tags: Laminated three-layer plastic with engraved black (1/4" high) letters on white background. Tag size minimum 1" x 2" square.

D. Stencils: With clean cut symbols and letters of following size:

Outside Diameter of Insulation or Pipe	Length of Color Field	Size of Letters
3/4" - 1-1/4"	8"	1/2"

E. Stencil Paint: In accordance with Division 09, semi- gloss enamel.

F. Plastic Pipe Markers: Factory fabricated, flexible, semi-rigid plastic, preformed to fit around pipe or pipe covering; minimum information indicating flow direction arrow and fluid being conveyed.

G. Do not use stick on labels.

2.3 VALVE TAGS

A. Tag each new valve, controller, and other devices requiring adjustment and affecting the performance of equipment furnished under this Contract. Prepare a list giving the number of each valve, its location, and the equipment or portion of the system tagged. The list shall be enclosed in a metal frame with glass and shall be hung where directed. Tags shall be of aluminum or brass, 2" in diameter with numbers as large as possible and attached by short, small link aluminum or brass chains or "S" hooks. Numbers and tags shall be coordinated with those being installed under this Contract.

B. Prepare a typewritten list giving the number of each valve, its location, and the equipment or portions of the system controlled. The list shall be enclosed in a metal frame with glass. The list shall be hung at location directed by Architect.

C. Contractor shall match existing identification nomenclature presently in use at facility.

2.4 EQUIPMENT IDENTIFICATION

A. Where valves, cleanouts, dampers, etc., are located above removable tile ceiling or above access panels, furnish and install identification labels on the corners of the access panels or removable ceiling tiles. Labels shall be provided with the word "VALVES", "RELAY", "DAMPER", etc., so that the equipment may be readily located in the future.

B. Adhesive backing shall be chemically compounded to hold tight and fast at wide temperature extremes. Labels shall be additionally secured with screws or rivets. Flexible plastic punched tapes will not be acceptable. Labels shall be coordinated with those being installed under other contracts.

C. All major pieces of HVAC equipment shall include, at a suitable and accessible observation point on the equipment, a manufacturer's stamped brass or aluminum identification plate, with all pertinent capacity data stamped on the plate. Identification plate shall include all specific data, such as model number, serial number, motor data, horsepower, capacities, sizes, amperes, power consumption, speed, flows in GPM, temperatures, working pressures, operating pressures, and similar factors as applicable. In addition, pumps shall include total head in feet and impeller sizes.

D. The Contractor shall be responsible for furnishing and attaching an identification plate for the above mentioned major equipment if not provided by the equipment manufacturer.

E. Equipment marking tags shall be engraved phenolic, 1/16" thick, four edges bound, black with white lettering. The tag shall be securely mounted to the equipment with minimum of two (2) – 3/8" long No. 3 screws. Tags shall provide such information as: "Exhaust Fan – EF2,", "Air Handling Unit – AHU 1" and include "date of installation and project number".

F. All remote starters and disconnects shall also be tagged with the equipment they serve. (i.e. "AHU-1", EF-1", etc.)

G. The installations will not be considered acceptable unless identification plates and nameplates are attached.

2.5 PIPING IDENTIFICATION

A. All piping insulated and uninsulated, installed throughout this Contract, shall be stenciled with the name of the service, such as HWS, CWS, etc., and with an arrow indicating the direction of flow.

B. Stenciled letters shall in general, be plain black and shall be located near each branch connection, at each valve, at each change in direction, on each side of walls or floors, and at least every 20' on straight runs of pipe. On smaller runs of piping, center the designations. In lieu of stenciling, snap-around pipe markers by Seton Nameplate Co. "Set Mark", or approved equivalent may be utilized. Identification and colors shall comply with ANSI A13.1. Snap-around markers shall be suitable for exterior use where utilized.

C. Where pipes are adjacent to each other, markings shall be neatly lined up. All markings shall be located in such a manner as to be easily legible from the floor. Markings on black pipes shall be white.

D. Stenciled letters shall in general, be plain black and shall be located near each branch

PART 3 - EXECUTION

3.1 PREPARATION

A. Prepare surfaces in accordance with Division 09 for stencil painting.

3.2 INSTALLATION

A. Plastic Nameplates: Install with corrosion-resistant mechanical fasteners, adhesive not acceptable.

B. Plastic Tags: Install with corrosion-resistant chain.

C. Stencil Painting: Apply in accordance with Division 09.

D. Plastic Pipe Markers: Install in accordance with manufacturer's instructions.

E. Underground Plastic Pipe Markers: Install 6" to 8" below finished grade, directly above buried pipe.

F. Controls: Identify control panels and major control components outside panels with plastic nameplates. Secured with screws. Do not use adhesive.

G. Valves: Tag each valve in main and branch piping, but no individual shutoff or local control valves at equipment.

H. Piping: Identify piping, concealed or exposed, with plastic pipe markers or stenciled painting. Tags may be used on small diameter piping. Identify service, flow direction, and pressure. Install in clear view and align with axis of piping. Locate identification not to exceed 20 feet on straight runs including risers and drops, adjacent to each valve and "T", at each side of penetration of structure or enclosure, and at each obstruction.

3.3 VALVE CHART AND SCHEDULE

A. Provide valve chart and schedule in aluminum frame with clear plastic shield. Install at location as directed.

B. Provide whiteprint schedules framed under glass, showing number, location, color code and designation of piping controlled, mounted in a designated location. Provide two additional copies of valve schedule in hardback covers to Owner.

C. Contractor shall match existing piping and equipment identification nomenclature presently in use at facility.

END OF SECTION 230553

SECTION 230593

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Balancing Air Systems
   a. Constant-volume air systems

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 REFERENCES

A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.

B. ASHRAE – 2011 Applications Handbook: Chapter 38, Testing, Adjusting and Balancing.

C. NEBB – Procedural Standards for testing, Balancing and Adjusting of Environmental Systems.

1.4 SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

1.5 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or NEBB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or NEBB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC or NEBB as a TAB technician.
3. All field work by the Testing, Adjusting, and Balancing Firm shall be under the direct supervision of a registered Professional Engineer, licensed to practice in the Commonwealth of Pennsylvania and who is a full time employee of the firm.

B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 TESTING AND BALANCE REPORT

A. Provide the services of an independent qualified testing, adjusting and balancing firm as approved by the Owner's Representative. The testing, adjusting and balancing firm shall submit evidence that it has been engaged in this type of service for a minimum of five (5) years and that it has balanced systems of comparable size and complexity as specified for the project.

B. HVAC Contractor and balancing firm are responsible for testing, adjusting and balancing air and water systems and balancing and adjusting existing equipment and systems where this equipment and systems are being altered under this Contract.

C. Coordinate the balancing work with all other Contractors, Temperature Control Subcontractor, Owner's Representative and the Owner. Temperature Control Subcontractor shall adjust controls. Perform balancing of the heating systems when outdoor air temperature is averaging below 30°F and the cooling systems when outdoor air temperature is above 80°F.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts and Nonmetal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation. Verify that dirty filters have been removed and that new clean filters are in place.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for all air devices. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Check dampers for proper position to achieve desired airflow path.

D. Check for airflow blockages.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.
   a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

B. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

C. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 PROCEDURES FOR EXISTING SYSTEMS

A. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured pre demolition airflows..
2. Balance each air outlet.

3.7 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Air Outlets and Inlets: Plus or minus 10 percent.

3.8 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.9 FINAL REPORT

A. General: Prepare and submit four (4) copies of a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Field test reports prepared by system and equipment installers.
2. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Notable characteristics of systems.

12. Nomenclature sheets for each item of equipment.
13. Notes to explain why certain final data in the body of reports vary from indicated values.

D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Balancing stations.
4. Position of balancing devices.

3.10 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

END OF SECTION 230593

SECTION 230700

HVAC INSULATION

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Insulation Materials
   a. Cellular glass
   b. Mineral fiber
2. Insulating cements
3. Adhesives
4. Mastics
5. Sealants
6. Factory-applied jackets
7. Tapes
8. Securements

1.2 SUBMITTALS

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

1.3 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Insulation and related materials shall have fire-test-response characteristics indicated, as determined by testing identical products per ASTM E 84, by a testing and inspecting agency acceptable to authorities having jurisdiction. Factory label insulation and jacket materials and adhesive, mastic, tapes, and cement material containers, with appropriate markings of applicable testing and inspecting agency.

1. Insulation Installed Indoors: Flame-spread index of 25 or less, and smoke-developed index of 50 or less.
2. Insulation Installed Outdoors: Flame-spread index of 75 or less, and smoke-developed index of 150 or less.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Comply with requirements in Part 3 schedule articles for where insulating materials shall be applied.

B. Products shall not contain asbestos, lead, mercury, or mercury compounds.

C. Products that come in contact with stainless steel shall have a leachable chloride content of less than 50 ppm when tested according to ASTM C 871.

D. Insulation materials for use on austenitic stainless steel shall be qualified as acceptable according to ASTM C 795.

E. Foam insulation materials shall not use CFC or HCFC blowing agents in the manufacturing process.

F. Cellular Glass: Inorganic, incombustible, foamed or cellulated glass with annealed, rigid, hermetically sealed cells. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Cell-U-Foam Corporation; Ultra-CUF.
   b. Pittsburgh Corning Corporation; Foamglas Super K.
2. Block Insulation: ASTM C 552, Type I.
3. Special-Shaped Insulation: ASTM C 552, Type III.
4. Board Insulation: ASTM C 552, Type IV.
5. Preformed Pipe Insulation without Jacket: Comply with ASTM C 552, Type II, Class 1.
6. Preformed Pipe Insulation with Factory-Applied ASJ: Comply with ASTM C 552, Type II, Class 2.
7. Factory fabricate shapes according to ASTM C 450 and ASTM C 585.

G. Mineral-Fiber, Preformed Pipe Insulation

1. Products: Subject to compliance with requirements, provide one of the following:
   a. Fibrex Insulations Inc.; Coreplus 1200.
   b. Johns Manville; Micro-Lok.
   c. Knauf Insulation; 1000 Pipe Insulation.
   d. Manson Insulation Inc.; Alley-K.
   e. Owens Corning; Fiberglas Pipe Insulation.
2. Type I, 850 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type I, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

3. Type II, 1200 deg F Materials: Mineral or glass fibers bonded with a thermosetting resin. Comply with ASTM C 547, Type II, Grade A, with factory-applied ASJ. Factory-applied jacket requirements are specified in "Factory-Applied Jackets" Article.

2.2 ADHESIVES

A. Materials shall be compatible with insulation materials, jackets, and substrates and for bonding insulation to itself and to surfaces to be insulated.

2.3 MASTICS

A. Materials shall be compatible with insulation materials, jackets, and substrates; comply with MIL-C-19565C, Type II.

2.4 FACTORY-APPLIED JACKETS

A. Insulation system schedules indicate factory-applied jackets on various applications. When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.

2.5 FITTING COVERS/INSULATION

A. Products: Subject to compliance with requirements. Provide one of the following:

1. HamFAB (Leighton, PA)
2. Elolux (Astoria, NY)

B. Preformed fiberglass, mitered fiberglass, calcium silicate. Protect fittings by field applied fitting covers as necessary. Loose packed and wrapped insulation covered with plastic fitting covers is not acceptable.

PART 3 - EXECUTION

3.1 PREPARATION

A. Surface Preparation: Clean and dry surfaces to receive insulation. Remove materials that will adversely affect insulation application.

B. Coordinate insulation installation with the trade installing heat tracing. Comply with requirements for heat tracing that apply to insulation.

C. Mix insulating cements with clean potable water; if insulating cements are to be in contact with stainless-steel surfaces, use demineralized water.

3.2 GENERAL INSTALLATION REQUIREMENTS

A. Install insulation materials, accessories, and finishes with smooth, straight, and even surfaces; free of voids throughout the length of equipment, ducts and fittings, and piping including fittings, valves, and specialties.

B. Install insulation materials, forms, vapor barriers or retarders, jackets, and thicknesses required for each item of equipment, duct system, and pipe system as specified in insulation system schedules.

C. Install accessories compatible with insulation materials and suitable for the service. Install accessories that do not corrode, soften, or otherwise attack insulation or jacket in either wet or dry state.

D. Install insulation with longitudinal seams at top and bottom of horizontal runs.

E. Install multiple layers of insulation with longitudinal and end seams staggered.

F. Do not weld brackets, clips, or other attachment devices to piping, fittings, and specialties.

G. Keep insulation materials dry during application and finishing.

H. Install insulation with tight longitudinal seams and end joints. Bond seams and joints with adhesive recommended by insulation material manufacturer.

I. Install insulation with least number of joints practical.

J. Where vapor barrier is indicated, seal joints, seams, and penetrations in insulation at hangers, supports, anchors, and other projections with vapor-barrier mastic.

1. Install insulation continuously through hangers and around anchor attachments.
2. For insulation application where vapor barriers are indicated, extend insulation on anchor legs from point of attachment to supported item to point of attachment to structure. Taper and seal ends at attachment to structure with vapor-barrier mastic.
3. Install insert materials and install insulation to tightly join the insert. Seal insulation to insulation inserts with adhesive or sealing compound recommended by insulation material manufacturer.
4. Cover inserts with jacket material matching adjacent pipe insulation. Install shields over jacket, arranged to protect jacket from tear or puncture by hanger, support, and shield.

K. Apply adhesives, mastics, and sealants at manufacturer's recommended coverage rate and wet and dry film thicknesses.

L. Install insulation with factory-applied jackets as follows:

1. Draw jacket tight and smooth.

2. Cover circumferential joints with 3" wide strips, of same material as insulation jacket. Secure strips with adhesive and outward clinching staples along both edges of strip, spaced 4" o.c.
3. Overlap jacket longitudinal seams at least 1-1/2". Install insulation with longitudinal seams at bottom of pipe. Clean and dry surface to receive self-sealing lap. Staple laps with outward clinching staples along edge.
   a. For below ambient services, apply vapor-barrier mastic over staples.
4. Cover joints and seams with tape as recommended by insulation material manufacturer to maintain vapor seal.
5. Where vapor barriers are indicated, apply vapor-barrier mastic on seams and joints and at ends adjacent to duct and pipe flanges and fittings.

M. Cut insulation in a manner to avoid compressing insulation more than 75 percent of its nominal thickness.

N. Finish installation with systems at operating conditions. Repair joint separations and cracking due to thermal movement.

O. Repair damaged insulation facings by applying same facing material over damaged areas. Extend patches at least 4" beyond damaged areas. Adhere, staple, and seal patches similar to butt joints.

P. For above ambient services, do not install insulation to the following:

1. Vibration-control devices
2. Testing agency labels and stamps
3. Nameplates and data plates

3.3 GENERAL PIPE INSULATION INSTALLATION

A. Requirements in this article generally apply to all insulation materials except where more specific requirements are specified in various pipe insulation material installation articles.

B. Insulation Installation on Fittings, Valves, Strainers, Flanges, and Unions

1. Install insulation over fittings, valves, strainers, flanges, unions, and other specialties with continuous thermal and vapor-retarder integrity, unless otherwise indicated.
2. Insulate pipe elbows using preformed fitting insulation or mitered fittings made from same material and density as adjacent pipe insulation. Each piece shall be butted tightly against adjoining piece and bonded with adhesive. Fill joints, seams, voids, and irregular surfaces with insulating cement finished to a smooth, hard, and uniform contour that is uniform with adjoining pipe insulation.
3. Insulate tee fittings with preformed fitting insulation or sectional pipe insulation of same material and thickness as used for adjacent pipe. Cut sectional pipe insulation to fit. Butt each section closely to the next and hold in place with tie wire. Bond pieces with adhesive.
4. Insulate valves using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe

insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. For valves, insulate up to and including the bonnets, valve stuffing-box studs, bolts, and nuts. Fill joints, seams, and irregular surfaces with insulating cement.

5. Insulate strainers using preformed fitting insulation or sectional pipe insulation of same material, density, and thickness as used for adjacent pipe. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker. Fill joints, seams, and irregular surfaces with insulating cement. Insulate strainers so strainer basket flange or plug can be easily removed and replaced without damaging the insulation and jacket. Provide a removable reusable insulation cover. For below ambient services, provide a design that maintains vapor barrier.
6. Insulate flanges and unions using a section of oversized preformed pipe insulation. Overlap adjoining pipe insulation by not less than two times the thickness of pipe insulation, or one pipe diameter, whichever is thicker.
7. Cover segmented insulated surfaces with a layer of finishing cement and coat with a mastic. Install vapor-barrier mastic for below ambient services and a breather mastic for above ambient services. Reinforce the mastic with fabric-reinforcing mesh. Trowel the mastic to a smooth and well-shaped contour.
8. For services not specified to receive a field-applied jacket except for flexible elastomeric and polyolefin, install fitted PVC cover over elbows, tees, strainers, valves, flanges, and unions. Terminate ends with PVC end caps. Tape PVC covers to adjoining insulation facing using PVC tape.
9. Stencil or label the outside insulation jacket of each union with the word "UNION." Match size and color of pipe labels.

C. Insulate instrument connections for thermometers, pressure gages, pressure temperature taps, test connections, flow meters, sensors, switches, and transmitters on insulated pipes, vessels, and equipment. Shape insulation at these connections by tapering it to and around the connection with insulating cement and finish with finishing cement, mastic, and flashing sealant.

D. Install removable insulation covers at locations indicated. Installation shall conform to the following:

1. Make removable flange and union insulation from sectional pipe insulation of same thickness as that on adjoining pipe. Install same insulation jacket as adjoining pipe insulation.
2. When flange and union covers are made from sectional pipe insulation, extend insulation from flanges or union long at least two times the insulation thickness over adjacent pipe insulation on each side of flange or union. Secure flange cover in place with stainless-steel or aluminum bands. Select band material compatible with insulation and jacket.
3. Construct removable valve insulation covers in same manner as for flanges except divide the two-part section on the vertical center line of valve body.
4. When covers are made from block insulation, make two halves, each consisting of mitered blocks wired to stainless-steel fabric. Secure this wire frame, with its attached insulation, to flanges with tie wire. Extend insulation at least 2" over adjacent pipe insulation on each side of valve. Fill space between flange or union cover and pipe

insulation with insulating cement. Finish cover assembly with insulating cement applied in two coats. After first coat is dry, apply and trowel second coat to a smooth finish.

5. Unless a PVC jacket is indicated in field-applied jacket schedules, finish exposed surfaces with a metal jacket.

3.4 PIPING INSULATION SCHEDULE, GENERAL

A. Acceptable preformed pipe and tubular insulation materials and thicknesses are identified for each piping system and pipe size range. If more than one material is listed for a piping system, selection from materials listed is Contractor's option.

3.5 INDOOR PIPING INSULATION SCHEDULE

A. Heating-Hot-Water Supply and Return, 200 Deg F and below: Insulation shall be one of the following:

1. Cellular Glass: 1-1/2" thick.
2. Mineral-Fiber, Preformed Pipe, Type I: 1-1/2" thick.

3.6 METAL SHIELDS

A. Install metal shields between hangers or supports and the piping insulation. Install rigid insulation inserts between the pipe and the insulation shields. Use inserts of equal thickness to the adjacent insulation and vapor seal each insert. Insulation inserts shall be no less than the following lengths:

1-1/2" to 2-1/2" IPS 10" long

3.7 Replace all existing insulation damaged due to installation of new work, alterations, etc.

END OF SECTION 230700

SECTION 232113

HYDRONIC PIPING

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes pipe and fitting materials, joining methods, special-duty valves, and specialties for the following:

1. Hot-water heating piping

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

C. See Division 23 Section "Hydronic Pumps" for pumps, motors, and accessories for hydronic piping.

1.2 PERFORMANCE REQUIREMENTS

A. Hydronic piping components and installation shall be capable of withstanding the following minimum working pressure and temperature:

1. Hot-Water Heating Piping: 125 psig at 200 deg F.

B. Reference Standards

1. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
2. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
3. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:
   a. ANSI/ASME Sec 9 Welding and Brazing Qualifications.
   b. ASTM A53 – Standard Specification for Pipe, Steel, Black and Hot Dipped, Zinc Coated, Welded and Seamless.
   c. ANSI/ASME B16.3 Malleable Iron Threaded Fittings Class 150 and 300.
   d. ANSI/ASME B16.9 – Factory-Made Wrought Butt welding Fittings.
   e. ANSI/ASME B16.23 – Cast Copper Alloy Solder Drainage Fitting – DWV.
   f. ANSI/ASME B16.29 – Wrought Copper and Wrought Copper Alloy Solder Joint Drainage Fittings – DWV.
   g. ANSI/ASME B31.9 Building Services Piping.
   h. ASME B36.1 – Standardization of dimensions of welded and seamless wrought steel pipe for high or low temperatures and pressures.

i. ANSI/AWS D1.1 Structural Welding Code.
j. ASTM A53 - Pipe, Steel, Black and Hot-Dipped Zinc Coated (Galvanized), Welded and Seamless, for Ordinary Uses.
k. ASTM A105 – Standard Specification for Carbon Steel Forgings for Pipe Applications.
l. ASTM A106 Grade B, Seamless piping.
m. ASTM A234 - Pipe Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
n. ASTM A312 – Standard Specification for Seamless and Welded Austenitic Stainless Steel Pipe.
o. ASTM A536 – Standard Specification for Ductile Iron Castings.
p. ASTM B88 – Standard Specification for Seamless Copper Water Tube.

1.3 SUBMITTALS

A. Product Data: For each type of the following:

1. Piping materials, joints, and fittings.
2. Hydronic specialties.
3. Valves. Include flow and pressure drop curves based on manufacturer's testing for calibrated-orifice balancing valves and automatic flow-control valves.
4. Air control devices.

B. Field quality-control test reports.

C. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. ASME Compliance: Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation. Safety valves and pressure vessels shall bear the appropriate ASME label. Fabricate and stamp air separators and expansion tanks to comply with ASME Boiler and Pressure Vessel Code: Section VIII, Division 1.

B. Installer Qualifications

1. Installers of Pressure-Sealed Joints: Installers shall be certified by pressure-seal joint manufacturer as having been trained and qualified to join piping with pressure-seal pipe couplings and fittings.

C. U.S. Steel: Use only steel products, rolled, formed, shaped, drawn, extruded, forged, cast, fabricated, or otherwise similarly, processed, or processed by a combination of two or more of such operations, from steel made in the United States. The Contractor must submit certification which satisfies the Owner that the Contractor has fully complied with this provision. [**Optional**]

1.5 DELIVERY, STORAGE AND HANDLING

A. Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate above grade and enclose with durable, waterproofing wrapping.

C. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

PART 2 - PRODUCTS

2.1 COPPER TUBE AND FITTINGS

A. Drawn-Temper Copper Tubing: ASTM B 88, Type L. **(Hard copper, typical)**

2.2 STEEL PIPE AND FITTINGS

A. Steel Pipe: ASTM A 53, black steel with plain ends; type, grade, and wall thickness as indicated in Part 3 "Piping Applications" Article.

B. Pipe Threads: ASME B1.20.1 for factory-threaded pipe and pipe fittings.

C. Cast-Iron Threaded Fittings: ASME B16.4; Classes 125 and 250 as indicated in Part 3 "Piping Applications" Article.

D. Malleable-Iron Threaded Fittings: ASME B16.3, Classes 150 and 300 as indicated in Part 3 "Piping Applications" Article.

E. Malleable-Iron Unions: ASME B16.39; Classes 150, 250, and 300 as indicated in Part 3 "Piping Applications" Article.

F. Cast-Iron Pipe Flanges and Flanged Fittings: ASME B16.1, Classes 25, 125, and 250; raised ground face, and bolt holes spot faced as indicated in Part 3 "Piping Applications" Article.

G. Wrought Cast- and Forged-Steel Flanges and Flanged Fittings: ASME B16.5, including bolts, nuts, and gaskets of the following material group, end connections, and facings:

1. Material Group: 1.1.
2. End Connections: Butt welding.
3. Facings: Raised face.

2.3 JOINING MATERIALS

A. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

2.4 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper-alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Shall not be used.

D. Dielectric Flanges: Factory-fabricated, companion-flange assembly, for 150- or 300-psig minimum working pressure as required to suit system pressures.

E. Dielectric Couplings

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
   a. Calpico, Inc.
   b. Lochinvar Corporation.
   c. Epco.
2. Galvanized-steel coupling with inert and noncorrosive thermoplastic lining; threaded ends; and 300-psig minimum working pressure at 225 deg F.

F. Dielectric Nipples: Electroplated steel nipple with inert and noncorrosive, thermoplastic lining; plain, threaded, or grooved ends; and 300-psig minimum working pressure at 225 deg F.

2.5 VALVES

A. Ball Valves: Comply with requirements specified in Division 23 Section "General-Duty Valves for HVAC Piping."

2.6 AIR CONTROL DEVICES

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Amtrol, Inc.
2. Armstrong Fluid Technology
3. Bell & Gossett; a Xylem brand
4. Taco, Inc.
5. Spirotherm, Inc.

B. Automatic Air Vents

1. Body: Bronze.
2. Internal Parts: Nonferrous.
3. Operator: Nonferrous.
4. Inlet Connection: NPS 3/4.
5. Discharge Connection: NPS 1/2.
6. CWP Rating: 150 psig.
7. Maximum Operating Temperature: 240 deg F.

2.7 HYDRONIC PIPING SPECIALTIES

A. Y-Pattern Strainers

1. Manufacturers: Subject to compliance with requirements. Provide products by one of the following:
   a. Spirax Sarco, Inc.
   b. Watts Water Technologies
   c. Victaulic Company
2. Body: ASTM A 126, Class B, cast iron with bolted cover and bottom drain connection. Strainers for city water piping: bronze body.
3. End Connections: Threaded ends for NPS 2 and smaller; flanged ends for NPS 2-1/2 and larger.
4. Strainer Screen: 40-mesh startup strainer, and perforated stainless-steel basket with 50 percent free area.
5. CWP Rating: 125 psig.

2.8 BALANCING VALVES AND INSTRUMENTS

A. Manual Balancing Valve Sizes 1/2" to 2" (NPT or Solder Connections)

1. Furnish and install, as shown on the plans, balancing valves with provision for connecting a portable differential (Ft. of Head) pressure meter. Each meter shall have pressure/temperature probes.
2. The balancing valves shall be Y-pattern globe style or ball design and all metal parts of nonferrous, pressure die cast, nonporous Ametal. Each valve shall provide four (4) functions:
   a. Precise flow measurement
   b. Precision flow balancing
   c. Positive shut-off with no drip seat
   d. Drain connection using 3/4" NPT hose end thread.
3. Valves shall have four (4) 360° adjustment turns of the handwheel for precise setting with hidden memory to provide a tamper-proof balancing setting. The handwheel can be installed in any position without affecting performance.

PART 3 - EXECUTION

3.1 PIPING APPLICATIONS

A. Hot-water heating piping, aboveground, NPS 2 and smaller, shall be any of the following:

1. Type L, drawn-temper copper tubing, wrought-copper fittings, and **soldered** joints.
2. Schedule 40 steel pipe; Class **125, cast-iron** fittings; cast-iron flanges and flange fittings; and threaded joints.

3.2 VALVE APPLICATIONS

A. Install shutoff-duty valves at each branch connection to supply mains, and at supply connection to each piece of equipment.

B. Install **manual** balancing valves in the return pipe of each heating or cooling terminal.

3.3 PIPING INSTALLATIONS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Piping shall be located as close as possible to the location shown on the drawings. Should conflicts or unforeseen conditions arise, the contractor shall either submit a proposed alternate routing for approval, or contact the Engineer for further direction.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Piping shall not pass exposed through electrical rooms or be erected over any switch board or other electrical gear.

1. Where conflicts are unavoidable, stainless steel drain pans with drain lines piped to an approved waste receptor may be provided pending written approval from the Owner.

E. Install piping to permit valve servicing.

F. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

G. Install piping to permit valve servicing.

H. Install piping at indicated slopes.

I. Install piping free of sags and bends.

J. Install fittings for changes in direction and branch connections.

K. Install piping to allow application of insulation. Provide 2" clearance between insulated piping and other obstructions.

L. Select system components with pressure rating equal to or greater than system operating pressure.

M. Install groups of pipes parallel to each other, spaced to permit applying insulation and servicing of valves.

N. Select system components with pressure rating equal to or greater than system operating pressure.

O. Unions

1. No union shall be placed in a location which will be inaccessible.
2. Unions, grooved, or flanged fittings shall be installed adjacent to all equipment for repair and replacement. Installation of fitting must facilitate maintenance and removal access without dismantling or draining the piping system beyond the equipment isolation valves. Select system components with pressure rating equal to or greater than system operating pressure.

P. Install manual air vents at all locations that form local air traps to facilitate system fill.

Q. Install automatic air vents with isolation valve at the highest point in each system. Air vent shall be rated for the system temperature, pressure and water chemistry. Where feasible, automatic air vents installed in glycol systems must be routed to the main recovery tank.

R. All piping shall be arranged to completely drain the system. Drain locations shall be located at all system low points. Install drains, consisting of a tee fitting, NPS 3/4 ball valve, and short NPS 3/4 threaded nipple with cap, at low points in piping system mains and elsewhere as required for system drainage.

S. Reduced pressure principal back flow preventers shall be installed on all make-up water lines.

T. Bull-heading tee connections are prohibited. Main fluid flows shall not enter the side of a tee fitting and then diverge.

U. Correct leaks in piping immediately, using new materials. Leak-sealing compounds or preening is not permitted.

V. Install piping at a uniform grade of 0.2 percent upward in direction of flow for supply, downward in direction of flow for return.

W. Reduce pipe sizes using eccentric reducer fitting installed with level side up.

X. Install branch connections to mains using tee fittings in main pipe, with the branch connected to the bottom of the main pipe. For up-feed risers, connect the branch to the top of the main pipe.

Y. Install valves according to Division 23 Section "General-Duty Valves for HVAC Piping."

Z. Install unions in piping, NPS 2 and smaller, adjacent to valves, at final connections of equipment, and elsewhere as indicated.

AA. Install flanges in piping, NPS 2-1/2 and larger, at final connections of equipment and elsewhere as indicated.

BB. Install strainers on inlet side of each control valve, pressure-reducing valve, solenoid valve, pump, and elsewhere as indicated. Install NPS 3/4 nipple and ball valve in blowdown connection of strainers NPS 2 and larger. Match size of strainer blowoff connection for strainers smaller than NPS 2.

CC. Install expansion loops, expansion joints, anchors, and pipe alignment guides as specified in Division 23 Section "Expansion Fittings and Loops for HVAC Piping."

DD. Identify piping as specified in Division 23 Section "Identification for HVAC Piping and Equipment."

3.4 DIELECTRIC FITTING INSTALLATION

A. Install dielectric fittings in piping at connections of dissimilar metal piping and tubing. Electrolysis control between dissimilar materials shall be achieved through the use of dielectric nipples and a non-dielectric union. Dielectric unions shall not be used.

B. Dielectric Fittings for NPS 2 and Smaller: Use dielectric nipples.

3.5 HANGERS AND SUPPORTS

A. Hanger, support, and anchor devices are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment." Comply with the following requirements for maximum spacing of supports.

B. [

C. Install the following pipe attachments:

1. Adjustable steel clevis hangers for individual horizontal piping less than 20 feet long.
2. Adjustable roller hangers and spring hangers for individual horizontal piping 20 feet or longer.
3. Pipe Roller: MSS SP-58, Type 44 for multiple horizontal piping 20 feet or longer, supported on a trapeze.
4. Spring hangers to support vertical runs.
5. Provide copper-clad hangers and supports for hangers and supports in direct contact with copper pipe.
6. On plastic pipe, install pads or cushions on bearing surfaces to prevent hanger from scratching pipe.

D. Install hangers for steel piping with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 7 feet; minimum rod size, 1/4".
2. NPS 1: Maximum span, 7 feet; minimum rod size, 1/4".
3. NPS 1-1/2: Maximum span, 9 feet; minimum rod size, 3/8".
4. NPS 2: Maximum span, 10 feet; minimum rod size, 3/8".
5. NPS 2-1/2: Maximum span, 11 feet; minimum rod size, 3/8".
6. NPS 3: Maximum span, 12 feet; minimum rod size, 3/8".
7. NPS 4: Maximum span, 14 feet; minimum rod size, 1/2".'

E. Install hangers for drawn-temper copper tubing with the following maximum spacing and minimum rod sizes:

1. NPS 3/4: Maximum span, 5 feet; minimum rod size, 1/4".
2. NPS 1: Maximum span, 6 feet; minimum rod size, 1/4".
3. NPS 1-1/2: Maximum span, 8 feet; minimum rod size, 3/8".
4. NPS 2: Maximum span, 8 feet; minimum rod size, 3/8".
5. NPS 2-1/2: Maximum span, 9 feet; minimum rod size, 3/8".
6. NPS 3: Maximum span, 10 feet; minimum rod size, 3/8".

3.6 PIPE JOINT CONSTRUCTION

A. Join pipe and fittings according to the following requirements and Division 23 Sections specifying piping systems.

B. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.

C. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly.

D. Soldered Joints: Apply ASTM B 813, water-flushable flux, unless otherwise indicated, to tube end. Construct joints according to ASTM B 828 or CDA's "Copper Tube Handbook," using lead-free solder alloy complying with ASTM B 32.

E. 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 unless dry seal threading is specified.
2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds.

3.7 HYDRONIC SPECIALTIES INSTALLATION

A. Install manual air vents at high points in piping, at heat-transfer coils, and elsewhere as required for system air venting.

3.8 TERMINAL EQUIPMENT CONNECTIONS

A. Sizes for supply and return piping connections shall be the same as or larger than equipment connections.

B. Install control valves in accessible locations close to connected equipment.

END OF SECTION 232113

SECTION 238239

UNIT HEATERS

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Cabinet unit heaters with centrifugal fans and [**hot-water**] [**electric-resistance heating**] coils.
2. Propeller unit heaters with [**hot-water**] [**electric-resistance heating**] coils.
3. Wall and ceiling heaters with propeller fans and electric-resistance heating coils.

1.2 SUBMITTALS

A. Product Data: Include rated capacities, operating characteristics, furnished specialties, and accessories for each product indicated.

B. [LEED Submittal

1. Product Data for Prerequisite EQ 1: Documentation indicating that units comply with ASHRAE 62.1-2004, Section 5 - "Systems and Equipment."]

C. Field quality-control test reports.

D. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1-2004, Section 5 - "Systems and Equipment" and Section 7 - "Construction and Startup."

C. ASHRAE/IESNA 90.1-2004 Compliance: Applicable requirements in ASHRAE/IESNA 90.1-2004, Section 6 - "Heating, Ventilating, and Air-Conditioning."

PART 2 - PRODUCTS

2.1 CABINET UNIT HEATERS

A. Furnish and install complete cabinet type unit heaters. Unit heaters shall be as scheduled on the Drawings. Ceiling mounted units shall be suspended from overhead construction with vibration isolated supports.

B. Unit heaters shall each be of the multi-speed type consisting of fans, motor, factory-wired multi-speed switch with operating handle inside cabinet and nonferrous fin and tube heating element, all enclosed in a furniture steel cabinet with piping end compartments. Provision for expansion and contraction of the heating element shall be incorporated in the design of each unit. Heating elements shall be constructed of seamless copper tubes with aluminum fins.

C. Fans shall be of the centrifugal, double inlet aluminum wheel type with forward curved blades. Fans in each unit shall be mounted on a common shaft within steel scrolls, and shall be driven by a single direct-drive motor mounted inside the cabinet. Fans shall be especially designed for quiet operation.

D. Cabinets shall be constructed of furniture grade steel, complete with piping end compartment, discharge grille and return air grille and all finished with factory baked enamel finish of colors selected by the Architect from the manufacturer's standard colors. Supply duct collar and return air grille on units as indicated on the drawings.

E. Cabinet unit heaters shall have air handling and heating capacities as scheduled on the Drawings. Unit heaters shall be properly connected to hot water supply and return lines with ball valves and balancing cocks or to steam and condensate return piping with shutoff valves and steam trap. Valves, vents, and pressure taps shall be installed inside cabinets. Unit heaters shall be automatically controlled as hereinafter specified.

F. Use inverted type for all hot water units with wall mounted controls. Do not use inverted type for steam units or units with integral thermostat.

G. Motor for each cabinet unit heater shall be multi-speed type shown.

H. Cabinet unit heaters shall be as manufactured by Trane, Dunham-Bush, or approved equivalent.

2.2 PROPELLER UNIT HEATERS

A. Furnish and install suspended propeller type unit heaters. Unit heaters shall be of the multi-speed type, consisting of fan, fan guard, motor, nonferrous finned tube heating element, cabinet, double deflection discharge louvers, hangers, etc., and shall be constructed for quiet operation. Provision for expansion and contraction of heating elements shall be incorporated in the design of the units.

B. Heating elements shall have a water working pressure of 200 psig.

C. Motors for unit heaters shall be of the multi-speed type. Units shall be controlled as specified under "Automatic Temperature Control".

D. Propeller type unit heaters shall be as manufactured by Trane, Dunham-Bush, or approved equivalent.

2.3 ELECTRIC WALL HEATER

A. The heating equipment shall include an electric automatic fan-forced air heater suitable for small are heating as manufactured by Berko Electric, Series SR or FR or approved equivalent. Heaters shall be UL listed.

B. The heater shall be designed for surface or recessed wall mounting in any position. For surface mounting, a surface mounting box shall be used. For semi-recessed installation, a semi-recessed sleeve shall be used.

C. The backbox shall be designed for duty as a recessed rough-in box in either masonry or frame construction and also when mounting directly to the surface of the finished walls in surface mounting installation. The backbox shall be 20-gauge cold rolled steel and shall contain knock outs through which field wiring leads are brought and connected to pigtails of the pre-installed female disconnect receptacle. Connecting of the male plug of the inner frame completes the wiring of the heater.

D. The inner frame assembly shall consist of a 20-gauge steel chassis on which are mounted the heating element, fan motor and blade, thermostat, fan control and thermal cut out. The inner frame assembly shall be complete pre-wired with the leads terminating in a male plug, thus facilitating positive disconnect and easy removal for service without disturbing the backbox or field wiring.

E. The heating element shall be guaranteed for five years and shall be of nonglowing design consisting of a special resistance wire enclosed in a steel sheath to which steel plate fins are brazed. The element shall cover the entire air discharge area to ensure uniform heating of all discharge air.

F. The fan motor shall be impedance protected, permanently lubricated and with totally enclosed rotor. Fan control shall be bi-metallic, snap-action type and shall activate fan after heating element reaches operating temperature, and continue to operate the fan after the thermostat is satisfied and until all heated air has been discharged. The thermostat shall be bi-metallic, snap-action, two-pole type with enclosed contacts and with positive "off" on all models. Thermal cutout shall be bi-metallic, snap-action type designed to automatically shut off heater in the event of over heating and reactivate the heater when temperatures return to normal.

G. The louvered front cover shall be of 20-gauge cold rolled steel finished in enamel finish, color as selected by Architect, with four mounting holes, mounting screws, and plug button to match finish.

H. The surface mounting box shall be of 20-gauge cold rolled steel, designed to mount around the backbox, for a finished surface installation. Slot knock outs shall be provided for power supply

conduit. Semi-recessed sleeves shall be available for semi-recessed installation in walls less than 3-1/2 inches thick.

I. All sheet metal parts shall be phosphatized, then completely painted by an electrostatic, baked enamel, painting process.

2.4 ELECTRIC CABINET UNIT HEATERS

A. Furnish and install, where indicated on the Drawings, complete electric cabinet type unit heaters. Units shall be the recessed ceiling-mounted type as shown. Ceiling-mounted unit heaters shall be securely attached to the building construction in accordance with the manufacturer's details. Vibration isolators shall be installed at all supports.

B. Each unit heater shall be of the multi-speed type consisting of fan, motor, factory-wired multi-speed switch with operating handle inside cabinet and electrical finned strip heating elements, high limit cutout switch, contactors, terminal block, fan switch selector switch, etc., all enclosed in a furniture steel cabinet with end compartments. Provision for expansion and contraction of heating elements shall be incorporated in the design of units. Heating elements shall be of the enclosed-nonglow type with all connections totally enclosed. Unit heaters shall be furnished with all protective and disconnect devices required by Underwriters' and the National Electrical Code. All controls and controllers shall be concealed within the cabinets.

C. Fans shall be the centrifugal, double-inlet type with forward-curved blades. Fans in each unit shall be mounted on a common shaft and shall be driven by a single motor mounted inside the cabinet. Fans shall be especially designed for quiet operation. Motors shall be not less than horsepower indicated, multi-speed type, wound for single-phase, 60 cycles and arranged for operation at voltage shown on Drawings, or provided with a transformer. Motors shall have automatic thermal overload protection or be provided with a thermal type switch for motor protection.

D. Cabinets shall be constructed of furniture grade steel with rounded corners, each complete with discharge grille and return air grille and finished with baked enamel of colors selected by the Architect from the manufacturer's six standard colors.

E. Cabinet unit heater heating elements shall have capacities of not less than indicated on the Drawings when supplied with voltage noted. The air-handling capacity of each unit shall be not less than indicated on the Drawings.

F. All controls for the heating elements and motors shall be factory-wired and mounted in the end compartment of each unit heater. Controls for each unit shall include contactors for heating elements and motor, disconnect circuit breaker, capacity reduction selector switch, high limit safety cutout switch, normally open fan switch to prevent element overheating. Wall mounted electric thermostats shall be furnished to the Electrical Contractor for installation and wiring.

G. All wiring inside the cabinets shall be installed in flexible metallic conduit with heat-resistant insulated conductors and in accordance with the National Electrical Code. All internal wiring shall be connected to properly labeled terminal blocks for field extension.

H. Cabinet type unit heaters shall be the Series CUH as manufactured by Berko or equal.

2.5 ELECTRIC PROPELLER UNIT HEATERS

A. Furnish and install type HUHAA propeller unit heaters as manufactured by Berko, or approved equivalent with heating and air delivery capacities as shown on the heating schedule.

B. The cabinet shall be made of 18 gauge die formed furniture grade steel. Individual adjustable louvers with 30 degrees downward stops shall be furnished with the desired control of discharge air. All metal surfaces of the enclosure shall be phosphate coated to resist corrosion and finished in a decorative baked enamel. Mounting brackets designed for either ceiling or wall swivel mounting shall be furnished.

C. Heaters shall be of the draw-through air flow design to eliminate the element hot spots and extend design life.

D. Fans shall be aluminum, directly connected to fan motor, and designed specifically for unit heater application.

E. Low voltage control 24 volt transformers shall be standard on models 7.5 KW and greater, to allow safer, more precise temperature control.

F. All heaters shall be UL Listed and meet the requirements of the National Code.

G. For safety, the electric heating bank shall consist of metal sheath heating elements. The elements shall consist of 80/20 Nichrome wire and have a copper clad steel sheath for strength and corrosion resistance, and aluminum fins for faster heat transfer. Automatic reset thermal overheat protection shall be of the linear capillary type wired for instantaneous de-energizing in case of the thermal overload. Heating bank to have protective air inlet louvers.

H. All heaters drawing in excess of 48 amperes shall be provided with factory installed subdivided and fused circuits of 48 amps or less.

I. Motors shall be totally enclosed, designed for continuous heavy-duty all-angle operation and equipped with built-in thermal overload protection.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install unit heaters to comply with NFPA 90A.

B. Suspend cabinet unit heaters from structure with elastomeric hangers[**and restraints**]. Vibration isolators[**and restraints**] are specified in Division 23 Section "Vibration Controls for HVAC Piping and Equipment."

C. Suspend propeller unit heaters from structure with all-thread hanger rods and elastomeric hangers. Hanger rods and attachments to structure are specified in Division 23 Section "Hangers and Supports for HVAC Piping and Equipment." Vibration hangers are specified in Division 23 Section "Vibration Controls for HVAC Piping and Equipment."

D. Install wall-mounted thermostats and switch controls in electrical outlet boxes at heights to match lighting controls. Verify location of thermostats and other exposed control sensors with Drawings and room details before installation.

E. Unless otherwise indicated, install union and ball valve on supply-water connection and union and calibrated balancing valve on return-water connection of each hot water unit heater.

F. Install union and ball valve on steam connection and union, trap and ball valve on condensate return connection for steam unit heaters.

G. Install new filters in each unit within two weeks of Substantial Completion.

H. Piping installation requirements are specified in other Division 23 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

I. Install piping adjacent to machine to allow service and maintenance.

J. Connect piping to cabinet unit heater's factory, hot-water piping package. Install the piping package if shipped loose.

K. Connect supply and return ducts to ducted cabinet unit heaters with flexible duct connectors specified in Division 23 Section "Air Duct Accessories."

L. Comply with safety requirements in UL 1995.

M. Ground equipment according to Division 26 Section "Grounding and Bonding for Electrical Systems."

N. Connect wiring according to Division 26 Section "Low-Voltage Electrical Power Conductors and Cables."

3.2 FIELD QUALITY CONTROL

A. Perform the following field tests and inspections and prepare test reports:

1. Operational Test: After electrical circuitry has been energized, start units to confirm proper motor rotation and unit operation.
2. Operate electric heating elements through each stage to verify proper operation and electrical connections.
3. Test and adjust controls and safety devices. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace malfunctioning units and retest as specified above.

END OF SECTION 238239

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 EXECUTION OF THE WORK

A. The scope of work shown on the drawings and in these specifications, Division 26 and 28 are all a part of this contract and shall be included in the base bid unless otherwise noted.

B. These Specifications call out certain duties of the Electrical Contractor and/or Subcontractors. They are not intended as a material list of items required by the Contract.

C. These divisions of the Specifications cover the electrical systems of the project. It includes work performed by the electrical trades as well as trades not normally considered as electrical trades.

D. Provide all items and work indicated on the Drawings and all items and work called for in the Specifications in accordance with the conditions of Contract (Division 1 General Requirements Documents). This includes all incidentals, equipment, appliances, services, hoisting, scaffolding, supports, tools, supervision, labor, consumable items, fees, licenses, etc., necessary to provide complete systems. Perform start-up and checkout on each item and system to verify the systems are fully operable.

E. Comply with all provisions of the Contract Documents including Division 1, General Conditions, and Supplementary General Conditions of the Specifications.

F. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these Specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

G. Examine and compare the Electrical Drawings and Specifications with the Drawings and Specifications of other trades, and report any discrepancies between them to the Engineer and obtain written instructions for changes necessary in the work. At time of bid the most stringent requirements must be included in said bid. Install and coordinate the electrical work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner approved by the Engineer. All changes required in the work of the Contractor caused by neglect shall be corrected at the expense of the Contractor.

H. It is the intent of the drawings and specifications to provide a complete workable system ready for the Owner's operation. These specifications are equipment and performance specifications. Items described or called out in the specification but not shown on the drawings are considered to be part of the project. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent are to be considered a part of the

contract. Installation of the equipment shall be in accordance with the N.E.C., manufacturer recommendation, and industry standards.

I. All material furnished by the Contractor shall be new and unused (temporary lighting and power products are excluded) and free from defects. All materials used shall bear the Underwriters Laboratory, Inc label provided a standard has been established for the material in question.

J. All products and materials to be new, clean, free of defects and free of damage and corrosion.

K. No exclusion from, or limitation in, the symbolism used on the Drawings for electrical work or the languages used in the Specifications for electrical work shall be interpreted as a reason for omitting accessories necessary to complete any required system or item of equipment.

L. The use of words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.

M. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material shall be the product of one manufacturer throughout. Multiple manufacturers will not be permitted.

1.2 COORDINATION OF THE WORK

A. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.

B. Carefully check space requirements with other trades and the physical confines of the area to ensure that all material can be installed in the spaces allotted thereto including finished suspended ceilings. Make modifications thereto as required and approved.

C. Transmit to other trades all information required for work to be provided under their respective sections in ample time for installation.

D. Wherever work interconnects with work of other trades, coordinate with other trades to ensure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the ceiling trade will know where to install access doors and panels.

E. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.

F. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations approved by the Engineer before proceeding with the installation.

G. The Drawings show only the general run of raceways and approximate location of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Engineer and shall receive approval before such alterations are made. All such modifications shall be made without additional cost to the Owner.

H. Obtain from the Engineer in the field the location of such outlets or equipment not definitively located on the Drawings.

I. Circuit "tags" in the form of arrows are used where shown to indicate the home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Show the actual circuit numbers on the finished record tracing and on panel directory card. Where circuiting is not indicated, the Electrical Contractor must provide required circuiting in accordance with the loading indicated on the drawings and/or as directed.

J. The Drawings generally do not indicate the exact number wires in each conduit for the branch circuit wiring of fixtures, and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated and control wiring diagrams, if any, specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.

K. Adjust locations of conduits, panels, equipment, pull boxes, fixtures, etc. to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each raceway prior to installation.

1. Right of way: lines which pitch to have the right-of-way over those which do not pitch. For example: steam, condensate, and plumbing drains normally have right-of-way. Lines whose elevations cannot be changed to have right-of-way over lines whose elevations can be changed.
2. Make offsets, transitions and changes in direction in raceways and as required to maintain proper head room in pitch of sloping lines whether or not indicated on the Drawings.

L. Contractor shall furnish services of experienced Superintendent, who shall be in constant charge of all work, and who shall coordinate his work with the work of other trades. No work shall be installed before coordinating with other trades.

1.3 EXAMINATION OF SITE

A. Prior to submitting of bids, the Contractor shall visit the site of the job and shall familiarize himself with all conditions affecting the proposed installation and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph will in no way relieve the Contractor of performing all necessary work shown on the Drawings.

1.4 PROGRESS OF WORK

A. The Contractor shall order the progress of his work so as to conform to the progress of the work of other trades and shall complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from the defective or ill-timed work performed under this section shall be borne by the Contractor.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair. Any such repairs shall be subject to review and acceptance of the Engineer.

B. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container fully identified with manufacturer's name, trade name, type, class, grade, size and color.

C. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection by the Engineer until installed. Store all items subject to moisture damage in dry, heated spaces.

1.6 EQUIPMENT ACCESSORIES

A. Provide supports, hangers and auxiliary structural members required for support of the work.

B. Furnish and set all sleeves for passage of raceways through structural, masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each raceway and passing through building surfaces.

C. Wall mounted equipment, total weight of 100 pounds or less, may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment, with total weight of more than 100 pounds, shall be mounted on adequately free standing sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Globe-Strutt and Unistrut, may be used for mounting arrays of equipment.

1.7 CUTTING, PATCHING, ETC.

A. The work shall be carefully laid out in advance. Where Cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work shall be carefully done. Any damage to the building, piping, equipment or defaced finish plaster, woodwork, metalwork, etc. shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner.

B. The Contractor shall do no cutting, channeling, chasing or drilling of unfinished masonry, tile, etc., unless he first obtains permission from the Engineer. If permission is granted, the Contractor shall perform this work in a manner approved by the Engineer.

C. Where conduits, outlet, junction, or pullboxes are mounted on a painted surface, or a surface to be painted, they shall be painted to match the surface. Whenever support channels are cut, the bare metal shall be cold galvanized.

D. Slots, chases, openings and recesses through floors, walls, ceilings, and roofs will be provided by the various trades in their respective materials. The trade requiring them to properly locate such openings and be responsible for any cutting and patching caused by the neglect to do so.

1.8 MOUNTING HEIGHTS

A. Unless otherwise noted, mounting heights for equipment and wiring devices shall be as shown as noted on the drawings.

1.9 CLEANING UP

A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc. resulting from the installation of work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Architect's instructions, which shall be promptly carried out.

B. Contractor shall clean all fixtures and equipment at the completion of the project.

1.10 PRODUCTS

A. If products and materials are specified or indicated on the drawings for a specific item or system, use those products or materials. Where noted in other sections of this specification, equipment has been specified for a specific performance and substitutions are not permitted. If products and materials are not listed in either of the above, use first class products and materials, subject to approval of Shop Drawings where Shop Drawings are required or as approved in writing where Shop Drawings are not required.

1.11 OMISSIONS FROM THE DRAWINGS

A. Should a Bidder find discrepancies in or omissions from the drawings or specifications or be in doubt as to their meaning, he shall notify the Architect before submitting his proposal. The Architect will in turn, send written instructions to all Bidders. Neither the Architect nor the Owner will be responsible for oral instructions. If the Contractor fails to comply with this requirement, he shall accept the Engineer's interpretations as to the intended meaning of the drawings and specifications.

1.12 EXECUTION

A. Follow manufacturer's instructions for installing, connecting, and adjusting all equipment. Provide one copy of such instructions to the Architect before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special supports, connections, wiring, accessories, etc.

B. Use mechanics skilled in their trade for all work.

C. Clean all items before and after installation. Clean up all debris.

D. Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

E. Applicable equipment and materials to be listed by Underwriters' Laboratories and manufactured in accordance with ASME, NEMA, ANSI or IEEE standards and as approved by local authorities having jurisdiction.

F. Before commencing work, examine all adjoining, underlying, etc., work on which this work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

1.13 VERIFICATION OF ELECTRICAL REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS

A. Prior to the installation of wiring systems for any equipment furnished by others, this contractor shall verify that the electrical requirements of the equipment match those shown on the electrical drawings by examining the approved shop drawings of that equipment. Any discrepancies shall be immediately reported to the engineer.

B. If the contractor fails to comply with this requirement, he shall be responsible for any additional costs incurred at no additional cost to the Owner.

1.14 PROTECTION OF BUILDING FIRE/SMOKE BARRIERS

A. Passages of conduit through fire barriers and/or smoke barriers shall be protected as follows:

1. The space between the penetrating item and the fire barrier and/or smoke barrier shall be filled with a material capable of maintaining the fire/smoke resistance of the barrier or be protected by an approved device designed for the specific purpose.
2. Where the penetrating item uses a sleeve to penetrate the fire and/or smoke barrier the sleeve shall be solidly set in the fire/smoke barrier and the space between the item and the sleeve shall be filled as described above.
3. Fire barriers shall include 1-hour, 2-hour, and 3-hour rated floors and walls. Refer to architectural plans for location of fire barriers and smoke barriers and provide protection required to maintain ratings in accordance with all codes.
4. Approved fill material for fire barriers shall be packed mineral wool, with ASTME-136 rating and 3M Fire Barrier caulk. Coordinate sealing of all openings with requirements of Division 7 of this specification.
5. Perform work in accordance with the appropriate UL Ratings.
6. Product Data: Provide manufacturer's specifications, recommendations and installation instructions for each application.

1.15 CODES AND FEES

A. General: Comply with Codes in accordance with the Contract Documents.

B. The electrical installation shall be in compliance with the requirements of OSHA, NEC and the rules, regulations and requirements of the power company supplying power to the building.

C. The electrical installation shall comply fully with all township, county and state laws, ordinances and regulations applicable with electrical installations.

D. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE and UL.

E. Should any change in Drawings or Specifications be required to comply with governmental regulations, the Contractor shall notify Architects prior to execution of the work. The work shall be carried out according to the requirements of such code in accordance with the instruction of the Architect and at no additional cost to the Owner.

F. The local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local utility companies with respect to their services.

G. Certificate of Inspection and approval shall be procured and paid for by this Contractor from an approved certified inspection agency.

1.16 GUARANTEE

A. General: Provide a Guarantee in accordance with the Contract Documents.

B. Submit a single guarantee stating that all portions of the work are in accordance with Contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one (1) year from date of final acceptance by the Owner, except that where guarantees or warranties for longer terms are specified herein, such longer term to apply. Within 24 hours after notification, correct any deficiencies which occur during the guarantee period at no additional cost to Owner, all to the satisfaction of the Owner and Architect. Obtain similar guarantees from subcontractors, manufacturers, suppliers and subtrade specialists.

1.17 DISPOSAL

A. All electrical items not designated by the Owner for his use to be properly disposed of according to local, state and Federal regulations.

B. Items containing polychlorinated biphenyl (PCB) to be removed, transported and disposed of according to Federal Toxic Substances Control Act (TSCA). Contractor to submit certification that these items have been properly disposed.

END OF SECTION 260500

SECTION 260519

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. General: Provide 600 volt wire and cable in accordance with the Contract Documents.

1.3 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Underwriters Laboratory Standard No. UL 467
   a. ASTM
   b. IPECA
2. Terminal Blocks
   a. UL-1059

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

A. General

1. Provide wire with a minimum insulating rating of 600 volts, except for wire used in 50 volts or below applications for control of signal systems use 300 volt minimum or 600 volt where permitted to be incorporated with other wiring systems.

B. Conductor

1. Electrical grade, annealed copper fabricated in accordance with ASTM standards. Minimum size number 12 for branch circuits; number 14 for control wiring.
2. The conductors shown on the drawings are copper, except as noted otherwise.

C. Stranding and Number of Conductors

1. Number 12 and number 10 solid.
2. Cables larger than number 10, stranded in accordance with ASTM Class B stranding designations.
3. Control wires stranded in accordance with ASTM Class B stranding designations.
4. Cables, multi-conductor unless otherwise noted for low tension systems.

D. Insulation

1. Type THWN/THHN insulation suitable for use in wet locations up to 75 degrees Centigrade. Use for lighting, receptacle and motor circuits and for panel and equipment feeders.

2.2 CONNECTORS

A. Make connections, splices, taps and joints with solderless devices, mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide not less than that of the conductor.

B. Branch Circuit wires (Number 10 and smaller): Use any of the following types of terminals and connecting devices:

1. Hand Applied
   a. Coiled tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by hand.
2. Tool Applied
   a. Steel cap, with conduction and corrosion resistant metallic plating, open at both ends, fitted around the twisted ends of the wire and compressed or crimped by means of a special die designed for the purpose. Specifically fitted plastic or rubber insulating cover wrap over each connector.

2.3 ELECTRICAL TAPE

A. Specifically designed for use as insulating tape.

2.4 LUBRICANT

A. Use lubricant only where the possibility of damage to conductors exists. Use only a lubricant approved by the cable manufacturer and one which is inert to cable and raceways.

PART 3 - EXECUTION

3.1 WIRE AND CABLE

A. Provide a complete system of conductors in raceway system. Mount wiring through a specified raceway, regardless of voltage application.

B. Drawings do not indicate size of branch circuit wiring. For branch circuits whose length from panel to furthest outlet exceeds 100 feet for 120-volt circuits, use number 10 or larger.

C. Do not install wire in incomplete conduit runs nor until after the concrete work and plastering is completed and moisture is swabbed from conduits. Eliminate splices wherever possible. Where necessary, splice in readily accessible pull, junction, or outlet.

D. Provide cable supports for all vertical risers where required by code.

E. Use terminating fittings, connectors, etc., of a type suitable for the specified cable furnished. Make bends in cable at termination prior to installing compression device. Make fittings tight.

F. Extend wire sizing for the entire length of a circuit, feeder, etc. unless specifically noted otherwise.

G. Provide a separate neutral conductor for each branch circuit. In the event a common neutral conductor is used, such as in furniture systems, the circuit breaker in the panelboard must be common trip for each phase that uses one neutral conductor.

END OF SECTION 260519

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Equipment shall be installed on hangers and supports as specified in this section of the specifications.

1.3 SUPPORTS

A. Support work in accordance with the best industry practice and the following.

B. Include supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets.

C. Nothing, (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported from heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fitting on two opposite sides.

D. Nothing shall rest on, or depend for support on, suspended ceilings media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling).

E. Provide required supports and hangers for conduit, equipment, etc., so that loading will not exceed allowable loadings of structure.

1.4 FASTENINGS

A. Fasten electric work to building structure in accordance with the best industry practice and the following:

B. As a minimum procedure, where weight applied to the attachment points is 100 pounds or less, fasten to building elements of:

1. Wood – with wood screws.
2. Concrete and solid masonry – with bolts and expansion shields.
3. Hollow Construction – with toggle bolts.
4. Solid metal – with machine screws in tapped holes or with welded studs.
5. Steel decking or subfloor – with fastenings as specified below for applied weights in excess of 100 pounds.

END OF SECTION 260529

SECTION 260533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide raceways in accordance with the Contract Documents.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
   1. Electrical Metallic Tubing – EMT
      a. UL Standard UL-797
      b. ANSI C80-3
      c. Federal Specification WW-C-563
   2. Flexible Metal Conduit – FMC
      a. UL Standard UL-1
   3. Metal Clad Cable – MC
      a. UL Standard 1581
      b. Federal Spec J-C-30B

PART 2 - PRODUCTS

2.1 RACEWAY TYPES

A. Electric Metallic Tubing – EMT

   1. Continuous, seamless tubing galvanized or sheradized on the exterior coated on the interior with a smooth hard finish of lacquer, varnish or enamel.
   2. All couplings, connectors, etc., used in conjunction with this raceway which are 2 inch in size and smaller shall be watertight compression type. EMT fittings shall be malleable iron zinc coated. With conduits of 2-1/2 inch in size and larger, set screw type couplings are permitted.

B. Flexible Metal Conduit – FMC

   1. Single strip, continuous, flexible interlocked double-wrapped steel, galvanized inside and outside forming smooth internal wiring channel.
   2. Maximum length: 6 feet.
   3. Each section of raceway must contain a bonding wire bonded at each end and sized as required. Provide connectors with insulating bushings.

C. Metal Clad Cable – MC

Non Health Care

1. Type MC cable shall be armored galvanized steel sheath cable with copper conductors and THHN 90 º insulation. Furnish with insulated grounding conductor.

2.2 OUTLET, JUNCTION AND PULLBOXES

A. Provide zinc-coated or cadmium-plated sheet steel outlet boxes not less than 4 inches octagonal or square, unless otherwise noted. Equip fixture outlet boxes with 3/8 inch no-bolt fixture studs where required. Where fixtures are mounted on or in an accessible type ceiling, provide a junction box and extend flexible conduit to each fixture. Fit outlet boxes in finished ceilings or walls with appropriate covers, set flush with the finished surface. Where more than one switch or device is located at one point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes will not be permitted. Provide Series "GW" (Steel City) tile box, or as accepted, or a 4 inch square box with tile ring in masonry walls which will not be plastered or furred. Where drywall material is utilized, provide plaster ring. Provide outlet boxes of the type and size suitable for the specific application. Where outlet boxes contain two or more 277 volt devices, or where devices occur of different applied voltages, or where normal and emergency devices occur in same box, provide suitable barrier.

B. Construct junction or pullboxes not over 150 cubic inches in size as standard outlet boxes, and those over 150 cubic inches the same as "cabinets" with screw covers of the same gauge metal.

C. Plug any open knockouts not utilized.

D. Provide surface mounted outlet and junction boxes in indoor locations where exposed to moisture and outdoor locations of cast metal with threaded hubs.

PART 3 - EXECUTION

3.1 APPLICATION OF RACEWAYS

A. The following applications must be adhered to except as otherwise required by Code. Raceway not conforming to this listing must be removed by this Contractor and replaced with the specified material at this Contractor's expense.

B.

Raceway Types	Application
Electrical Metallic Tubing EMT	Use in every instance except where another material is specified.
Flexible Metal Conduit – FMC	Use in dry areas for connections to lighting fixtures in hung ceilings, connections to equipment installed in removable panels of hung ceilings at all transformer or equipment raceway connections where sound and vibration isolation is required.

Metal-Clad Cable - MC	Use for branch circuit wiring above suspended ceilings or in metal stud walls. Cable shall not be run exposed. Home run wiring from panelboard to first outlet box shall be installed in conduit. MC cable not permitted for fire alarm wiring systems or emergency lighting.

3.2 RACEWAY SYSTEMS IN GENERAL

A. Provide raceways for all wiring systems unless noted otherwise. Minimum size 3/4 inch for home runs and 1 inch minimum for power distribution. Wiring of each type and system must be installed in separate raceways.

B. Locate raceways so that the strength of structural members is unaffected and they do not conflict with the services of other trades. Install 1 inch or larger raceways in or through structural members (beams, slabs, etc.) only when and in the manner accepted by the Architect. Draw up couplings and fittings full and tight. Protect threads from corrosion with one coat zinc chromate after installation.

C. Above Grade – Defined as the area above finished grade for a building exterior and above top surface of any slabs (or other concrete work) on grade for a building interior. Above-grade raceways to comply with the following:

1. Install raceways concealed except at surface cabinets and for motor and equipment connection in electrical and mechanical rooms. Install a minimum of 6 inches from flues, steam pipes, or other heated lines. Route raceways parallel or perpendicular to building lines with right-angle turns and symmetrical bends. Run embedded raceways in a direct line and, where possible, with long sweep bends and offsets. Provide sleeves in forms for new concrete walls, floor slabs and partitions for passage of raceways. Waterproof sleeved raceways where required.
2. Provide raceway expansion joints for exposed and concealed raceways with necessary bonding conductor at building expansion joints and between buildings or structures and where required to compensate for raceway or building thermal expansion and contraction.

D. Raceways in hung ceilings shall be run on and secured to slab or primary structural members of ceiling, not to lathing channels or T-bars or other elements which are the direct supports of the ceiling panels. Secure conduit firmly to steel by clips and fittings designed for that purpose. Install as high as possible, but not less than, 1-0" above hung ceilings.

E. Exposed raceways shall be run parallel or at right angles with building lines. Secure raceway clamps or supports to masonry materials by toggle bolts, expansion bolts, or steel inserts. Install raceway on steel construction with approved clamps which do not depend on friction or set-screw pressure alone.

F. Clear raceway of all obstructions and dirt prior to pulling in wires or cables. This shall be done with ball mandrel (diameter approximately 85% of conduit inside diameter) followed by close fitting wire brush and wad of felt or similar material. This assembly may be pulled in together with, but ahead of the cable being installed. All empty raceways shall be similarly cleaned. Clear any raceway which rejects ball mandrel.

G. Support less than 1 inch trade size horizontally run, raceways at intervals not greater than 7 feet. Support such raceways, 1 inch trade size or larger, at intervals no greater than 10 feet.

3.3 OUTLET, JUNCTION, AND PULLBOXES

A. Provide outlet, junction, and pullboxes as indicated on the Drawings and as required for the complete installation of the various electrical systems, and to facilitate proper pulling of wires and cables. J-boxes and pullboxes shall be sized per NEC minimum.

B. The exact location of outlets and equipment is governed by structural conditions and obstructions or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to the room layout and will not interfere with other work or equipment. Verify final location of outlets, panels equipment, etc., with Architect.

C. Back-to-back outlets in the same wall or "thru-wall" type boxes are not permitted. Provide 12 inch (minimum) spacing for outlets shown on opposite sides of a common wall to minimize sound transmission.

END OF SECTION 260533

SECTION 265100

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes, but is not necessarily limited to, the furnishing and installation of all lighting as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the work.

B. Major items:

1. Interior lighting fixtures
2. Emergency lighting
3. Exit lighting
4. Adequate fixture support systems.

1.2 STANDARDS

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. NFPA
a. 70 – NEC
b. 101 – Life Safety

1.3 FIXTURE SCHEDULE

A. No substitutions will be accepted after bids are received. The lighting equipment specified herein has been carefully chosen for its ability to meet luminous performance requirements of this project. Substitutions in all likelihood will be unable to meet all of the same criteria as specified equipment. No exceptions.

B. When only one manufacturer is listed within the description of the luminaire, the design engineering of architectural aesthetics will not allow substitution of another manufacturer. The contractor shall provide a separate list of unit costs for these luminaires with shop drawings. Shop drawings will not be reviewed without unit cost information.

C. When one or more manufacturers and the words "or equivalent" appear within the fixture description, the Contractor may elect to submit to Engineer a substitute fixture for review. All submittals must be made within 14 days prior to the bid date to provide ample time for review and to issue an addendum incorporating the substitution.

D. Substitution submittals shall consist of a physical description, dimensioned drawing and complete photometric and electric data of the proposed lamp and luminare. Working samples of lamp and luminaire substitutions must also be supplied for visual check of finish and operating characteristics. Photometric reports must list the actual candela values for the luminaire's distribution in at least three planes. Candela curves, footcandle and lumen tables and iso-footcandle contours are not acceptable. No substitutions will be considered without compliance with the paragraph. Contractor will be responsible for all cost, (engineering time, manufacturer's costs, distributor costs) incurred to replace equipment not approved if substitutions are made by the distributor, manufacturers representative, or subcontractor.

E. Once Bids, Shop Drawings are approved, all lighting is to be ordered in a timely manner. The Contractor is then to inform the Engineer immediately, in writing, the date when equipment orders are completed and delivery scheduled.

1.4 SUBMITTALS

A. Submit shop drawings and manufacturers' data for the following items in accordance with the conditions of the contract and as specified below.

1. Major luminaires and special luminaires shall show full size cross sections. Indicate finished dimensions, metal thicknesses, and materials.
2. Show mounting details, including hung ceiling construction.
3. Shop drawings shall include a complete listing of all luminaires on a single sheet. This listing shall contain the luminaire type, manufacturer's catalog number, applied voltage, lamps and ballasts.
4. Submit manufacturer's fixtures and accessories Shop Drawings and data in booklet form, including rough-in dimensions, instructions for installation and maintenance.

1.5 PROTECTION

A. Protect lighting fixtures and work against dirt, water or mechanical damage before, during, and after installation. Damage to fixtures prior to final acceptance shall be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS AND FIXTURES

A. General

1. Provide all lighting fixtures in accordance with Lighting Fixture Schedule and as indicated and required on Drawings.
2. Fixture catalog numbers only indicates type and style. Provide each fixture complete with proper fixture trim, levelers, mounting brackets, flanges, plaster rings, glassware and accessories for complete installation as required for type of ceiling and room finish schedules.

3. Provide gaskets as required to prevent light spill between frames and ceilings.
4. Provide continuity of ground on all fixtures used as raceways and mounted end to end.
5. All metal parts to be chemically treated with a rust resistant phosphatized solution, reflecting surfaces to have a factor of minimum 90%.
6. Provide luminaires, completely factory-assembled and wired and equipped with necessary sockets, ballasts, wiring, shielding, reflectors, channels, lenses, etc., and deliver to job ready for installation.
7. Luminaire Wiring: Minimum individual luminaire wiring – number 18 gauge with insulation with rated operating temperature of 105 degrees Centigrade or higher. Terminate wiring for recessed luminaires, except fluorescent units, in an external splice box.
8. Recessed luminaires shall be furnished with thermal protection in accordance with Article 410-65 of the NEC.
9. Where utilized as raceway, luminaires shall be suitable for use as raceways. Provide feed through splice boxes where necessary. Wiring shall be rated for 90 degrees Centigrade.

B. Exit Lighting

1. Exit lighting system shall be as indicated on Drawings.
2. Equipment shall be complete with lamps.
3. Where indicated as such, provide battery pack and charger for illumination under power failure conditions.
4. Equipment shall meet BOCA, OSHA, NFPA and NEC illumination standards.

2.2 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel and angle-iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. General
1. Install outlets, surface mounted, recessed or semi-recessed fixtures to maintain the alignment, spacings, layout and general arrangements indicated in the Drawings. Obtain approval of Engineer for all changes in layout required to avoid interferences with other trades.

B. Coordination

1. Work incorporating with ceiling trades in locating and framing recessed fixtures in acoustical tile pattern or grid system to conform to layout.
2. Inform affected trades of the location and framing details necessary for the installation of flush fixtures and deliver all framing rings of these fixtures that become a part of the ceiling construction.

3. Before equipment is ordered, electrical contractor to review luminaire and ceiling mechanical compatibility in each area and verify luminaire on the drawings. Contractor shall be responsible for all fixture quantities, lengths and clearances required and shall inform the ARCHITECT of the job conditions at variance with the fixture(s) specified or detailed which affect installation or location. (All stages of installation.)
4. Mechanical and electrical contractors are to review and coordinate lighting locations in relationship to mechanical systems to minimize conflicts prior to installation. Electrical contractor is to submit a written memo with minutes of these meetings to both the Architect and Engineer.
5. This contractor is responsible for coordinating the characteristics and the U.L. labeling of the luminaires and their components with the ambient conditions, which will exist when the luminaires are installed. No extra compensation will be permitted for failure to coordinate the luminaires with their ambient conditions.

C. Mounting and Supports
1. Where luminaires are mounted on surface-mounted outlet boxes in surface mounted conduit runs, this Contractor shall furnish and install a luminaire canopy sufficiently deep to permit exposed conduits to pass through. Canopy shall have proper openings cut by luminaire manufacturer through which conduits may pass. Submit sample of canopy for approval before installation.
2. Prior to final payment, this contractor shall clean all luminaires and replace all lamps. He shall also touch up all scratch marks, etc. in an approved manner.
3. Recessed luminaires to be installed in metal panel or acoustic modular ceilings shall be modified as required to fit into openings in ceiling construction. This contractor shall coordinate and verify this work with the General Construction Contractor. Shop Drawings showing details shall be submitted for approval.
4. All luminaires in hung ceilings are to be installed with earthquake clips.

3.2 ADJUSTING AND CLEANING

A. At project completion, before final approval:

1. Aim adjustable fixtures as directed and observe and adjust at night as required.
2. Clean interior of all fixtures, all lenses and lamps.

END OF SECTION 265100

SECTION 281300

ACCESS CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes a security access system consisting of field-installed Controllers connected by a high-speed electronic data transmission network. The security access system shall have the following:

1. Access Control:

a. Regulating access through doors.
b. Anti-passback.
c. Visitor assignment.
d. Credential cards and readers.
e. Monitoring of field-installed devices.
f. Reporting.

1.2 SYSTEM DESCRIPTION

A. System shall consist of connections to existing Central Station, and field-installed Controllers, connected by a high-speed electronic data transmission network.

B. Network(s) connecting PCs and Controllers shall consist of one or more of the following:

1. Local area, IEEE 802.3 Fast Ethernet 10 BASE-T star topology network based on TCP/IP.

C. System Network Requirements:

1. Interconnect system components and provide automatic communication of status changes, commands, field-initiated interrupts, and other communications required for proper system operation.
2. Communication shall not require operator initiation or response, and shall return to normal after partial or total network interruption such as power loss or transient upset.
3. System shall automatically annunciate communication failures to the operator and identify the communication link that has experienced a partial or total failure.
4. Communications Controller may be used as an interface between the Central Station display systems and the field device network. Communications Controller shall provide functions required to attain the specified network communications performance.

D. Field equipment shall include Controllers, sensors, and controls. Controllers shall serve as an interface between the Central Station and sensors and controls. Data exchange between the Central Station and the Controllers shall include down-line transmission of commands,

software, and databases to Controllers. The up-line data exchange from the Controller to the Central Station shall include status data such as intrusion alarms, status reports, and entry-control records. Controllers are classified as alarm-annunciation or entry-control type.

E. Error Detection: A cyclic code error detection method shall be used between Controllers and the existing Central Station, which shall detect single- and double-bit errors, burst errors of eight bits or less, and at least 99 percent of all other multibit and burst error conditions. Interactive or product error detection codes alone will not be acceptable.

F. Door Hardware Interface: Coordinate with Division 08 Sections that specify door hardware required to be monitored or controlled by the security access system. The Controllers in this Section shall have electrical characteristics that match the signal and power requirements of door hardware. Integrate door hardware specified in Division 08 Sections to function with the controls and PC-based software and hardware in this Section.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include operating characteristics, furnished specialties, and accessories. Reference each product to a location on Drawings. Test and evaluation data presented in Product Data shall comply with SIA BIO-01.

B. Shop Drawings:

1. Diagrams for cable management system.
2. System labeling schedules, including electronic copy of labeling schedules that are part of the cable and asset identification system of the software specified in Parts 2 and 3.
3. Wiring Diagrams. Show typical wiring schematics including the following:

    a. Outlets, jacks, and jack assemblies.

C. Project planning documents as specified in Part 3.

D. Field quality-control test reports.

1. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70, "National Electrical Code."

C. Comply with SIA DC-01 and SIA DC-03.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with existing system requirements and manufacturer.

B. Controller Software:

1. Controllers shall operate as an autonomous intelligent processing unit. Controllers shall make decisions about access control, alarm monitoring, linking functions, and door locking schedules for its operation, independent of other system components. Controllers shall be part of a fully distributed processing control network. The portion of the database associated with a Controller and consisting of parameters, constraints, and the latest value or status of points connected to that Controller, shall be maintained in the Controller.
2. Functions: The following functions shall be fully implemented and operational within each Controller:

    a. Monitoring inputs.
    b. Controlling outputs.
    c. Automatically reporting alarms to the existing Central Station.
    d. Reporting of sensor and output status to existing Central Station on request.
    e. Maintaining real time, automatically updated by the existing Central Station at least once a day.
    f. Communicating with the existing Central Station.
    g. Executing Controller resident programs.
    h. Diagnosing.
    i. Downloading and uploading data to and from the existing Central Station.

3. Controller Operations at a Location:

    a. Location: Up to 64 Controllers connected to RS-485 communications loop. Globally operating I/O linking and anti-passback functions between Controllers within the same Location without central-station intervention. Linking and anti-passback shall remain fully functional within the same Location even when the Central Station is off line.
    b. In the event of communications failure between the Central Station and a Location, there shall be no degradation in operations at the Controllers at that Location. The Controllers at each Location shall be connected to a memory buffer with a capacity to store up to 10,000 events; there shall be no loss of transactions in system history files until the buffer overflows.
    c. Buffered events shall be handled in a first-in-first-out mode of operation.

4. Individual Controller Operation:

    a. Controllers shall transmit alarms, status changes, and other data to the Central Station when communications circuits are operable. If communications are not available, Controllers shall function in a stand-alone mode and operational data, including the status and alarm data normally transmitted to the Central Station,

shall be stored for later transmission to the Central Station. Storage capacity for the latest 1024 events shall be provided at each Controller.

b. Card-reader ports of a Controller shall be custom configurable for at least 120 different card-reader or keypad formats. Multiple reader or keypad formats may be used simultaneously at different Controllers or within the same Controller.
c. Controllers shall provide a response to card-readers or keypad entries in less than 0.25 seconds, regardless of system size.
d. Controllers that are reset, or powered up from a nonpowered state, shall automatically request a parameter download and reboot to its proper working state. This shall happen without any operator intervention.
e. Initial Startup: When Controllers are brought on-line, database parameters shall be automatically downloaded to them. After initial download is completed, only database changes shall be downloaded to each Controller.
f. Failure Mode: On failure for any reason, Controllers shall perform an orderly shutdown and force Controller outputs to a predetermined failure mode state, consistent with the failure modes shown and the associated control device.
g. Startup After Power Failure: After power is restored, startup software shall initiate self-test diagnostic routines, after which Controllers shall resume normal operation.
h. Startup After Controller Failure: On failure, if the database and application software are no longer resident, Controllers shall not restart, but shall remain in the failure mode until repaired. If database and application programs are resident, Controllers shall immediately resume operation. If not, software shall be restored automatically from the Central Station.

5. Communications Monitoring:

a. System shall monitor and report status of RS-485 communications loop of each Location.
b. Communication status window shall display which Controllers are currently communicating, a total count of missed polls since midnight, and which Controller last missed a poll.
c. Communication status window shall show the type of CPU, the type of I/O board, and the amount of RAM memory for each Controller.

6. Operating systems shall include a real-time clock function that maintains seconds, minutes, hours, day, date, and month. The real-time clock shall be automatically synchronized with the Central Station at least once a day to plus or minus 10 seconds. The time synchronization shall be automatic, without operator action and without requiring system shutdown.

C. PC-to-Controller Communications:

1. Central-station communications shall use the following:

a. Direct connection using serial ports of the PC.
b. TCP/IP LAN network interface cards.

2. Serial Port Configuration: Each serial port used for communications shall be individually configurable for "direct communications," "modem communications incoming and outgoing," or "modem communications incoming only"; or as an ASCII output port.

3. Multiport Communications Board: Use if more than two serial ports are needed.

    a. Expandable and modular design. Use a 4-, 8-, or 16-serial port configuration that is expandable to 32 or 64 serial ports.
    b. Connect the first board to an internal PCI bus adapter card.

4. Direct serial, TCP/IP, and dial-up communications shall be alike in the monitoring or control of system, except for the connection that must first be made to a dial-up Location.
5. TCP/IP network interface card shall have an option to set the poll frequency and message response time-out settings.
6. PC-to-Controller and Controller-to-Controller communications (direct, dial-up, or TCP/IP) shall use a polled-communication protocol that checks sum and acknowledges each message. All communications shall be verified and buffered and retransmitted if not acknowledged.

D. Controller-to-Controller Communications:

1. Controller-to-Controller Communications: RS-485, 4-wire, point-to-point, regenerative (repeater) communications network methodology.
2. RS-485 communications signal shall be regenerated at each Controller.

2.2 CONTROLLERS

A. Controllers: Intelligent peripheral control unit, complying with UL 294, that stores time, date, valid codes, access levels, and similar data downloaded from the existing Central Station for controlling its operation.

B. Subject to compliance with requirements in this Article, manufacturers may use multipurpose Controllers.

C. Entry-Control Controller:

1. Function: Provide local entry-control functions including one- and two-way communications with access-control devices such as card readers, biometric personal identity verification devices, door strikes, magnetic latches, and door operators.

    a. Operate as a stand-alone portal Controller using the downloaded database during periods of communication loss between the Controller and the field-device network.
    b. Accept information generated by the entry-control devices; automatically process this information to determine valid identification of the individual present at the portal:

        1) On authentication of the credentials or information presented, check privileges of the identified individual, allowing only those actions granted as privileges.
        2) Privileges shall include, but not be limited to, time of day control, day of week control, group control, and visitor escort control.

c. Maintain a date-, time-, and Location-stamped record of each transaction. A transaction is defined as any successful or unsuccessful attempt to gain access through a controlled portal by the presentation of credentials or other identifying information.

2. Inputs:

a. Data from entry-control devices; use this input to change modes between access and secure.
b. Database downloads and updates from the existing Central Station that include enrollment and privilege information.

3. Outputs:

a. Indicate success or failure of attempts to use entry-control devices and make comparisons of presented information with stored identification information.
b. Grant or deny entry by sending control signals to portal-control devices.
c. Maintain a date-, time-, and Location-stamped record of each transaction and transmit transaction records to the existing Central Station.
d. Door Prop Alarm: If a portal is held open for longer than 20 seconds, alarm sounds.

4. With power supplies sufficient to power at voltage and frequency required for field devices and portal-control devices.
5. Data Line Problems: For periods of loss of communications with Central Station, or when data transmission is degraded and generating continuous checksum errors, the Controller shall continue to control entry by accepting identifying information, making authentication decisions, checking privileges, and controlling portal-control devices.

a. Store up to 1000 transactions during periods of communication loss between the Controller and access-control devices for subsequent upload to the Central Station on restoration of communication.

6. Controller Power: NFPA 70, Class II power supply transformer, with 12- or 24-V ac secondary, backup battery and charger.

a. Backup Battery: Premium, valve-regulated, recombinant-sealed, lead-calcium battery; spill proof; with a full 1-year warranty and a pro rata 19-year warranty. With single-stage, constant-voltage-current, limited battery charger, comply with battery manufacturer's written instructions for battery terminal voltage and charging current recommendations for maximum battery life.
b. Backup Power Supply Capacity: 90 minutes of battery supply. Submit battery and charger calculations.
c. Power Monitoring: Provide manual dynamic battery load test, initiated and monitored at the control center; with automatic disconnection of the Controller when battery voltage drops below Controller limits. Report by using local Controller-mounted LEDs and by communicating status to Central Station. Indicate normal power on and battery charger on trickle charge. Indicate and report the following:

1) Trouble Alarm: Normal power off load assumed by battery.

2) Trouble Alarm: Low battery.
3) Alarm: Power off.

2.3 CARD READERS

A. Power: Card reader shall be powered from its associated Controller, including its standby power source.

B. Response Time: Card reader shall respond to passage requests by generating a signal that is sent to the Controller. Response time shall be 800 ms or less, from the time the card reader finishes reading the credential card until a response signal is generated.

C. Enclosure: Suitable for surface, semiflush, or pedestal mounting. Mounting types shall additionally be suitable for installation in the following locations:

1. Indoors, controlled environment.
2. Indoors, uncontrolled environment.
3. Outdoors, with built-in heaters or other cold-weather equipment to extend the operating temperature range as needed for operation at the site.

D. Display: LED or other type of visual indicator display shall provide visual status indications and user prompts. Indicate power on/off, whether user passage requests have been accepted or rejected, and whether the door is locked or unlocked.

E. Touch Plate and Proximity Readers:

1. Active detection proximity card readers shall provide power to compatible credential cards through magnetic induction, and shall receive and decode a unique identification code number transmitted from the credential card.
2. Passive detection proximity card readers shall use a swept-frequency, RF field generator to read the resonant frequencies of tuned circuits laminated into compatible credential cards. The resonant frequencies read shall constitute a unique identification code number.
3. The card reader shall read proximity cards in a range from contact with to at least 6 inches (150 mm) from the reader.

2.4 DOOR AND GATE HARDWARE INTERFACE

A. Exit Device with Alarm: Operation of the exit device shall generate an alarm and annunciate a local alarm. Exit device and alarm contacts are specified in Division 08 Section "Door Hardware."

B. Electric Door Strikes: Use end-of-line resistors to provide power line supervision. Signal switches shall transmit data to Controller to indicate when the bolt is not engaged and the strike mechanism is unlocked, and shall report a forced entry. Power and signal shall be from the Controller. Electric strikes are specified in Division 08 Section "Door Hardware."

C. Electromagnetic Locks: End-of-line resistors shall provide power line supervision. Lock status sensing signal shall positively indicate door is secure. Power and signal shall be from the Controller. Electromagnetic locks are specified in Division 08 Section "Door Hardware."

2.5 TRANSFORMERS

A. NFPA 70, Class II control transformers, NRTL listed. Transformers for security access-control system shall not be shared with any other system.

2.6 CABLE AND ASSET MANAGEMENT

A. Manufacturers:

1. IMAP Textron; Division of Greenlee Textron.
2. Total Wire Software Company, Inc.

B. Computer-based cable and asset management system, with fully integrated database and graphic capabilities, complying with requirements in TIA/EIA-606.

1. Document physical characteristics by recording the network, asset, user, TIA/EAI details, device configurations, and exact connections between equipment and cabling.

a. Manage the physical layer of security system.
b. List device configurations.
c. List and display circuit connections.
d. Record firestopping data.
e. Record grounding and bonding connections and test data.

2. Information shall be presented in database view, schematic plans, or technical drawings.

a. Microsoft Visio Technical Drawing shall be used as drawing and schematic plans software. Drawing symbols, system layout, and design shall comply with SIA AG-01.

3. System shall interface with the following testing and recording devices:

a. Direct upload tests from circuit testing instrument into the PC.
b. Direct download circuit labeling into labeling printer.

C. Software shall be designed for Microsoft Windows of same version as security access system's Central Station shall be installed on the designated PC, using a hard drive dedicated only to this management function. Hard-drive capacity shall be not less than [50] <Insert number> GB.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in SIA CP-01.

B. Comply with EIA/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings."

C. Obtain detailed Project planning forms from manufacturer of access-control system; develop custom forms to suit Project. Fill in all data available from Project plans and specifications and publish as Project planning documents for review and approval.

1. Record setup data for control station.
2. For each Location, record setup of Controller features and access requirements.
3. Propose start and stop times for time zones and holidays, and match up access levels for doors.
4. Set up groups, facility codes, linking, and list inputs and outputs for each Controller.
5. Assign action message names and compose messages.
6. Set up alarms. Establish interlocks between alarms, intruder detection, and video surveillance features.
7. Prepare and install alarm graphic maps.
8. Develop user-defined fields.
9. Develop screen layout formats.
10. Propose setups for guard tours and key control.
11. Discuss badge layout options; design badges.
12. Complete system diagnostics and operation verification.
13. Prepare a specific plan for system testing, startup, and demonstration.
14. Develop acceptance test concept and, on approval, develop specifics of the test.
15. Develop cable and asset management system details; input data from construction documents. Include system schematics and Visio Technical Drawings.

D. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final setup documents. Use final documents to set up system software.

3.2 CABLING

A. Comply with NECA 1, "Good Workmanship in Electrical Contracting."

B. Install cables and wiring according to requirements in Division 28 Section "Conductors and Cables for Electronic Safety and Security."

C. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

D. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.

E. Install LAN cables using techniques, practices, and methods that are consistent with Category 5E rating of components and that ensure Category 5E performance of completed and linked signal paths, end to end.

F. Install cables without damaging conductors, shield, or jacket.

G. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

H. Install end-of-line resistors at the field device location and not at the Controller or panel location.

3.3 CABLE APPLICATION

A. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."

B. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.

C. RS-485 Cabling: Install at a maximum distance of 4000 feet (1220 m).

D. Card Readers and Keypads:

1. Install number of conductor pairs recommended by manufacturer for the functions specified.
2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from Controller to the reader is 250 feet (75 m), and install No. 20 AWG wire if maximum distance is 500 feet (150 m).
3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the Controller.
4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

E. Install minimum No. 16 AWG cable from Controller to electrically powered locks. Do not exceed 250 feet (75 m).

F. Install minimum No. 18 AWG ac power wire from transformer to Controller, with a maximum distance of 25 feet (8 m).

3.4 GROUNDING

A. Comply with Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."

C. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

D. Bond shields and drain conductors to ground at only one point in each circuit.

E. Signal Ground:

1. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
2. Bus: Mount on wall of main equipment room with standoff insulators.
3. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.

3.5 INSTALLATION

A. Push Buttons: Where multiple push buttons are housed within a single switch enclosure, they shall be stacked vertically with each push-button switch labeled with 1/4-inch- (6.4-mm-) high text and symbols as required. Push-button switches shall be connected to the Controller associated with the portal to which they are applied, and shall operate the appropriate electric strike, electric bolt, or other facility release device.

B. Install card, fob, and biometric readers.

3.6 IDENTIFICATION

A. In addition to requirements in this Article, comply with applicable requirements in Division 26 Section "Identification for Electrical Systems" and with TIA/EIA-606.

B. Using cable and asset management software specified in Part 2, develop Cable Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable and jacks, connectors, and terminals to which it connects with same designation. Use logical and systematic designations for facility's architectural arrangement.

C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

1. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the particular device as shown.
2. Each wire connected to building-mounted devices is not required to be numbered at the device if the color of the wire is consistent with the associated wire connected and numbered within the panel or cabinet.

D. At completion, cable and asset management software shall reflect as-built conditions.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 5 tester. Test for faulty

connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.

2. Test each circuit and component of each system. Tests shall include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

3.8 STARTUP SERVICE

A. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in " Preparation" Article and with manufacturer's written instructions.

1. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.9 PROTECTION

A. Maintain strict security during the installation of equipment and software. Room housing the control station that has been powered up shall be locked and secured, with an activated burglar alarm and access-control system reporting to a Central Station complying with UL 1610, "Central-Station Burglar-Alarm Units," during periods when a qualified operator in the employ of Contractor is not present.

END OF SECTION 281300

SECTION 282300

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes video surveillance system consisting of cameras, data transmission wiring, and a control station with its associated equipment.

B. Video surveillance system shall be integrated with monitoring and control system specified in Division 28 Section "Access Control" that specifies systems integration.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, including dimensions and data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.

1. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
2. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
3. UPS: Sizing calculations.
4. Wiring Diagrams: Power, signal, and control wiring, and grounding.

C. Equipment List: Include every piece of equipment by model number, manufacturer, serial number, location, and date of original installation.

1. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
2. Detailed description of equipment anchorage devices on which the certification is based.

D. Field quality-control test reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NECA 1.

C. Comply with NFPA 70.

D. Electronic data exchange between video surveillance systems with an access control system shall comply with SIA TVAC.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Interior, Controlled Environment: System components, except central-station control unit, installed in temperature-controlled interior environments shall be rated for continuous operation in ambient temperatures of [**36 to 122 deg F (2 to 50 deg C)**] dry bulb and 20 to 90 percent relative humidity, noncondensing. NEMA 250, Type 1 enclosures.
2. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with existing system requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the existing manufacturers specified.

2.2 SYSTEM REQUIREMENTS

A. Video signal format shall comply with the NTSC standard composite video, interlaced. Composite video signal termination shall be 75 ohms.

B. Surge Protection: Protect components from voltage surges entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
1. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with manufacturer's recommendation for type of line being protected.

2.3 STANDARD CAMERAS

A. Manufacturers: subject to compliance to existing system.

B. Color Camera:

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 771(H) by 492(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions.
7. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
8. Manually selectable modes for backlight compensation or normal lighting.
9. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
10. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
11. Motion Detector: Built-in digital.

C. Automatic Color Dome Camera: Assembled and tested as a manufactured unit, containing a dome assembly, color camera, motorized pan and tilt, zoom lens, and receiver/driver.

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 768(H) by 494(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
7. Manually selectable modes for backlight compensation or normal lighting.
8. Pan and Tilt: Direct-drive motor, 360-degree rotation angle, and 180-degree tilt angle. Pan-and-tilt speed shall be variable controlled by operator. Movement from preset positions shall be not less than 300 degrees per second.
9. Preset Positioning: 8 user-definable scenes, each allowing 16-character titles. Controls shall include the following:

    a. In "sequence mode," camera shall continuously sequence through preset positions, with dwell time and sequencing under operator control.
    b. Motion detection shall be available at each camera position.
    c. Up to four preset positions may be selected to be activated by an alarm. Each of the alarm positions may be programmed to output a response signal.

10. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
11. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
12. Motion Detector: Built-in digital.

13. Dome shall support multiplexed control communications using coaxial cable recommended by manufacturer.

2.4 LENSES

A. Manufacturers: Subject to compliance of existing system.

B. Description: Optical-quality coated optics, designed specifically for video surveillance applications, and matched to specified camera. Provide color-corrected lenses.

1. Auto-Iris Lens: Electrically controlled iris with circuit set to maintain a constant video level in varying lighting conditions.
2. Fixed Lenses: With calibrated focus ring.
3. Zoom Lenses: Motorized, remote-controlled units, rated as "quiet operating." Features include the following:

    a. Electrical Leads: Filtered to minimize video signal interference.
    b. Motor Speed: Variable.
    c. Lens shall be available with preset positioning capability to recall the position of specific scenes.

2.5 POWER SUPPLIES

A. Power Supplies: Type as recommended by camera and lens manufacturer.

1. Enclosure: NEMA 250, Type 1.

2.6 CAMERA-SUPPORTING EQUIPMENT

A. Manufacturers: Subject to compliance of existing system.

B. Minimum Load Rating: Rated for load in excess of the total weight supported times a minimum safety factor of two.

C. Pan-and-Tilt Units: Motorized units arranged to provide remote-controlled aiming of cameras with smooth and silent operation and equipped with matching mounting brackets.

1. Panning Rotation: 0 to 355 degrees, with adjustable stops.
2. Tilt Movement: 90 degrees, plus or minus 5 degrees, with adjustable stops.
3. Speed: 12 degrees per second in both horizontal and vertical planes.
4. Wiring: Factory prewired for camera and zoom lens functions and pan-and-tilt power and control.
5. Built-in encoders or potentiometers for position feedback.
6. Pan-and-tilt unit shall be available with preset positioning capability to recall the position of a specific scene.

D. Mounting Brackets for Fixed Cameras: Type matched to items supported and mounting conditions. Include manual pan-and-tilt adjustment.

E. Protective Housings for Fixed and Movable Cameras: Steel enclosures with internal camera mounting and connecting provisions.

1. Tamper switch on access cover sounds an alarm signal when unit is opened or partially disassembled. Central-control unit shall identify tamper alarms and indicate location in alarm display. Tamper switches and central-control unit are specified in Division 28 Section "Intrusion Detection."
2. Camera Viewing Window: Polycarbonate window, aligned with camera lens.
3. Duplex Receptacle: Internally mounted.
4. Alignment Provisions: Camera mounting shall provide for field aiming of camera and permit removal and reinstallation of camera lens without disturbing camera alignment.
5. With sun shield that does not interfere with normal airflow around the housing.
6. Mounting bracket and hardware for wall or ceiling mounting of the housing. Bracket shall be of same material as the housing; mounting hardware shall be stainless steel.
7. Finish: Housing and mounting bracket shall be factory finished using manufacturer's standard finishing process suitable for the environment.
8. Enclosure Rating: IEC 60529, IP 52

2.7 COLOR MONITORS

A. Manufacturers: Subject to compliance of existing system.

B. Screen Size (Diagonal Dimension): 42”

C. Horizontal Resolution: 300 lines.

D. Minimum Front Panel Devices and Controls: Power switch, power-on indicator, and brightness, contrast, color, and tint controls.

E. Degaussing: Automatic.

F. Electrical: 120-V ac, 60 Hz.

2.8 SIGNAL TRANSMISSION COMPONENTS

A. Cable: Coaxial cable elements have 75-ohms nominal impedance. Cables shall comply with Division 27 Section "Master Antenna Television System."

B. Video Surveillance Coaxial Cable Connectors: BNC type, 75 ohms. Of three-piece construction, consisting of a crimp-type center tit, sleeve, and main body.

PART 3 - EXECUTION

3.1 WIRING

A. Wiring Method: Install cables in raceways, except in accessible indoor ceiling spaces**,** and as otherwise indicated. Conceal raceways and wiring except in unfinished spaces.

B. Wiring Method: Install cables concealed in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train conductors. Provide and use lacing bars and distribution spools.

D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

E. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.2 VIDEO SURVEILLANCE SYSTEM INSTALLATION

A. Install cameras with 84-inch- (2134-mm-) minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.

B. Set pan-and-tilt unit stops to suit final camera position and to obtain the field of view required for camera. Connect all controls and alarms, and adjust.

C. Avoid ground loops by making ground connections at only the control station.

1. For 12- and 24-V dc cameras, connect the coaxial cable shields only at the monitor end.

D. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation and supervise pretesting, testing, and adjusting of video surveillance equipment.

B. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video surveillance equipment for acceptance and operational testing as follows:

1. Verify operation of auto-iris lenses.

2. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
3. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 50 to 75 feet (17 to 23 m) away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
4. Set and name all preset positions; consult Owner's personnel.
5. Set sensitivity of motion detection.
6. Connect and verify responses to alarms.
7. Verify operation of control-station equipment.

C. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.

D. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation.

E. Record test results for each piece of equipment.

F. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

END OF SECTION 282300

New Security Vestibule at

Catoctin High School

Sabillasville Road –
Thurmont, Maryland

May 15, 2018

Bidding Documents
FCPS Bid #??

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New Security Vestibule for
Catoctin High School
Thurmont, Maryland

Proj. #15-30.03 Construction Documents

SECTION 01 10 00

GENERAL REQUIREMENTS

SECTION 01 10 00 - GENERAL REQUIREMENTS

PART 1 – GENERAL

1.1 SUMMARY OF WORK

Furnish all labor, materials, equipment, and services necessary for, incidental to, the construction of a Security Vestibule at the interior of Catoctin High School. All work shall be bid as lump sum as indicated on the drawing and specifications as prepared by Proffitt and Associates. Work shall be coordinated with the Owner. Work is to be completed at a time frame dictated by the Owner's Representative when the area will be available for work. Work is further described as follows:

A. The existing school building consists of a single story structure with steel frame and non-load bearing masonry construction.

Work includes removal of interior hollow metal doors/frames and windows and partial removal of non-bearing masonry walls as shown on the drawings. The new vestibule compartment will be primarily constructed with an aluminum storefront system with entrance doors and side lights. Work associated with secondary finishes systems such as gypsum board on metal studs, flooring, painting, and acoustical ceilings will also be included.

Work also includes installation of access control door hardware and associated security devices.

Minor modifications to Mechanical and Electrical systems to support the vestibule and associated upgrades to the existing Admin. Office is required.

Additional Structural and Masonry work is not required.

B. All work is indicated on the contract documents and is limited to Architectural work with some minor Mechanical and Electrical work**.**

1. Contractor shall provide a detailed schedule of values for all work included in the project broken down by trade.

C. The Owner will continue to conduct limited operations in this facility during construction and renovation. The General Contractor shall coordinate all phasing aspects with the owner to ensure that existing public areas and egress components can be used to the greatest extent possible during construction operations, and to maintain building security.

1.2 LOCAL CONDITIONS

A. The contractor shall check, measure and verify all site conditions and be responsible for familiarizing themselves with the nature, extent and quantity of the work. Where drawings or specifications conflict with existing field conditions, Contractor shall

notify the Owner's Representative. The Owner will then give written directions and or clarifications on how to proceed.

B. The Contractor is responsible for verification of all utility locations and the repair of same if damaged during construction. The Contractor shall restore to the original condition all damages due to construction.

1.3 APPLICABLE CODES AND STANDARDS

A. All work shall conform to all applicable local, state or federal building codes, regulations and 2010 A.D.A. regulatory requirements.

1.4 INQUIRIES

A. All inquiries pertaining to this project shall be made to Mr. Brad Ahalt, Project Manager for FCPS Construct Management Dept, Frederick County Public Schools, phone 301-644-5164. Email: bradley.ahalt@fcps.org.

1. Mr. Brad Ahalt will serve as the Owner's Representative.

B. The site is available for inspection prior to bid by calling the Project Manager to make arrangements to coordinate a site visit that doesn't interfere with business activities.

1.5 OPENING

A. Proposals will be opened as announced in the "Invitation to Bid."

1.6 AWARD OF BID

A. The Contract will be awarded as stated in the "Instructions to Bidders."
In addition, Frederick County Public Schools reserves the right to accept or reject any or all proposals for any reason whatsoever and will not be responsible for any charges incurred by contractors.

1.7 SCHEDULE OF WORK

A. Demolition/construction work to begin on or about June ??, 2018 with substantial completion of base bid work by August ??, 2018. Final completion date of base bid work is September ??, 2018.

B. The contractor has full access to the building as necessary during the above timeline 7 days a week and as allowed by local ordinances. Once staff return for the fall term access will be restricted to comply with the instructional schedule.

C. FCPS is on 4 day 10 hour work week over the summer recess; there will be no staff on site Friday, Saturday or Sunday from mid-June to Mid-August however FCPS will make accommodations for access during those days as necessary.

1.8 LIQUIDATED DAMAGES

A. Liquidated damages in the amount of $475.00 per day for each calendar day beyond completion date of August ??, 2018 will be assessed by the Owner.

1.9 SPECIAL CONDITIONS

A. Asbestos- Containing Buildings:
Although, most Frederick County Public School buildings contain asbestos, it is not anticipated that any ACM's (Asbestos Containing Materials) will be encountered as part of this work. At the pre-construction meeting a detailed procedure of asbestos removal (should any be encountered in the building) will be given to the contractor.

B. Protect the structure, furnishings, finishes, and adjacent materials not indicated or scheduled to be removed. Use adequate but reasonable precautions to prevent the spread of dust, dirt and noise to adjacent areas.

1.10 PERMITS AND INSPECTIONS

A. If applicable, the Owner shall obtain and pay for the primary building permit for this project. However, the Contractor shall obtain and pay for all secondary trade permits and inspection fees required for all local, state or federal applicable codes.

B. The Contractor shall supply the Owner with a copy of all permits and inspection reports.

1.11 CUTTING AND PATCHING

A. Saw-Cut to fit, patch to match all existing surfaces which are cut for installation of new materials and equipment or the demolition of existing materials. No cutting or patching of utilities or other structures shall be done without the specific permission of the Owner.

1.12 PROJECT COORDINATION AND MEETINGS

A. Coordination: Coordinate activities included in various Sections to assure efficient and orderly installation of each component. Coordinate operations included under different Sections that are dependent on each other for proper installation and operation.

B. Meetings:

1. A pre-bid meeting will be held at the Catoctin High School as described in the invitation for bids.

2. A pre-construction meeting will be held after the project is awarded and before construction begins.

3. Progress meetings will be held as deemed necessary by the Owner but not less than one meeting every two weeks.

1.13 SUBMITTALS

A. General: Coordinate submittal preparation with performance of construction activities, and with purchasing or fabrication, delivery, other submittals and related activities and as noted in other sections of these specifications. Transmit in advance of performance of related activities to avoid delay. No extension of time will be authorized because of failure to transmit submittals sufficiently in advance of the Work to permit processing.

1. All submittals shall include, but not be limited to, name and address or contractor, name and address of subcontractor, name and address of supplier and name of manufacturer. If applicable all submittals shall show compliance with recognized trade association standards and recognized testing agency standards with appropriate labels and seals.

B. Shop Drawings: The Contractor shall submit for approval three (3) copies of shop drawings or submittals for all phases of construction and materials to be used.

C. Product Data: Collect Product Data into a single submittal for each element or system. Mark each copy to show applicable choices and options. Where Product Data includes information on several products, some of which are not required, mark copies to indicate the applicable information.

D. Samples: Submit two (2) samples of each system component.

1.14 QUALITY CONTROL

A. Responsibilities: The Contractor is to provide inspections and tests specified or required by governing authorities, and as indicated in other sections of these specifications. Costs are included in the Contract.

B. Retesting: The Contractor is responsible for retesting where results prove unsatisfactory and do not indicate compliance with Contract Documents.

C. Coordination: The Contractor is responsible for scheduling inspections, tests, and similar activities.

D. Submittals: The Contractor shall submit a certified written report of each inspection and test in duplicate.

1.15 CONTRACTOR USE OF PREMISES

A. Limit use of the premises to construction activities in areas indicated; allow for Owner occupancy and use by the public.

B. Confine operations to areas within contract limits indicated. Portions of the site beyond areas in which construction operations are indicated are not to be disturbed.

C. Keep driveways and entrances clear at all times. Do not use these areas for parking or storage of materials. After completion date of August ??, 2018 no materials will be stored at the site.

D. Use of the Existing Building: Maintain the existing building in an operational condition throughout construction. Repair damage caused by construction operations. Take precautions necessary to protect the building and occupants during the construction period.

E. Full Owner Occupancy: The Owner will occupy the site and existing building during construction. Cooperate with the Owner to minimize conflicts and facilitate Owner usage. Perform the work so as not to interfere with the Owner's operations.

1.16 RECORD AND OPERATIONS & MAINTENANCE DATA

A. If not indicated in other parts of these specifications provide the following as indicated. Record Document Submittals, Record Drawings, Record Specifications, Maintenance Manuals, Operating and Maintenance Instructions and As-Built Drawings.

1. Record Document Submittals: Do not use Record Documents for construction purposes; protect from loss in a secure location; provide access to Record Documents for the Owner's reference.

2. Record Drawings: ("As-Builts") Maintain a clean, undamaged set of blue or black line white-prints of Contract Drawings and Shop Drawings. Mark-up these drawings to show the actual installation. Mark whichever drawing is most capable of showing conditions accurately. Give particular attention to concealed elements that would be difficult to measure and record at a later date.

a. Organize record drawing sheets into manageable sets, bind with durable paper cover sheets, and print suitable titles, dates and other identification on the cover.

3. Additional Record Drawings:
At the completion of the project, the Contractor shall obtain an AutoCAD drawing file (i.e. floor plan, site plan) from the Engineer and update the file from the "as-built" drawings. The updated AutoCAD file shall be returned to the Engineer for his review, then released to the Owner at the completion of the project.

4. Record Specifications: Maintain one copy of the Project Manual, including addenda. Mark to show variations in actual Work performed in comparison with the Specifications and modifications. Give particular attention to substitutions, selection of options and similar information on elements that are concealed or cannot be readily discerned later by direct observation. Note related record drawing information and Product Data.

5. Maintenance Manuals: Organize maintenance data into three (3) sets of manageable size. Bind in individual heavy-duty 2-inch, 3-ring vinyl-covered binders, with pocket folders for folded sheet information. Mark identification on front and spine of each binder. This shall include but is not limited to the following information:

   Emergency instructions.
   Spare parts list.
   Copies of warranties.
   Wiring diagrams.
   Inspection procedures.
   Shop Drawings and Product Data.

6. Operating and Maintenance Instructions: Arrange for the Manufacturer's Representative and Installer of equipment that requires regular maintenance to meet with the Owner's personnel to provide instruction in proper operation and maintenance. This shall include but is not limited to a detailed review of the following:

   Maintenance manuals.
   Spare parts and materials.
   Control sequences.
   Hazards.
   Warranties and bonds.
   Maintenance agreements and similar continuing commitments.

B. As part of instruction for operating equipment, demonstrate the following procedures:

   Start-up and shutdown.
   Emergency operations.
   Safety procedures.

1.17 WARRANTY

A. In submitting a proposal, each bidder thereby represents that he will, upon award of the contract, guarantee in writing all materials and workmanship for a period of Two (2) years from date of substantial completion. During the guarantee period the Contractor will be required, within a reasonable length of time after receipt of written notice by the Owner, to make good any defects in materials or workmanship which may have developed and to make good any damage to other work caused by such defects or the repairing of the same, at his own expense and without cost to the Owner.

b. If a bidder cannot guarantee any material, construction and equipment that is shown or specified, or if he cannot furnish any surety bond that may be required, then it shall be so stated in his proposal, and unless this is done, it shall be understood that the bidder accepts all of the guarantee conditions called for, and he shall be bound thereto upon award of the contract. If the Owner should consent to waive any requirements in this respect, then it shall have effect only if such waiver is expressly set forth in the signed contract agreement.

PART 2 – PRODUCTS

2.1 MATERIALS AND EQUIPMENT

A. "Products" are items purchased for incorporation in the Work, whether purchased for the Project or taken from previously purchased stock.

B. "Materials" are products that are shaped, cut, worked, mixed, finished, refined or otherwise fabricated, processed, or installed to form a part of the Work.

C. "Equipment" is a product with operational parts, whether motorized or manually operated, that requires service connections such as wiring or piping.

D. Product Delivery, Storage, and Handling: Deliver, store and handle products in accordance with manufacturer's recommendations, using methods that will prevent damage, deterioration and loss.

E. Materials Storage and On-Site-Work: The Contractor shall maintain the site in a clean, neat and orderly manner at all times. Materials may be stored at the school in a designated site agreed to by both the Contractor and the Owner's project manager.

F. Installation of Products: Comply with manufacturer's instructions and recommendations for installation of products. Anchor each product securely in place, accurately located and aligned with other Work. Clean exposed surfaces and protect to ensure freedom from damage and deterioration at time of Substantial Completion.

G. Removal of Existing Products, Materials or Equipment: The Contractor shall "Remove" all existing products, materials or equipment as designated in the summary of work and as indicated in other sections of these specifications. The contractor shall be responsible for the disposal of these items at no cost to the owner.

PART 3 – EXECUTION

3.1 PROJECT CLOSEOUT

A. Substantial Completion: Before requesting inspection for certification of Substantial Completion, complete the following:

1. Submit specific warranties, workmanship bonds, maintenance agreements, final certifications and similar documents.

2. Submit record drawings, maintenance manuals, final project photographs, damage or settlement survey, property survey, and similar record information.

3. Change-over permanent locks and transmit keys to the Owner.

4. Complete start-up testing of systems, and instruction of the Owner's personnel. Remove temporary facilities from the site, along with construction tools, mock-ups, and similar elements.

5. Complete final clean up. Touch-up and repair and restore marred exposed finishes.

6. Upon completion of the Work, submit record Specifications to the Engineer for the Owner's records.

B. Site Restoration:

1. The Contractor shall be responsible for repairs to the grounds, building and/or blacktop due to traffic and/or the storage of materials. Repairs shall be made to the satisfaction of the Owner's representative and shall equal the original conditions.

C. Final Cleaning: Employ experienced workers for final cleaning. Clean each surface to the condition expected in a commercial building cleaning and maintenance program. Complete the following before requesting inspection for certification of Substantial Completion:

1. Remove labels that are not permanent labels.

2. Clean transparent materials.

3. Clean exposed hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces.

4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps. Clean the site of rubbish, litter and other foreign substances. Sweep paved areas; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

D. Removal of Protection: Remove temporary protection and facilities.

E. Compliance: Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Remove waste materials from the site and dispose of in a lawful manner.

(END OF SECTION)

SECTION 01 21 00

ALLOWANCES

A. GENERAL:

1. Each Bidder shall carry separately in the Base Bid sum (except where noted below) a cash allowance as follows, for unforeseen conditions and items of work to be selected by the Owner during the course of construction. The allowance is for the purchase of materials, equipment, labor and installation, overhead and profit, and other handling costs. If additional work associated with an allowance is requested by the Owner (above the stated quantity), the Contractor can be entitled to extra compensation based on the quantity of additional work multiplied by a negotiated unit price for that work item. If at the end of the project a balance remains on any allowance amount, the remaining portion will be credited back to the Owner based on the quantity remaining multiplied by the negotiated unit price for that work item.

B. ALLOWANCES:

1. Contractor shall include the following items or amounts in the **Base Bid** as described below:

Allowance A - The following work items will be included in the Base Bid as an Allowance:
Include amount of…… …. …….. $??.00

2. The contractor shall coordinate Subcontractors as required for work items noted above in order to ensure that all work is completed in a timely and efficient manner.

– END OF SECTION 01 21 00 –

SECTION 01 23 00

ALTERNATES

PART 1 - GENERAL

1.1 DESCRIPTION OF REQUIREMENTS

A. Definitions and Explanations: "Alternates" are defined as alternate products, materials, equipment systems, methods, units of work for major elements of construction, which may, at Owner's option be selected for work in lieu of corresponding requirements of Contract Documents.

1. Alternates may or may not change scope and general character of work substantially.

B. Accepted Alternates: Refer to Owner-Contractor Agreement and subsequent modifications thereof (if any) for determination of which alternates listed have been accepted, and are, therefore, in full force and effect as though originally included in Contract Documents for base bid.

C. Notification: Immediately following award of contract, prepare and distribute to each entity or person to be involved in performance of work, notification of status of each alternate scheduled and including those subsequently added by notification during bidding. Indicate which alternates have been: 1) accepted, 2) rejected, and deferred for consideration at later date as indicated. Include full description of negotiated modifications to alternates, if any.

D. Requirements of the General Conditions, Supplementary Conditions and Division I of these specifications apply to this section.

E. The work under these Alternates shall be performed in accordance with the applicable Sections of these specifications.

1.2 GENERAL ALTERNATE REQUIREMENTS

A. General: Description for each alternate is recognized to be incomplete and abbreviated but implies that each change must be complete for scope of work affected. Refer to applicable sections (Divisions 2 through 16) and to applicable Drawings for specific requirements of each alternate. Coordinate related requirements among sections of Specifications as required. Modify surrounding work as required to integrate with work of each alternate.

1.3 ALTERNATE DESCRIPTIONS

A. Alternate No. 1A to the Base Bid – In lieu of manual hardware, provide and install access control hardware interlocked with class schedule timeclock at both sets of cross corridor doors.

B. Alternate No. 1B to the Base Bid – As an additional feature to Alt #1A, provide and install card reader access control system at both sets of cross corridor doors.

– END OF SECTION 01 23 00 –

SECTION 01 04 50

CUTTING AND PATCHING

PART 1 - GENERAL

1.1 Scope:

1. This Section establishes general requirements pertaining to cutting, fitting and patching of the Work required to:

    1. Make the several parts fit properly;

    2. Uncover work to provide for installing, inspecting, or both, of ill-timed work;

    3. Remove and replace work not conforming to requirements of the Contract Documents; and

    4. Remove and replace defective work.

    5. Remove and patch existing construction for the completion of contract work.

1.2 Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, the General Conditions and Sections in Division 1 of these Specifications.

2. In addition to other requirements specified, upon the Architect's request uncover work to provide for inspection by the Architect of covered work, and remove samples of installed materials for testing, to verify conformance with the Contract Documents.

3. Do not cut or alter work performed under separate contracts without the Architect's written permission.

1.3 Quality Assurance:

1. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

2. Avoid unnecessary or excessive cutting. Where cutting of a finished surface is required, make cuts neatly along true lines so they will be concealed by finished work and where they will be least conspicuous.

1.4 Submittals:

1. Request for Architect's consent:

    1. Prior to cutting which effects structural safety, submit a written request to the Architect for permission to proceed with cutting. Also obtain written approval from the local building officials, if required by the local building code.

    2. Should conditions of the Work, or schedule, indicate a required change of materials or methods for cutting and patching, so notify the Architect and secure his written permission and the required Change Order prior to proceeding.

Notices to the Architect:

3. Prior to cutting and patching performed pursuant to the Architect's instructions, submit cost estimate to the Architect. Secure the Architect's approval of cost estimates and type of reimbursement before proceeding with cutting and patching.

4. Submit written notice to the Architect designating the time the Work will be uncovered, to provide for the Architect's observation.

PART 2 - PRODUCTS

2.1 For replacement of items removed, use materials complying with pertinent Sections of these Specifications and closely matching the aesthetic value of the existing material.

PART 3 - EXECUTION

3.1 Payment of Costs:

1. The Owner will reimburse the Contractor for cutting and patching performed pursuant to a written Change Order, after claim for such reimbursement is approved by the Owner. The Contractor shall perform other cutting and patching needed to comply with the Contract Documents at no additional cost to the Owner.

2. Payment of costs for cutting and patching performed due to ill-timed or defective work will be at no additional cost to the Owner.

3.2 Surface Conditions:

1. Inspection:

1. Inspect existing conditions, including elements subject to movement or damage during cutting, excavating, patching and backfilling.

2. After uncovering the work, inspect conditions affecting installation of new Work.

2. Discrepancies:

1. If uncovered conditions are not as anticipated, immediately notify the Architect and secure needed directions.

2. Do not proceed until unsatisfactory conditions are corrected.

3.3 Preparation Prior to Cutting:

1. Provide required protection including, but not necessarily limited to, shoring, bracing, and support to maintain structural integrity of the Work.

3.4 Performance:

1. The Contractor shall be responsible for any cutting, fitting and patching that may be required to complete his Work except as otherwise specifically provided in the Contract Documents. The contractor shall not endanger any Work of any other Contractor except with the written consent of the Architect.

2. Perform fitting and adjusting of products to provide finished installation complying with the specified tolerances and finishes.

3.5 Cleanup:

1. Remove all debris, rubbish, and materials resulting from cutting and patching operations. Transport materials and legally dispose of off site.

END OF SECTION

SECTION 02 11 00

SELECTIVE DEMOLITION

A. GENERAL

1. DESCRIPTION:

1.1 Requirements of the General Conditions, Supplementary Conditions and Division 1 of these specifications apply to this Section.

1.2. Include all labor, materials, appliances and services necessary to complete all demolition work required by the drawings and/or described in this specification.

1.3 Demolition includes the complete removal of building materials, as indicated on the drawings, and proper disposal, off site, of all demolished materials except where noted. Where noted, some materials may be salvaged for reuse on the project and Owner is entitled to a right of first refusal for all materials identified to be demolished.

1.3.1 See Division 15000 for Mechanical portion, and Division 16000 for Electrical portion of demolition.

2. QUALITY ASSURANCE:

2.1 All work of this Section shall be carefully executed without damage to adjacent construction shown to remain for post construction occupancy.

2.2 All materials scheduled to be relocated or reinstalled shall be removed, cleaned, and stored in such manner that they are not damaged. This includes but is not limited to cabinets and counter tops, interior doors, and interior windows.

2.3 All equipment removed as part of this Contract, and selected by the Owner to be stored for future use by the Owner, shall be delivered to the Owner's storage area.

2.4 Maintain all legal means of egress for adjacent and affected occupied areas during all demolition activities.

3. CONDITION OF STRUCTURES:

3.1 The Owner assumes no responsibility for the actual condition of structures to be demolished.

3.2 Conditions existing at the time of inspection for bidding purposes will be maintained by the Owner insofar as practicable. However, variations within the structure may occur due to work completed by the construction of earlier phases of this Project, and/or by Owner's removal and salvage operations prior to the start of the demolition work.

3.3 The Owner will be removing furnishings as required to make the work area accessible for operations.

B. EXECUTION

4. GENERAL:

4.1 Perform demolition in a systematic manner, in accordance with approved submittals.

4.2 Where required to install new finishes. Remove existing materials in a manner to accommodate new finishes including removal of all coatings, grouts, adhesives, and other bonding agents.

4.3 Where existing finishes are to remain and abut adjacent new construction, cut and remove existing materials in a neat fashion with straight edges without chipping or cracking.

5. TRAFFIC:

5.1 Conduct demolition operations and the removal of debris to ensure minimum interference with roads, streets, walks, and other adjacent occupied or used facilities. Do not close or obstruct streets, walks or other occupied or used facilities without permission from the Owner. Provide alternate routes around closed or obstructed traffic ways if required by governing regulations.

6. PROTECTION:

6.1 Provide fenced passageways, as required, to ensure the safe passage of persons around the area of demolition. Conduct operations to prevent damage by falling debris or other cause to adjacent buildings, structures, landscaping and other facilities as well as persons.

6.2 Provide dust-tight barriers as required to separate construction/demolition areas from building areas occupied by the Owner during the construction period.

6.3 Cover and protect furnishings that will remain in place during the course of construction.

6.4 Cover and protect floor finishes that will remain in place during the course of construction.

6.5 Provide a weather tight and secure barrier immediately upon removal of items from exterior walls such as louvers, doors, and windows.

7. DAMAGES:

7.1 Promptly repair damages caused to adjacent facilities by demolition operations, as directed by the Architect and at no cost to the Owner.

8. UTILITY SERVICES:

8.1 Maintain existing utilities, indicated to remain, keep in service, and protect against damage during demolition operations.

8.2 Do not interrupt existing utilities serving occupied or used facilities, except when authorized by the Architect. Provide temporary services during interruptions to existing utilities, as acceptable to the Architect.

9. POLLUTION CONTROLS:

9.1 Use water sprinkling, temporary enclosures, and other suitable methods as necessary to limit the amount of dust and dirt rising and scattering in the air, to the lowest level of air pollution practical for the condition of work. Comply with the governing regulations.

9.2 Clean adjacent structures and improvements of all dust, dirt and debris caused by demolition operations, as directed by the Architect. Return areas to condition existing prior to the start of the work.

10. REMOVAL:

10.1 General: Remove from the site all debris, rubbish and other materials resulting from demolition operations. Storage or sale of materials will not be permitted on the site.

10.2 Burning: Burning of removed materials from demolished structures will not be permitted on the site.

10.3 Removal: Transport all materials, not scheduled to be delivered to the Owner, removed from demolished structures and disposed of off the site.

10.4 Recycling: Ceiling Tile shall be recycled by the original manufacturer (Armstrong) to the greatest extent possible.

- End of Section -

SECTION 05 40 00

COLD FORMED METAL FRAMING

PART 1 - GENERAL

1.1 SECTION INCLUDES

A. Non-structural wall and floor framing on interior of building

B. Metal furring strips

1.2 RELATED SECTIONS

A. Section 09260 – Gypsum Board Systems

1.3 QUALITY ASSURANCE:

A. All work shall be in compliance with the Standard Specifications for Structural Steel for Building, and the Code of Standard Practice, adopted by the American Institute of Steel Construction. All metal stud work engaging architectural finishes shall be straight, plumb and true, and shall in no way interfere with the installation of such finishes.

1.4 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

B. Submit product information and plans showing member sizes, spacing, bridging, connection details, etc. Shop drawings and calculations, stamped and signed by a registered engineer licensed in the State of Maryland, must be submitted for all structural metal framing systems. The sizes indicated on the drawings should be used as a guide for engineering these systems and any changes in size should be coordinated with related trades.

1.5 WEATHER CONDITIONS

A. Comply with manufacturer's recommendations.

PART 2 - PRODUCTS

2.1 MATERIALS:

A. Metal Framing:

1. Cold Formed (light gauge) Metal Framing (in non-structural locations): Materials shall conform to ASTM A1003, dimensions as indicated on the supplier's approved shop drawings, galvanized per ASTM A1003 with a minimum G40 coating. Wall framing is to be a minimum 20 gage at a maximum spacing of 16" on center. Provide bridging, accessories and fasteners as required by job conditions and the supplier's engineered shop drawings. Gage and strength to be determined by supplier as required for conformance with structural and building code requirements.

2. See structural notes and drawings for additional product requirements.

B. Metal Furring:

1. Roll formed, hat-shaped sections of minimum 20 gauge galvanized steel, size 0.875” x 2.75”

PART 3 - EXECUTION

3.1 INSTALLATION:

A. Install metal framing as indicated on the drawings and in compliance with manufacturer’s instructions, securely attaching track to structure as indicated on the drawings, and studs to track at 16” on center, unless otherwise noted. Provide deflection track as required.

B. Finished surfaces shall be smooth, uniform and ready to receive architectural finishes and decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

3.2 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

- END OF SECTION 05 40 00 -

SECTION 07 90 00

JOINT SEALERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Preparing substrate surfaces.

B. The required applications of sealants include, but are not limited to, the following general locations in new work, or in areas disturbed by the work of this project:

1. Interior:

a. Control and Expansion joints.
b. Metal Door and window frames.
c. Joints at all surfaces to receive opaque finish.
d. Joints between steel columns and masonry walls.
e. Joints between all dissimilar materials unless otherwise noted.
f. Other as indicated.

1.2 RELATED SECTIONS

A. Section 08800: Sealants required in conjunction with glazing methods.

1.3 REFERENCES

A. ASTM C790 - Use of Latex Sealing Compounds.

B. ASTM C804 - Use of Solvent-Release Type Sealants.

C. ASTM C834 - Latex Sealing Compounds.

D. ASTM C920 - Elastomeric Joint Sealants.

E. ASTM D1565 - Flexible Cellular Materials - Vinyl Chloride Polymers and Copolymers.

F. SWRI (Sealant, Waterproofing and Restoration Institute) - Sealant and Caulking Guide Specification.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, substrate preparation, limitations and color availability.

C. Samples: Submit two samples illustrating sealant colors for selection.

D. Manufacturer's Installation Instructions: Indicate special procedures, surface preparation and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Specified work shall be installed by skilled tradesmen, experienced in the application of the types of materials.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Applicator: Company specializing in performing the work of this section with minimum five years documented experience.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation. Apply compound prior to final coat of paint.

1.8 PRODUCT DELIVERY, HANDLING AND STORAGE

A. Deliver all materials to job site in factory sealed and labeled containers; label shall show: Manufacturer, Type, Date of Manufacture, Shelf Life, Curing Time at 70 degrees F, Color and Manufacturer’s Instructions.

1.9 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.10 WARRANTY

A. Provide five year warranty under provisions of Division 1.

B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal, water tight seal and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.0 MANUFACTURERS:

A. Sika Corporation

B. Pecora Corporation

C. Sonneborn – Chemrex

D. Tremco, Inc.

2.1 SEALANTS

A. Back-up Materials: Flexible closed cell, expanded polystyrene or polyethylene round rodding, with diameter 1.333 times width of joint

B. Interior Sealant: Acrylic Emulsion Latex Type C: ASTM C834, single component; color as selected by the Architect

C. Interior Walls/Floors (Ceramic Tile): Pecora Urexpan NR-201, one part, self-leveling, moisture curing polyurethane sealant, designed for horizontal joints, Fed. Spec. TT-5-00230C, Type I, ASTM C920, color as selected by the Architect

D. Primers, Cleaners and Bond Breaker Tape: Provide as recommended by sealant manufacturer's installation instructions for the conditions and locations indicated on the drawings.

E. All sealants and sealant primers must meet or exceed Bay Area Air Quality Management District Reg. 8, Rule 51.

2.2 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: ASTM D1056; round, closed cell polyethylene foam rod; oversized 30 percent larger than joint width; manufactured by Dow Chemical, Sonneborn or approved equivalent.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate surfaces and joint openings are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

D. Protect elements surrounding the work of this section from damage or disfiguration.

3.3 INSTALLATION

A. Perform installation in accordance with ASTM C804 for solvent release and ASTM C790 for latex base sealants.

B. Measure joint dimensions and size materials to achieve required 2:1 width/depth ratios.

C. Install joint backing to achieve a neck dimension no greater than 1/3 of the joint width.

D. Install bond breaker where joint backing is not used.

E. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

F. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

G. Tool joints concave.

3.4 CLEANING

A. Clean adjacent soiled surfaces.

3.5 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Division 1.

B. Protect sealants until cured.

- END OF SECTION 07 90 00 -

SECTION 08 12 00

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

A. Section includes aluminum doors and frames associated with new aluminum entrances and storefronts.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

C. Related Sections:

1. Section 07900 - Joint Sealants: Caulking between aluminum and adjoining building construction.

2. Section 08710 - Finish Hardware: Finish hardware including cylinders.

1.2 SCOPE

A. Thermal Movement: Fabricate exterior components from manufacturer's stock systems, which have been designed to provide for expansion and contraction resulting from ambient temperature range of 120 degrees F.

B. Wind Loading: Fabricate exterior components from manufacturer's stock systems which have been tested in accordance with ASTM E-330 to withstand at least the following loadings:

1. Uniform pressure of 20 pounds per square foot inward and 20 pounds per square foot outward.

C. Deviations: Plans, elevations and details show spacing of members as well as profile and similar dimensional requirements of aluminum entrances and storefront work. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in Architect's sole judgment; such deviations do not materially detract from design concept or intended performances.

1.3 STANDARDS

A. Reference: Comply with applicable provisions of AAMA, Metal Curtain Wall, Window, Storefront and Entrance Guide Specifications Manual.

1.4 ENVIRONMENTAL ATTRIBUTES

A. Manufacture and Content:

1. Recycled Content: Provide aluminum products containing 20 percent minimum postconsumer recycled content aluminum material.

1.5 SITE CONDITIONS

A. Field Measurements: Take field measurements; check elevations and connecting work affecting Work of this Section.

B. The finish hardware supplier shall be responsible for furnishing physical hardware to the entrance manufacturer prior to fabrication. The finish hardware supplier shall also be responsible for coordinating hardware delivery requirements with the hardware manufacturer, the general contractor and the entrance manufacturer to insure the building project is not delayed.

1.6 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

1. Include elevations, detail sections of typical composite members, anchorages, reinforcement and expansion provisions.

B. Samples: Submit samples of each type and color of aluminum finish on 12 inch long sections of extrusions or formed shapes and on 6 inch square sheets.

C. Product Data: Submit manufacturer's specifications, standard details and installation recommendations for components of aluminum entrances and storefronts required for project, including data that products have been tested and comply with performance requirements.

D. Accurately document (with supporting information) the use of recycled materials, as required by Section 01350 - Special Procedures (LEED Certification), and post to the Schedule of Materials Costs.

1.7 WARRANTIES, GUARANTEES, TESTING

A. Provide written warranty signed by manufacturer, installer and contractor agreeing to replace aluminum entrances and storefront, which fail in materials or workmanship within two years of acceptance. Failure of materials or workmanship includes excessive leakage or air infiltration, excessive deflections, faulty operation of entrances, deterioration of finish or construction in excess of normal weathering and defects in hardware, weather-stripping and other components of the work.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS

A. Subject to compliance with requirements, provide products of one of the following:

1. Kawneer Company, Inc.

2. Vistawall Architectural Products

3. YKK AP America, Inc.

4. Substitutions: Section 01600 - Product Requirements.

2.2 MATERIALS

A. Aluminum Extrusions: Conform to ASTM B-221, Type 6063-T5 or alloy consistent with desired finish, not less than 0.125 inch thickness for all principal members; other interior members – 0.050 inch thickness; exterior trim members and snap-on covers - 0.050 inch thickness, minimum.

B. Fasteners: Stainless steel or heat-treated aluminum for unexposed fastening of aluminum-to aluminum and aluminum-to-steel; otherwise, exposed fasteners shall be aluminum-finished in the finish matching the aluminum extrusions.

C. Bituminous Coatings: Cold-applied asphalt mastic complying with SSPC-PS 12 compounded for 30-mil thickness per coat.

2.3 STILE AND RAIL-TYPE DOORS

A. Style: Kawneer Wide Stile Model 500 - modified.

B. Construction: Form from extruded sections, assembled with tension rods, top and bottom, or mechanical bolted joints top and bottom and electric arc sigma-welded without creating blemishes on exposed surfaces.

C. Glazing: Doors shall have extruded aluminum snap-in-glass stops with neoprene insets for puttyless glazing.

2.4 FRAMING SYSTEMS

A. Interior Framing (Nonthermal Break):

1. Framing systems shall be Trifab VG 450 as manufactured by Kawneer or equal as approved by the Architect.

2. The framing system shall provide for flush glazing on all sides with no projecting stops. Vertical and horizontal framing members shall have a nominal face dimension of 1-3/4 inches. Overall depth shall be 4-1/2 inches. Entrance framing members shall be compatible with glass framing in appearance. All single acting entrance frames shall include the positive barrier weathering.

B. Construction:

1. Tubular sections shall be extruded aluminum not less than 1/8-inch thickness, type as indicated on the drawings, designed for 1 inch insulating glass.

2. Door stops shall be applied to tubular sections with concealed fastenings and shall be fitted with neoprene or wool pile insert for weatherproofing and silencing.

3. Door frames shall have butts fully mortised with steel tapping backing plates. No slotting of frames will be permitted.

4. Glass Stops: Sash members shall have permanent clips to hold glass in place before face member is installed.

2.5 ALUMINUM CLOSURES

A. Where closures (break metal) are indicated and required, provide angles and covers formed of 0.125-inch minimum thickness aluminum with matching finish herein specified.

2.6 FINISH

A. All exposed surfaces shall be free of die marks, grinding marks, spots, streaks or other blemishes and shall have the following finishes.

1. Provide Anodized finish system - Clear.

PART 3 EXECUTION

3.1 INSPECTION

A. Condition of Surfaces: Installer shall inspect the substrates to which the work of this section adjoins. No work shall be installed until corrections to substrates have been performed by the trades involved.

3.2 INSTALLATION

A. Framing Members: Install in accordance with manufacturer's approved shop drawing in prepared opening. Members shall be level, square, plumb and at proper elevations and in alignment with other work.

B. Cutting and Fitting: All materials shall be accurately cut and fitted and rigidly secured in place. All cut and machined ends and recesses shall be true, accurate and free of burrs or rough edges.

C. Fastenings: For block walls, use only with toggles with finished heads; fastenings in concrete walls may be made with bolts let into expansion sleeves. Provide 1 inch diameter access hole in aluminum tube for installation of anchoring bolts. Access hole shall be located under doorstop.

D. Use care in subsequent operations to prevent distortion or damage and replace any damaged work with new material.

E. Caulking: Provide clearance between storefront metal and opening substrate for caulking with adjoining building construction. All joints in storefront metal shall be sealed during fabrication.

F. Hardware: Properly install and adjust. Final adjustment shall be made for proper and easy operation of the doors after glazing.

3.3 CLEANING AND PROTECTION

A. Cleaning: After installation, framing members shall be cleaned following procedure recommended by the manufacturer.

B. Dissimilar Materials: In addition to the finish specified, aluminum surfaces that will contact masonry, concrete, wood or steel shall be protected from contact by a coat of bituminous paint to prevent galvanic or corrosive action.

C. Masking: Apply waterproof masking tape to aluminum surfaces remaining exposed on the interior of the building, which may be splattered with mortar, plaster, paint or other disfiguring materials.

D. Protection shall be as recommended by the manufacturer and approved by the Architect. The contractor shall protect storefront from damage during subsequent construction activities. Damaged materials shall be replaced at no additional cost to the Owner.

3.4 OWNER'S INSTRUCTIONS

A. Instructions: Owner's representative shall be given written and verbal instructions as to the procedures required for keeping the work herein specified, maintained, cleaned with appropriate products and adjusted.

B. Tools: Adjusting wrenches and small tools furnished with operating hardware shall be turned over to Owner's representative, properly tagged.

C. Control: The foregoing shall not relieve the contractor of any responsibilities under the guarantee specified hereinbefore.

- END OF SECTION 08 12 00 -

SECTION 08 71 00 - FINISH HARDWARE
(Updated by FCPS Jan. 3, 2013)

PART 1 GENERAL

1.1 DESCRIPTION:

A. Provide all work necessary to complete all finish hardware work as shown on the drawings or inferable therefrom and/or specified herein, In accordance with the requirements of the Contract Documents.

1.2 RELATED SECTIONS:

A. 06200: Finish Carpentry
B. 08110: Steel Doors and Frames
C. 08210: Wood Doors
D. 08410: Aluminum Storefront Systems (this section shall require hardware by section 08710 specified herein).
E. 16700: Electrical Work
F. Overhead Roil-up Doors (7-pin i.e. cylinder)
G. Kitchen Equipment (7-pin i.e. cylinder)
H. Sound Module (9K cylindrical lock)
I. Folding Doors and Partitions (7-pin I.e. cylinder)
J. Security Gate (7-pln cylinder)
K. Walk-in Freezer or Refrigerator (Best 7-pin padlock)
L. Elevators/ADA Chair Lift (7-pln i.e. cylinder)

1.3 DETAILS OF WORK:

A. Refer to drawings, details and schedules for Items requiring finish hardware. It is the intent of this section to include all finish hardware required for the project, except for items, which are specifically noted as being specified in other sections of the specifications.

B. Coordinate the application of hardware items with door and frame details and with methods of fastening as hereinafter specified.

C. Furnish complete templates, schedules and fastening details to door and frame manufacturers and other trades requiring same, to insure doors and frames are properly cut, reinforced and prepared to receive hardware.

D. Single source, furnish only the products of one manufacturer where several manufacturers are specified for one type of hardware.

E. Work includes, but not limited to the following Items:

Hinges
Lock and latch sets

Deadlocks
Exit devices and removable mullions
Door closers
Electro-magnetic door release
Electro-magnetic locks
Power supply Key
switch
Overhead stops and holders
Push and pull plates
Kickandarmorplates
Flushbolts
Floor and/or wall stops
Thresholds
Astragals
Weather-stripping
Gasketing
Door silencers
Key cabinet

F. Work specified to be provided under other sections, includes rough carpentry and Items of finish hardware so specified or provided as part of other sections, Includingthefollowing;

Hardware For:

Windows
Toilet partitions
Operable partitions
Lockers
Cabinets or casework
Roof scuttles
Fence or gates

1.4 REQUIREMENTS OF REGULATORY AGENCIES:

A. Furnish finish hardware in accordance with the requirements, under the published procedures of the following recognized agencies. Wherever possible all hardware and its application are intended to comply with the latest edition of CASO/ANSI A117.1, NFPA 80, NFPA 101 and NFPA 105. It is the intent of this specification that all hardware and Its application shall comply or exceed the standards for labeled openings. In case of conflict between type of hardware specified and type required for fire protection, furnish type required by NFPA and UL.

1.5 QUALITY ASSURANCE:

A. All work performed and all materials furnished shall be in conformity with the

contract requirements.

B. All products listed herein are intended to describe quality, type and function of items listed. Accuracy, and strict compliance with the samples and descriptive literature upon which acceptance is based, shall be the sole responsibility of this supplier.

C. If the Architect finds materials or the finished product in which the materials are used are not in complete conformity with the contract requirements and has resulted in an inferior or unsatisfactory product, the materials shall be removed and replaced by and at the expense of the supplier.

D. The supplier shall be responsible for the provisions, proper coordination and function of the finish hardware required for all openings.

1.6 SUPPLIER QUALIFICATIONS:

A. The hardware supplier shall, in the opinion of the Architect, have sufficient experience and shall have an Architectural Hardware Consultant (AHC) as certified by the Door and Hardware Institute, as a full-time employee of Its organization. The Architectural Hardware Consultant shall be available to attend job meetings as required.

B. After delivery of hardware and prior to its Installation, the hardware consultant shall meet with the Architect and Contractor to compare final samples with actual hardware delivered. To assure acceptability, they shall review catalogs, brochures, templates, Installation Instructions, final hardware schedule, and shall rehearse Installation, procedures and workmanship, with special emphasis on unusual conditions to ensure correct technique of installation, and coordination with other work.

C. The hardware supplier shall maintain a warehouse and office within a fifty (50) mile radius of the job and maintain an inventory and field service staff in order to service the project properly.

1.7 SUBMITTALS:

A. Submit, for review, six (6) complete copies of the finish hardware schedule covering complete Identification of all Items required for the project. Include manufacturer's names and Identification of finishes. Include six (6) complete copies of catalog cuts and/or technical data sheets, identifying each item of hardware and any other data as may be required to show compliance with these specifications. The data on the shop drawings will be complete with respect to quantities, dimensions, specified performance and design criteria, materials and similar data to enable the Architect to review the information as required. These schedules shall be prepared in conformity with the best practice and standards of the Door and Hardware Institute.

B. Include a separate keying schedule, which shall Include Architect's door numbers, hardware headings, room description numbers and Owner's revised room description numbers as part of the final submittal of the hardware schedule. Schedule format to include an additional column to allow for Owner's revised room description numbers. Upon final approval of the keying requirements by the Architect and Owner, the Owners room numbers shall be listed in the appropriate column and resubmitted to Frederick County Public Schools for final review and approval.

C. The Architect's review of schedules shall neither be construed as a complete check nor shall it relieve the Contractor of responsibility for errors, deviations or omissions from the specified requirements to provide complete hardware for the project.

D. After approval of the hardware schedule the hardware supplier shall furnish to FCPS, four (4) complete sets of manufacturers warranties and product data.

All information will be submitted bound in a hardware schedule cover and shall contain the following information in the order as listed:

- Hardware schedule cover sheet
- Index of manufacturer's
- Manufacturers catalog cuts in the order as listed in the index
- Catalog cuts to be color coded and identified
- Warranties to be listed in order of Index the supplier shall also make available to the owner any service manuals for locksets.

1.8 SAMPLES:

A. In conjunction, and concurrent therewith, with the submission of the finish hardware schedule, submit to the Architect, samples of each typical Item of exposed hardware in specified finish. Submission of samples prior to installation Is mandatory. Architect's review of samples will be for design, pattern, finish and color only. All other requirements are the exclusive responsibility of the Contractor.

B. Samples Required

1. Hinges, each type.
2. Lockset with turn lever, lever cylinder.
3. Panic device, rim type with trim.
4. Pulls complete with mounting accessories.
5. Push plate with fasteners.
6. Surface mounted closer.
7. Overhead holder/stop
8. Floor and/or wall bumpers

C. After final review, deliver samples to job site for comparison with hardware delivered for installation. Unblemished samples may be used as part of the

Work.

1.9 PRODUCT HANDLING ANDSTORAGE:

A. Package and label each Item of hardware separately. Tag each item in accordance with the final hardware schedule. Each package shall contain appropriate fastenings, instructions and installation templates. Protect all items from loss or damage in shipment.

B. The General Contractor shall be responsible for receiving and providing an adequate secured storage area for all hardware. Materials shall be stored so as to assure the preservation of its quality and acceptability for the work. Locate stored material to facilitate its prompt inspection by the Architect.

PART 2 PRODUCTS

2.1 GENERAL:

A. Refer to hardware sets for application of individual hardware items as referenced to each opening or function.

2.2 HARDWARE FINISHES:

A. Produce finishes to exact match with Architect's selected samples. Variances in the color of each finish shall be minimized regardless of whether the base metal is cast, forged or stamped, or when plating is applied over steel, brass or bronze. Comparative finishes shall appear the same when viewed two feet apart and three feet away. The two samples shall be under the same lighting conditions and on the same relative plane. The finish for each item of hardware shall match the finish selected for lock and latch sets. The type of finish for each hardware item Is Indicated in the hardware sets.

2.3 HARDWARE MOUNTING HEIGHTS:

A. The following mounting heights shall apply throughout the work unless otherwise shown or specified and shall comply with the locations for hardware as recommended by the Door and Hardware Institute, other than as specified herewith.

Centerline of strike for levers	40 5/16”
Centerline of exit device touch	40”
pad Centerline of strike for	48"
dead locks Centerline of push	40"
plates Centerline of door pulls	40"

2.4 FASTENERS:

A. Provide concealed fastenings wherever possible. The use of self-tapping or sheet metal screws Is prohibited on all hardware except kickplates and push plates. All exit devices and door closers shall be through-bolt mounted.

1. Concealed Fasteners: Furnish hardware items complete with appropriate type and length of screws or other fastenings suitable to ensure proper applicatlon.

2. Exposed Fasteners: Furnish hardware with countersunk Phillips oval head type screws where concealed fastening is not possible. The finish or color of these screws shall harmonize with the product as to finish and material.

2.5 MATERIALS AND MANUFACTURERS:

A. Acceptable manufacturers for the various items specified are listed below. Products of the underlined manufacturers are ones used in this specification to denote the quality, type, design and function of hardware required. The items of hardware as specified by manufacturer's name and product nomenclature shall comply with any additional features and/or modifications such as base material, finishes, fasteners, etc. The manufacturer and supplier shall be responsible to comply with these requirements as a part of their acceptance. The special features as specified supersede the manufacturer's standard product. Only equivalent products of the listed manufacturers will be accepted. Items listed with NO SUBSTITUTE have been requested by Owner to match existing products, No alternate products will be considered for review, provide products as specified.

Hinges Continuous	Hager-Bommer-Ives
Hinges	Ives-Hager
Locksets/Latchsets	Best-No Substitute
Panic Devices	Von Duprln-No Substitute
Mullions	Von Duprin-No Substitute
Overhead Closers	LCN-No Substitute
Auto Operators	LCN-No Substitute
Overhead Holder	Glynn-Johnson-ABH
Electro-Magnetic Door Release	LCN - Rlxson

Push Plates	Ives - Rockwood - Hager
Kick and Armor Plates	Ives - Rockwood - Hager
Flush Bolts	Ives - Rockwood - Hager
Coordinators	Ives - Rockwood - Hager
Stop and Bumpers	Ives - Rockwood - Hager
Thresholds	National Guard - Pemko - Hager
Weatherstripping	National Guard - Pemko - Hager
Gasketing	National Guard - Pemko - Hager
Astragals	National Guard - Pemko - Hager
Door Silencers	Ives - Rockwood - Hager
Key Cabinet	Telkee
Access Control System	Best-No Substitute
Electric Strikes	*Von* Duprin-No Substitute

2.6 HINGES:

A. All hinges shall be of the type and size as specified and shall conform to the latest edition of ANSI/BHMA A156.1 standards and in compliance with NFPA 80 Table 2.8A. Package all hinges with machine or wood screws as required by door and frame construction.

B. Hinges shall be of flush ball bearing design with flat bottom tips and non-rising pins.

C. All non-ferrous type hinges shall be furnished with stainless steel pins as a standard and all exterior hinges shall be stainless steel with a non-removable pin (NRP) feature per hinge.

D. Where the door Jamb and/or trim projects to such an extent that the width of the hinge leaf specified will not allow the door to properly clear the frame or trim, the supplier shall furnish hinges of sufficient width to clear.

E. Types and Manufacturers:

Hager	Bommer	Ives
881279	885000	SBB1
BB1168	BB5004	SB81HW
881191	885006	5881
881199	885006	5881HW

F. Continuous hinges to be used at all aluminum storefront, cross-corridor, stairwell, cafeteria, gymnasium, locker room and exterior openings, and interior openings where doors are greater than 36" wide.

G. Types and manufacturers:

Ives	Hager
112HD	780-112HD
224HD	780-224HD

2.7 CYLINDRICAL LOCKS AND LATCHES:

A. General: Lockset and latches shall be Best 9K extra-heavy-duty cylindrical series with 7-pin interchangeable core. Locks to have solid shank with no opening for access to keyed lever keeper. Lock chassis must be through-bolted outside of the lock chassis prep to prevent rotation of chassis after installation. Lock manufacturer shall provide three-year warranty, in writing, to the Owner, along with three copies of the lock service manual.

B. Strikes shall be 16 gauge, curved brass, bronze, or stainless steel with a 1" deep box construction, and have sufficient length to clear trim and protect clothing.

C. Tubular Deadbolts shall be Best 83T with 7-pin interchangeable core.

D. Note: Mortise-type locksets will not be acceptable.

E. Types and Manufacturer's

Best-No Substitution

1) Lock series and design: 93K7 X 150 X 626
2) Tubular Deadbolts: 83Tx626
3) Cores/Cylinders: 7-pin to match existing system

2.8 PANIC DEVICES:

A. General: Furnish panic devices of the design, type, function and finish as specified

here within.

1. All devices shall be a push through type touch pad design with return stroke fluid dampener and rubber bottoming dampers. Touch pads are to be stainless steel with no exposed rivets or screws and shall exceed height of mechanism case or rail assembly (T·Shaped) to eliminate pinch points. Plastic touchpads are not acceptable.

2. Latchbolts shall be self-lubricating and have a deadlocking feature.

3. Exit devices shall be listed by UL for accident and hazard. Devices shall conform to ANSI A156.3, Grade 1 and conform to NFPA 80 and NFPA 101.

4. All panic devices shall meet the performance tests found in the Underwriters Laboratories Standard UL305 and bear the UL listing mark for panic hardware or UL 305 and UL 10C for fire exit hardware as appropriate.

5. All exit devices shall be through bolted. All trim shall be through bolted by means of concealed fasteners.

6. A factory representative to insure proper adjustment and operation shall inspect all devices after installation. The representative shall submit a written report to the Architect with copies to the General Contractor and hardware supplier upon completion of his service. This report shall include any Installation problems, noting door numbers and location along with recommendations to correct the problem.

7. All non-fire labeled exit devices shall have cylinder-dogging feature. Dogging mechanism shall be mechanical hook type with no plastic dogging cams.

8. All surface strikes shall be roller type and come complete with a locking plate underneath to prevent movement.

9. End caps shall be of heavy-duty metal alloy construction and provide horizontal adjustment to provide flush alignment with device cover plate. When end cap is installed, no raised edges will protrude.

10. Lever trim shaII be heavy-duty type with a breakaway feature to limit damage to the unit from vandalism and fastened by means of concealed welded lugs and through-bolts from Inside. Trim shall be forged brass with a minimum average thickness of .090" and have forged pulls.

11. Outside trim on exterior doors shall be Ives VR910 DT-US32D, unless near a Knox box then it shall be Ives VR910 NL-US32D.

12. Provide rim exit devices at single doors. Provide two rim exit devices with keyed

removable steel mullion at pairs of doors. Concealed or surface vertical rod exit devices or aluminum mulllons will not be permitted except LBL-Less Bottom latch concealed cable device may be used at cross-corridor applications.

13. Provide QEL-Quiet Electric latch Retraction at electrified exit device applications.

B. Types and Manufacturers:

Panic devices

Von Duprin-No Substitution

XP99 Serles (exterior) 99 Series (interior)
9949/9949-F-LBL(cross-corridor)

C. Types and Manufacturers: Mullions

Von Duprin-No Substitution

KR4954 x
154
Stabilizer
s KR9954
x 499F x
154
Stabilizers

2.9 OVERHEAD SURFACE CLOSER

A. Surface Closers

1. Shall conform to ANSI A156.4, Grade 1, NFPA 80, NFPA 101 and Ul10C.

2. Full rack-and-pinion type closer with non-ferrous cover and cast iron body. Double heat-treated shaft, full complement bearings, single piece forged piston, chrome silicon steel spring, non-critical screw valves; back check, sweep and latch.

3. ISO 9000 certified. Units stamped with date of manufacturer code.

4. All non-sized closer to be independent lab tested for 10,000,000 cycles.

5. Locate closers on interior side of exterior doors and on

the non-public side of interior doors, unless otherwise specified. Closers are to be parallel arm mounted.

6. Closers to be non-sized, field adjustable from size 1 to 6.

7. Furnish all non-sized closers with 11/2" diameter piston.

8. All closers shall be mounted with through-bolts.

9. Provide plates, brackets, and special templates when needed for Interface with
particular header, door, and wall conditions and adjacent hardware.

10. Maximum opening force to meet ADA: Exterior doors 8.5 lb.; interior doors 5 lb.; fire doors 15 lb.

11. Spring Cush (SC} Arms at all exterior, Gym, Cafeteria, Stair, and high traffic openings.

12. Closers tested to 100 hours of ASTM 8117 salt spray test, furnish data on request.

13. Spring power adjustment aided by visible size indicator, i.e. "FAST Power Adjust".

14. Closers to have a stable fluid withstanding temperature range of 120 degrees to- 30 degrees hydraulic fluid

15. Install closers at 180-degree templating to provide maximum ADA compllance.

16. Closer products with any type of pressure relief valve system will not be acceptable.

17. Types and Manufacturers:

LCN-Substitution

4040XP pull-side application 4040XP SCNS push-side application

18. Auto operators shall be supplied as specified in hardware set at the end of this section. Furnish all labor, materials, equipment and services necessary for proper installation of the LCN Senior Swing handicap door system, a low energy power operated door system as defined In current ANSI/BHMA A159.19. All auto operators are to be Installed by a certified LCN installation company. Provide Touchless actuators. Coordinate with access control system.

19. Types and Manufacturers:

LCN-No Substitution

Senior Swing Series 9530/9540

2.10 OVERHEAD HOLDERS AND STOPS:

A. General: Furnish surface-mounted overhead holder/stop of the type, design and function as specified here within.

1. All holders shall be non-handed and furnished complete with proper fasteners.

2. All holder arms and channels shall be made of extruded bronze or stainless steel.

3. Shock absorber to be a shock absorbing coil steel spring with a rubber insert.

4. Furnish sex bolts on all wood doors.

B. All products herewith shall comply with the standards of ANSI/BHMA A.156.8.

C. Types and Manufacturers:

Glynn-Johnson

450$	4420
450F	4430
450H	4410
90H	9000H

2.11 ELECTRO-MAGNETIC DOOR RELEASE:

A. General: Furnish electromagnets hold open devices designed specifically to hold fire and smoke doors open until released under activation of the fire alarm system or loss of power.

1. Faceplates shall be stainless steel for flush or surface mounting and shall fit into standard single gang electrical boxes.

2. Assembly shall consist of an armature contact plate with adjustable pivot mounting.

3. All units to be equipped with easy wire quick insert connectors.

4. Holding force to be 25 pounds, voltage to be 24VDC, unless otherwise approved by the Architect.

5. Types and Manufacturers:

LCN	Rixon
SEM7840	FM998

NOTE: ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING, JUNCTION BOXES, CONDUIT, RECIFIERS, TRANSFORMERS ETC., INCLUDING ALL CONNECTIONS AS REQUIRED TO PROVIDE A COMPLETE OPERATIONAL SYSTEM UNDER DIVISION 16/DIVISION 28.

2.12 PUSH/PULL PLATES:

A. General: Push plates and pull plates shall be provided as scheduled.

B. All plates shall be drilled and countersunk approximately 6" on centers. All plates shall be furnished with stainless steel Phillip's head screws with undercut heads to Insure a tight bond on any type of door. All plates shall be packaged in individual envelopes, clearly marked and sized. All material shall be properly packaged to protect the finish.

C. All products shall comply with ANSI/BHMA standards A156.6 and A156.18.

D. All push and pull plates shall have radius corners.

E. All push plates shall be a minimum thickness .125.

F. All pull plates shall be a minimum thickness .050.

G. Types and Manufacturers:

Ives	Rockwood	Hager
82004"x16"	73 RC, 4x16	90R,4 X16
8302 4"x16"	107 X 70RC, 4X16	43G, 4x16

2.13 KICK AND ARMOR PLATES:

A. General: All kick plates and armor plates shall be .050 inch minimum thickness stainless steel, US32D. Plates to be beveled three edges (B3E), drilled and countersunk with stainless steel screws 5/8" minimum with matching finish.

B. All plates shall be in compliance with ANSI/BHMA standards A156.6 and A156.18.

C. Types and Manufacturers:

Ives	Rockwood	Hager
8400 Serles	K1050 Serles	193S

2.14 MANUAL FLUSH BOLTS AND COORDINATORS:

A. General: All flush bolts are to be manually operated and furnished for pairs of doors as specified. Furnish minimum length of 12" for all rods, except where any door is higher than 7'-0", furnish the top bolt in a length sufficient to locate the flush bolt operator no more than 6'-0" above the finished floor. Comply with ANSI A115.4, door and frame preparation and ANSI/BHMA A156.16. Furnish standard strikes with wrought boxes for top bolts. Furnish dustproof strikes for bottom bolts. Coordinators are to be used only on hollow metal doors.

B. Types and Manufacturers:

Ives	Rockwood	Hager
FB458	555	282D
FB41P/42	1942	291D
CORxFLxMB1/2	1600xFillerxMtg. Brkt.	297Dx297Fx297M/N
FB31P/32	1842	292D
FB358	557	283D

2.15 DUSTPROOF STRIKES:

A. Dustproof Floor Strikes: For 5/8" round or 1/2" square bolts.

1. Ives: DP1/2
2. Rockwood: 570
3. Hager: 280X

2.16 FLOOR AND WALL STOPS:

A. General: Furnish floor and/or wall stops as indicated, unless otherwise specified.

Ives	Rockwood	Hager
WS406CCV	410	236W
FS436	440	241F
FS441	471	257F
FS495	494	326W
FS496	491	326F

2.17 THRESHOLDS:

A. General: Furnish thresholds of the type, finish and material as specified.

B. Fasteners shall be of stainless steel or non-ferrous material with a finish compatible with the threshold. The length of the screw used should be the proper length to allow for a minimum of 3/4" thread engagement in the floor or anchoring device used.

C. All material shall be Incompliance with ANSI/BHMA standards A156.21.

D. All aluminum extrusions are to be of alloy 6063 hardness T-5.

E. Types and Manufacturers:

National Guard	Pemko	
513	1665A	413S
896S	2005	520S
950S	2001	477S

2.18 WEATHER STRIPPING/GASKETING:

A. General: Furnish all weather stripping, gasketing, door bottoms and astragals as specified.

B. Wherever the specified materials are used in conjunction with a fire rated opening, products shall have been tested in accordance with the Underwriters Laboratories, UL10C and shall meet the requirements of positive pressure USC 7- 2.

C. All gasketing material shall be silicone and in compliance with ANSI/BHMA standard A156.22 for door gasketing systems.

D. Types and Manufacturers:

	National Guard	Pemko	Hager
Gasketing	107S	379S	864S
Gasketing	155S	303AS	891S
Gasketing	9090	PK55	
Door Sweep	C627A	3452CP	770SB
Door Sweep	C607A	18062CP	802S
Astragal	158SA	355 CS	859S
Astragal	109SA	375CR	874S
Astragal	9115A		

2.19 DOOR SILENCERS:

A. Furnish for all hollow metal frames, three door silencers for each single door and two each for each pair of doors as manufactured by one of the following manufacturers.

1. Ives:
2. Rockwood:
3. Hager:

SR64 608
307D

2.20 KEY CONTROL SYSTEM:

A. General: Furnish a complete key system of the type specified.

B. Provide key cabinet made of cold rolled, minimum 18-gauge furniture steel electro-welded. Doors shall have continuous brass pin piano type hinge and shall be equipped with chrome-plated locking handles, hook cam and two paracentric keys. All locks shall be nickel plated with solid brass pin tumbler cylinder keyed as directed. Key cabinet and key control system shall accommodate all keys for this project plus fifty percent expansion.

1. Key tags shall consist of two sets: Permanent self-locking and loan key snap hook type with tag colors as follows: Red fiber markers of the permanent

self-locking type approximately 1·1/4" inch in diameter on, which shall be engraved the legend, "File Key Must Not Be Loaned."

2. Also furnish for each hook a white cloverleaf key marker with snap hooks on which shall be engraved "Loan Key."

C. The hardware supplier shall attach a key tag to each change key and shall mark thereon the respective architectural key symbol and key bitting number. Each group of keys shall be contained in a key gathering envelope, which shall Include the architectural key symbol, key bitting number and architectural room description number.

The hardware supplier shall be responsible for properly identifying and tagging all change keys, setting up the key cabinet and key Index system.

The General Contractor shall be responsible for verifying that all locksets are Installed In their proper location and that the key changes operate the correct locks.

1. Key Index System Shall Include:

a. Hook number
b. Architectural key symbol
c. Archltectural door number
d. Owner's revised room number
e. Key bitting number

D. The hardware supplier shall Include In their scope of work all labor necessary to completely layout the key index system and install all keys, properly Identified In the key cabinet. The permanent keys and key cabinet shall be delivered directly to the Owner.

E. The key cabinet shall be a three-way cross Index system and shall include a hardbound copy and disk, including master key listing the keys alphabetically, the hooks numerically and the key bitting changes numerically. Attach the keys to the two sets of numbered tags supplied with the cabinet, permanent tag and the loan key tags. The supplier shall Instruct the Owner in use of the system. The General Contractor shall install the cabinet in a location selected by the Owner.

F. Type and Manufacturers:

1. Telkee Aristocrat AWC-450-S System

Size of system is minimum requirement, appropriate size to be furnished dependent on project.

2.21 KEYS AND KEYING:

A. Provide Best brass construction cores and keys during the construction period. Plastic construction cores will not be permitted. Construction cores shall not be part of the Owner's permanent keying system or furnished on the same keyway or key section as the owner's permanent keying system.

B. Permanent Best cores and keys shall be prepared according to the approved keying schedule and shall be furnished to the Owner by the local Best factory representative prior to occupancy.

C. All cylinders and cores shall be Best 7-pin, interchangeable core. Furnish Best "Premium" cores at all exterior keyed openings. Best cores shall be keyed by the factory to match the existing Frederick County Public School key system.

D. Permanent Best keys and cores shall be 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 "Duplication Prohibited."

E. Grand Master keys, Master keys and other Security keys shall be transmitted to the Owner by Registered Mail, return receipt requested.

F. Furnish keys in the following quantities:
1. 4 each Grand Master keys
2. 4 each Master keys per set
3. 4 each Change keys each keyed core
4. 9 each Construction Master keys
5. 1 each Construction Control key

G. The Owner, or the Owner's agent, will install permanent cores and return the construction cores to the Contractor's Hardware Supplier. All Construction cores and keys remain the property of the Contractor's Hardware Supplier.

PART 3 EXECUTION

3.1 INSTALLATION GENERAL:

A. The Contractor shall receive all hardware for doors as shown and scheduled and as in accordance with the approved hardware schedule.

B. Provide an adequate and secured storage area for all hardware; refer to paragraph 1.09.

C. Install all hardware in strict accordance with the manufacturer's templates and Installation procedures and workmanship, refer to paragraph 1.03.

D. The Contractor shall turn over to the Owner any tools supplied with the hardware to adjust or maintain the hardware.

E. In conjunction with the hardware supplier, the Contractor shall adjust and check the installation of hardware prior to acceptance by the Owner and/or Architect.

F. The Contractor shall obtain a copy of ANSI/DHI A115.IG-1994. "Installation Guide for Doors and Hardware." It is the intent of this document to be used

as a reference guide in the proper handling, storage and installation of finish hardware and doors and frames. This document can be obtained through the Door and Hardware Institute, Chantilly, VA.

G. All hardware shall be inspected by the factory representative prior to final acceptance by FCPS to ensure proper installation and adjustment. The representative shall submit a written report to the Architect with copies to the Contractor and hardware supplier upon completion of his service. This report shall Include any installation problems, noting door numbers and location along with recommendations to correct the problem.

H. The Contractor and construction manager shall coordinate a pre-installation meeting with the hardware installers, the hardware supplier, and manufacturers' representative to review products specified and their proper Installation.

3.2 Electronic Access Control System Requirements:

A. Summary of Work: The hardware supplier shall obtain the services of Best Access Systems to furnish and install the hardwire Electronic Access Control System (EAC) under this Section. The EAC system shall be tied into Frederick County Public Schools (FCPS) existing BASIS Access Control Software System. Through the hardware supplier, BEST shall furnish all labor, material and services necessary to install a complete EAC system. Note, regardless of door and frame material, the EAC system shall be included in the hardware supplier scope of work. No deviations will be allowed. Card Readers shall be provided at the doors indicated in the attached hardware schedule.

B. Access Control System Equipment Requirements:

Furnish the following equipment:

1. One (1) Intelligent System Controller/ Network Device/ Communication Cable & Enclosure # BAS-2220 x LS-MSS100-1 x HOC-ETHLAN.
2. Minimum of five (5) Magnetic Card Access Reader BAS-2005W (Black) per school.
3. Minimum of three (3) Dual Reader Interface Module BAS-1320 per school.
4. Minimum of one (1) "UL" listed Power Supplies & Enclosure BAS·AL600ULM x ABT-12 per School.
5. Wiring requirements are 18 gauge, 4 paired, (8 wire) twisted, shield, plenum rated "UL" listed. Note: Wire shall be provided and installed by BEST. The Electrical Contractor shall provide conduct as required, under Division 16.

Note equipment shall be configured and engineered to suit overall system requirements above quantities may vary.

C. Hardware Requirements and Door Application:

At exterior (double or single) doors requiring exit devices, furnish fall secure quiet electric latch retraction exit devices (QEL), power supply, and power transfer hinge (EPT-10). At non-egress (single) exterior door furnish cylindrical lockset with fall secure electric strike (6211). All electrified hardware shall be interfaced with the EAC system, and be connected to the emergency generator. Regardless of door and frame material, electrified hardware shall be Included in the hardware supplier scope of work.

Example 1 Double doors to receive card reader will require:

2	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	MULLIION	KR4954 X 154 STABILIZERS
1	EA	PANIC HARDWARE	CD XP99EO
1	EA	PANIC HARDWARE	SD QELXP99EO
1	EA	RIM CYLINDER	1E72
3	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910 DT
1	EA	DOOR PULL	VR910 NL
2	EA	SURFACE CLOSER	4040XP SCNS
1	EA	CARD READER	BAS-2005 W
2	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS 904-4RL-BB-KLC

Example 2 Single door to receive card reader will require:

1	EA	CONTINUOUS HINGE	224HD
1	EA	POWER TRANSFER	EPT-10
1	EA	PANIC HARDWARE	SD QELXP99 EO
1	EA	RIM CYLINDER	1E72
1	EA	MORTISE CYLINDER	1E74
1	EA	DOOR PULL	VR910NL
1	EA	SURFACE CLOSER	4040XPSCNS
1	EA	DOOR SWEEP	
1	EA	THRESHOLD	
1	EA	POWER SUPPLY	PS904-4RL-BB-KLC
1	EA	CARD READER	BAS 2005W

D. Power and Network Requirements:

As necessary, the Electrical Contractor responsible for Division 16 shall provide switched 120V power, conduit and junction boxes at each card reader location and In the Server/Telecom room for EAC equipment. General Contractor shall be responsible for providing a network drop at the Server/Telecom room. FCPS shall provide a dedicated IP address to

BEST before EAC system start up. EAC system consisting of card reader system and electrified hardware controlled by card access shall be tied into the emergency generator back up system. In addition, provide battery back up at Main Entrance door. Prior to installation, coordinate final location of card readers and access control equipment with FCPS.

E. Owner Provided:

Magnetic swipe cards shall be furnished and programmed by FCPS.

F. Submittals:

In accordance with Division 1, submit shop drawings and catalog cuts for approval.

Hardware Set Schedule:

Set #1 BASE BID – Cross Corridor Doors 1/100 and 2/100 consisting of 1 pair 3’-0”x7’-0” aluminum entrance doors in storefront framing. Each to have:

BASE BID Function – Manual egress hardware with (egress only) function and keyed access. Electronic access control not included.

2	Continuous Hinges – Hagar Roton 780-224HD	Clear
2	Rim Exit Device – Von Duprin CDSI-99E0	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
3	Mortise Cylinders – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	

Set #1A ADD ALT #1A – Cross Corridor Doors 1/100 and 2/100 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to Have:

ADD ALT #1A Function – Access controlled egress hardware with (egress only) function and keyed access. Electric latch retraction interlocked with existing timeclock on class change schedule.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99EO With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder - Best	626
1	Mortise Cylinder – Best	626
2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #1B ADD ALT #1B – Cross Corridor Doors 1/100 and 2/100 consisting of 1 pair 3’-0”x7’-0” aluminum doors in storefront framing. Each to have:

ADD ALT #1B Function – Access controlled egress hardware with (egress only) function and keyed access. Electric latch retraction interlocked with existing timeclock on class change schedule AND activated by card reader.

2	Continuous Hinges – Hagar Roton 780-224HD-EPT	Clear
2	Rim Exit Device – Von Duprin QEL99EO With Electric Latch Retraction	626
1	Keyed Removable Mullion KR4954	689
1	Pull – Ives VR910 DT	US32D
1	Pull – Ives VR910 NL	US32D
1	Rim Cylinder – Best	626
1	Mortise Cylinder – Best	626

2	Surface Closers – LCN 4040XP SCNS-30-61	689
2	Mounting Plates	689
1 Pair	Floor Stops	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #2 – Door 1/1001 consisting of single 3'-0"x7'-0" aluminum entrance door in storefront framing.

Function – Access controlled egress hardware with electric strike activated by remote desk station and card reader.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Storeroom Lockset – Best 9K37-15-D	626
1	Rim Cylinder - Best	626
1	Electric Strike – Von Duprin 6400	US32D
1	Surface Closer – LCN 4040XP	689
1	Mounting Plate	689
1	Wall Stop	
1 Set	Weather Stripping	
1	Card reader BAS-2005W	
1	Remote desk station	
1	Power Supply PS 904-4RL-BBK-KLC	

Set #3 – Door 2/1001 consisting of single 3'-0"x7'-0" aluminum entrance door in storefront framing.

Function – Manual egress hardware and lockset. Electronic access control not included.

1	Continuous Hinge – Hagar Roton 780-224HD	Clear
1	Cylindrical Lockset – Best 9K37-15-AB	626
1	Surface Closer - LCN 4040XP	689
1	Mounting Plate	689
1	Wall Stop	

Set #4 – Door 4/100 consisting of single existing aluminum entrance door in existing storefront framing.

Function – Existing access controlled egress hardware activated currently by AI Phone only.

RETROFIT Hardware as required to accommodate relocated card reader.

END OF SECTION

SECTION 08 80 00

GLASS AND GLAZING

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes glass and glazing.

B. Work shall be conducted in accordance with General Conditions, Supplementary Conditions, Division 1 and the requirements of this Section.

1.2 STANDARDS

A. As required by Safety Glazing Materials regulations and agencies having jurisdiction, provide safety glass manufactured, tested, permanently labeled and installed per these requirements.

1.3 SUBMITTALS

A. Shop drawings shall be in accordance with the General Conditions, Supplementary Conditions and Division 1.

B. Copies of the shop drawings, after being certified by the contractor and approved by the Architect, shall be requested by the glazier through channels for the purpose of ordering the glass and expediting its delivery.

C. Samples: Submit, when notified for the Architect's inspection and approval, samples of the types of glass specified. Sample shall be at least 4 inches wide by 9 inches long in required thickness.

1.4 WARRANTIES, GUARANTEES, TESTING

A. Warranty: All insulating glass shall be a banded type and carry a 10-year warranty by the manufacturer that under normal conditions, material obstruction of vision resulting from film formation or dust collection between the interior glass surfaces of the double-insulating glass will not occur.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Glass: Glass shall bear the manufacturer's original label for each piece manufactured by the American-Saint Gobain, Libbey-Owens Ford Glass Company, PPG, Guardian or equal as approved by the Architect.

B. Clear glass shall be transparent flat glass that meets the requirements and tolerances of ASTM C-1036.

C. Glass products shall be tempered for use in doors, entranceways, or other high traffic density areas or in hazardous locations as defined in the U.S. Consumer Product Safety Commission Standard 16 CFR 1201 C1 and C11, or for fixed glazed panels as defined in state glazing laws or building codes.

D. Glazing Compound: Glazing compound shall be the product of Pecora, Tremco, or equal as approved by the Architect, in color matching frames as closely as possible.

2.2 SIZES

A. Glass shall conform to manufacturer's standards for maximum size for each type of glass. All tempered glass and double-insulating glass panels shall be ordered from exact sizes given on shop drawings or from field measurements. Lights that are narrower than they are high shall be cut to order to obtain the best viewing.

2.3 GLASS TYPES

A. Safety Glass (Type G-3) (interior glazing): Clear tempered, 1/4” thick, ANSI Z97.1, Federal Standard 16 CFR 1201 Category I and Category II, with label clearly visible after glazing. This type includes laminated glass as required by the standards referenced above and IBC 2012 Chapter 24 Section 6.

B. Sealant: Elastic non-hardening glazing sealant, recommended by glazing manufacturer.

C. Setting Blocks: Neoprene, hardness: 70 to 80 Shore A Durometer, generally 1/8” wider than materials to be glazed and minimum 4” long, 1/8” thick.

PART 3 EXECUTION

3.1 INSTALLATION

A. Glazing Standards: Applicable requirements of the Glazing Manual of Flat Glass Marketing Association (FGMA), 3310 Harrison, Topeka, Kansas, 66611 latest edition are hereby made a part of these specifications.

B. Glazing shall not be done when the temperatures are below 40 degrees Fahrenheit. When circumstances require the glazing below 45 degrees Fahrenheit, steps shall be taken to assure clean, dry and frost-free surfaces as approved by the Architect.

C. Spacers and Shims: All glass to be set with 3/32 inch x 1/4 inch x 3 inch spacers, positioned on 24 inch centers on fixed and removable stops made of 40-70 shore hardness rubber or neoprene setting blocks, 1/4 inch x 1 inch x 4 inches long or 1/4 inch x 5/8 inch x 4 inches long, as required by FGJA Standards for installing glass at quarter points.

D. Channel Glazing: All glass to be set with a minimum of 1/8 inch spacers on both sides of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with one part acrylic sealant at heel finished with architectural glazing compound or vision strip.

E. Face Glazing: All glass to be set with a minimum of 1/8 inch spacers on rabbet side of glass with setting blocks at quarter points. Against rabbet, apply butyl tape. Face bed with architectural glazing compound.

F. Neoprene Beads: Glass in aluminum door frames and screens held by neoprene-extruded beads, snap-in type shall be inserted into stops with slight buttering at corners with channel glazing compound. Install glass per manufacturer's instructions.

G. Lights in Borrowed Lights: Glaze with metal stops as detailed. Face glaze as specified above.

3.2 CLEANING AND REPLACEMENT

A. This contractor shall properly protect all glass installed by him from injury or breakage during construction of the building. The contractor shall assume all responsibility for breakage by whomsoever caused and shall replace all cracked, broken, scratched or otherwise defective glass when directed to do so by the Architect.

B. Wash, rinse and dry glass at frequent intervals during construction in accordance with manufacturers' recommendations.

- END OF SECTION 08800 -

SECTION 09 25 00
GYPSUM WALLBOARD

PART 1 - GENERAL

1.01 DESCRIPTION:

A. Requirements of the General Conditions and Supplementary Conditions apply to this Section.

B. Include all labor, materials, appliances and services necessary to complete all gypsum wallboard and related work required by the drawings and/or described in this specification.

C. Work of this Section includes repairs to existing gypsum board, located within the existing building, and preparing existing gypsum board to receive new finishes.

1.02 QUALITY ASSURANCE:

A. All work shall be in compliance with the Drywall Construction Handbook, published by United States Gypsum Company.

10.3 SUBMITTALS:

A. Submit manufacturer's literature for all materials and installations.

1.04 WEATHER CONDITIONS:

A. Comply with manufacturer's recommendations.

1.05 WORK BY OTHER SECTIONS:

A. Division 5 - Lightgage Metal Framing

PART 2 - PRODUCTS

2.01 MATERIALS:

A. Gypsum Wallboard:

1. Regular: 5/8" x 4' x 8' (minimum), with tapered edges, ASTM C-36, Underwriters Laboratories Approved

2. Type X (special fire resistant): 0.625" x 4' x 8' (minimum), with tapered edges, Underwriters Laboratories Approved

B. Fasteners: 1-1/2" GWB-54 annular ringed nails or 1-1/4" drywall screws, Type W with phillips head.

C. Drywall accessories include corner and casing beads; shall be standard galvanized recessed types requiring finishing with joint treatment compound.

D. Joint Treatment System: Includes perforated tape, joint compound and topping compound.

E. Expansion Joints: USG Control Joint #093

PART 3 - EXECUTION

3.01 INSTALLATION:

A. Install gypsum wallboard and accessories in locations and positions indicated on the drawings, complying with manufacturer's installation instructions.

B. Cut wallboard by scoring and breaking, cut to fit tightly to other sheets of wallboard and around penetrations and protrusions. Joints shall fall on the centers of supporting members. Install with nails at 8" centers or screws at 16" centers.

C. Finish wallboard using 3 coats of compound 24 hours apart. Finish all dimples from fasteners and joints between sheets of wallboard. Apply dampened tape with the first coat and feather compound edges to provide a smooth and uniform surface. Sand rough areas but do not excessively roughen the wallboard paper.

D. Build fire rated assemblies in accordance with specific fire resistance classifications of the Underwriters' Laboratories.

E. Provide expansion joints as indicated on the drawings. Unless otherwise noted, provide joints to align with expansion control joints in masonry walls, concrete floor, and other building structural elements. Joints shall extend from floor to metal deck/top of gypsum wallboard above, and shall be installed aligned on both sides of all interior walls.

F. Finished surfaces shall be smooth, uniform and ready to receive decoration. Protect finished surfaces, and repair damaged work to the satisfaction of the Architect.

G. Level of Finish: Level 4 in accordance with the United States Gypsum Construction Handbook.

3.02 JOINT TREATMENT

A. Tape, fill and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

3.03 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet in any direction.

3.04 CLEAN-UP:

A. At the completion of the job, remove all excess materials from the site.

END OF SECTION

SECTION 09 51 10

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Suspended metal grid ceiling system and perimeter trim as indicated on the drawings and as required to patch and repair existing materials.

B. Mineral fiber acoustical ceiling tile units.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. ASTM E1264 - Classification of Acoustical Ceiling Products.

C. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

1.4 SYSTEM DESCRIPTION

A. Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with maximum deflection of 1/360.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on metal grid system components and acoustical units.

C. Product Data: Submit data on acoustical wall treatment.

D. Samples: Submit two samples 6 x 6 inch in size illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 6 inches long, of suspension system main runner, cross runner and edge trim.

E. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.7 QUALIFICATIONS

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.8 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C) and maximum humidity of 40 percent prior to, during and after acoustical unit installation.

1.9 SEQUENCING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustical units after interior wet work is dry.

1.10 EXTRA MATERIALS

A. Furnish under provisions of Division 1.

B. Provide 2 percent of total acoustical unit area of extra panels to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong World Industries, Prelude System

B. Chicago Metallic, 200 Series

C. Equal product by CertainTeed

2.2 SUSPENSION SYSTEM MATERIALS

A. Non-fire Rated Grid: ASTM C635, intermediate duty, exposed T components die cut and interlocking.

B. Grid Materials: Commercial quality cold rolled steel with galvanized coating, minimum 25% recycled content.

C. Exposed Grid Surface Width: 15/16 inch.

D. Grid Finish: Baked Polyester Paint, color to be White.

E. Accessories: Stabilizer bars, clips, splices, edge moldings, hold down clips and as required for suspended grid system.

F. Support Channels and Hangers: Primed steel; size and type to suit application and ceiling system flatness requirement specified.

2.3 MANUFACTURERS - ACOUSTICAL UNITS

A. Armstrong World Industries (used as the standard of quality, listed model numbers)

B. Equal product by Chicago Metallic

C. Equal product by CertainTeed

2.4 ACOUSTICAL UNIT MATERIALS

A. Acoustical Ceiling Panels (Size See finish schedule for location of each type of tile):

1. ACT -1 to be 24 X 48 inches, Armstrong Fine Fissured, (to match existing ACT in lobby and corridor),

2. Thickness: 3/4 inches

3. Composition: Wet formed mineral fiber, minimum 35% recycled content, no added formaldehyde.

4. NRC Range: .70

5. CAC Range: 35

6. Fire Hazard Classification: Class A, Flame Spread less than 25

7. Edge: Square

8. Surface Color: White

9. Surface Finish: Factory applied

2.5 ACCESSORIES

A. Touch-up Paint: Type and color to match acoustical tile and grid units.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that layout of hangers will not interfere with other work. Confirm starting lines for layout with Architect.

3.2 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C-636 and manufacturer's instructions and as supplemented in this section.

B. Intermediate - duty grid: Comply with ASTM C-636, suspension requirements of ASTM C-635, intermediate-duty systems, and manufacturer's installation instructions.

C. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

D. Locate system on room axis according to reflected plan.

E. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

F. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

G. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions.

K. Form expansion joints as detailed. Maintain visual closure.

3.3 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Install units after above ceiling work is complete.

D. Install acoustical units level, in uniform plane, and free from twist, warp and dents.

E. Cut panels to fit irregular grid and perimeter edge trim.

F. Where bullnose concrete block corners occur, provide preformed closers to match edge molding.

G. Install hold-down clips to retain panels tight to grid system within 20 ft of all exterior doors.

3.4 ERECTION TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet.

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.5 STOCK MATERIALS

A. At the end of the project, provide 2% of the acoustical tile for each size, type and pattern installed. Extra stock to be turned over to the owner.

- END OF SECTION 09 51 10 -

SECTION 09 65 19

RESILIENT FLOORING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Resilient tile flooring, including vinyl composition tile. Installation requires matching existing tile in multiple locations.

B. Rubber base.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. ASTM E84 - Surface Burning Characteristics of Building Materials.

B. ASTM F1066 - Vinyl Composition Floor Tile.

C. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.4 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns and colors available.

C. Samples: Submit two sets of samples illustrating color and pattern for vinyl tile, rubber tile, rubber base and reducing/trim strips for color selection by the Architect.

D. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention.

1.5 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame/smoke rating requirements.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Division 1.

1.7 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain ambient temperature required by adhesive manufacturer three days prior to, during, and 24 hours after installation of materials.

1.8 MAINTENANCE DATA

A. Submit under provisions of applicable Division 1 sections.

B. Maintenance Data: Include maintenance procedures, recommended maintenance materials, and suggested schedule for cleaning, stripping, and re-waxing.

1.9 EXTRA MATERIALS

A. Furnish under provisions of Section 01700.

B. Provide one box of each type of tile per 50 boxes of tile per color/pattern used, 10 lineal feet of base for every 500 linear feet installed, and four external base corners.

1.10WARRANTY

A. Provide manufacturer's standard 5-year warranty on all tile flooring products.

PART 2 PRODUCTS

2.1 MATERIALS – VINYL TILE FLOORING

A. Vinyl Composition Tile: ASTM F1066 and SS-T-312 BC, Type IV

1. Size: 12 x 12 inch – to match existing
2. Thickness: 1/8 inch – to match existing
3. Design: marbleized – to match existing
4. Manufacturers:
   a. Armstrong, Style - Standard Excelon Imperial Textured
   b. Azrock, Style - Custom Cortina
   c. Tarkett, Style - Expressions
   d. Mannington - L
5. Pattern: Varies – to match existing
6. Color: Varies – to match existing

2.2 MATERIALS – RUBBER BASE

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite

2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.3 MATERIALS – SHEET VINYL

A. Base: FS SS-W-40, Type 2, Rubber; top set coved base; premolded external corners:

1. Height: 4 inch – to match existing
2. Thickness: 1/8 inch
3. Length: Roll
4. Color: Varies – to match existing
5. Base Accessories: Premolded end stops and external corners, of same material, size and color as base.

C. Manufacturers:
1. Johnsonite
2. R.C. Musson Rubber Company
3. Burke Flooring Products, Inc.

2.5 ACCESSORIES

A. Subfloor Filler: White premix latex; type recommended by adhesive material manufacturer.

B. Primers and Adhesives: Waterproof; types recommended by flooring manufacturer.

C. Edge (transition) Strips: Flooring material manufactured by Mercer, Johnsonite, or equal, color to match vinyl base color adjacent to strip.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify concrete floors are dry to a maximum moisture content of 7 percent and exhibit negative alkalinity, carbonization or dusting.

B. Verify floor and lower wall surfaces are free of substances that may impair adhesion of new adhesive and finish materials.

3.2 PREPARATION

A. Remove sub-floor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with sub-floor filler to achieve smooth, flat, hard surface.

B. Prohibit traffic until filler is cured.

C. Vacuum clean substrate.

3.3 INSTALLATION - TILE FLOORING

A. Install in accordance with manufacturer's instructions. See drawings for patterns.

B. Mix tile from container to ensure shade variations are consistent when tile is placed.

C. Spread only enough adhesive to permit installation of materials before initial set.

D. Set flooring in place, press with heavy roller to attain full adhesion.

E. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

F. Install tile to turn block pattern. Allow minimum 1/2 full size tile width at room or area perimeter.

G. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

H. Install resilient edge strips at unprotected or exposed edges, and where flooring terminates.

I. Scribe flooring to walls, columns, cabinets, floor outlets, and other appurtenances to produce tight joints.

J. Install feature strips and floor markings where indicated. Fit joints tightly.

3.4 INSTALLATION - BASE

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches between joints.

B. Miter internal corners. At external corners, use premolded units. At exposed ends, use premolded units.

C. Install base on solid backing. Bond tight to wall and floor surfaces.

D. Scribe and fit to door frames and other interruptions.

3.5 CLEANING

A. Vinyl Composition and Rubber Flooring

1. Stripping

a. Strip floor using a slow speed floor machine and green stripping pad. Use Freedom, Bravo or Step-Off stripping products only.

b. Rinse floor at least twice with clean water and let dry. Use wet-vac to remove stripping solution and water.

2. Apply Finish

a. Apply five coats (2,000 to 2.500 SF/gal) of Carefree with clean, pre-rinsed rayon mop, allowing 1 hour minimum dry time between coats. Allow final coat to dry 24 hours before allowing traffic on finished floor.

3.6 PROTECTION OF FINISHED WORK

A. Protect finished Work. Entire floor to be protected with red rosin paper, taped.

B. Prohibit traffic on floor finish for 48 hours after installation.

- END OF SECTION 09 65 19 -

SECTION 09 90 00

COATINGS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Section Includes:

1. Paint or natural finish all interior surfaces not specifically excluded. Includes:

a. All areas indicated on the drawings and included in the schedule noted to be painted.
b. Areas of patch and repair of existing painted components.

B. Exclusions: In addition to material obviously not requiring paint such as stainless steel, plastic laminate, glass, flooring, tile, etc. Do not paint or finish:

1. Surfaces indicated by finish schedule to remain unfinished.

2. Factory finished surfaces indicated to be factory finished.

a. Aluminum with anodized or baked-on finish.
b. Finish hardware, except hardware with USP finish.
c. Electrical devices, fixtures, and trim.

3. Equipment such as mechanical, and electrical equipment located inside equipment rooms.

1.2 RELATED SECTIONS

A. None.

1.3 REFERENCES

A. NPCA (National Paint and Coatings Association) - Guide to U.S. Government Paint Specifications.

B. PDCA (Painting and Decorating Contractors of America) - Painting - Architectural Specifications Manual.

C. OTC-Regulation No.41

D. SSPC-SP 1 - Solvent Cleaning

1.4 SYSTEM DESCRIPTION

A. Performance Requirements: Indoor Air Quality: Provide products which will not adversely affect indoor air quality through emission of toxic gasses or vapors. Do not use materials with residual of formaldehyde, epoxy resin, or urea-based materials.

1.5 SUBMITTALS

A. Submit under provisions of Division 1.

B. Product Data: Provide data on all finishing products and special coatings.

C. Samples: Submit two samples, 6 x 6 inch in size illustrating selected colors and textures for each color selected. Wood stains shall be applied to actual piece of trim material.

D. Manufacturer's Instructions: Indicate special surface preparation procedures, and substrate conditions requiring special attention.

E. Verify in writing that the products specified will be used as directed or submit for approval a list of comparable materials of another listed approved manufacturer, including full identification of all products by name, color and catalogue number adjacent to those specified, with a statement of equality by the proposed manufacturer.

F. Submit Manufacturer’s certification (MSDS Sheet) for each paint and coating highlighting VOC limits and chemical component limits.

1.6 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five (5) years experience.

B. Applicator: Company specializing in performing the work of this section with minimum five (5) years experience and approved by manufacturer.

1.7 REGULATORY REQUIREMENTS

A. Conform to applicable code for flame and smoke rating requirements for finishes.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container label to include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, VOC content, and instructions for mixing and reducing.

C. Store paint materials at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions. Storage space shall be designated by the Contractor and approved by the Architect.

1.9 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

1.10 EXTRA MATERIALS

A. Provide 1 gallon of each color and surface texture to Owner at the completion of the project.

B. Contractor shall label each container with color, type, texture, and room locations in addition to the manufacturer's label. Contractor shall also provide detailed listing by room of color, type, and texture along with manufacturer's name and identification number.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer's: Best quality materials as manufactured by one of following manufacturers will be acceptable:

1. For Brush, Roller or Spray work:

a. Sherwin Williams
b. Benjamin Moore
c. Pittsburgh Paints

B. Quality: All products not specified by name shall be "best grade" or "first line" products of acceptable manufacturers. See Part 3- Execution for materials required for this project. Where possible, provide materials of single manufacturer.

2.2 MATERIALS

A. Coatings: Ready mixed. Process pigments to a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating; good flow and brushing properties; capable of drying or curing free of streaks or sags.

B. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.3 FINISHES

A. Refer to schedule at end of section for surface finish.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate conditions are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application to the Architect and General Contractor.

C. Test shop applied primer for compatibility with subsequent cover materials.

D. Allow masonry work to cure for at least 30 days before coating. Gypsum board shall be allowed to dry for 15 days before coating.

3.2 PREPARATION

A. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Correct defects and clean surfaces which affect work of this section. Remove existing coatings that exhibit loose surface defects.

C. Seal with shellac and seal marks which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Gypsum Board Surfaces: Fill minor defects with filler compound. Spot prime defects after repair.

F. Galvanized Surfaces: Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

G. Concrete and Unit Masonry Surfaces Scheduled to Receive Paint Finish: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

H. Uncoated Steel and Iron Surfaces: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand power tool wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Spot prime paint after repairs.

I. Shop Primed Steel Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Prime metal items including shop primed items.

J. Metal Doors Scheduled for Painting: Seal top and bottom edges with primer.

3.3 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry.

C. Apply each coat to uniform finish.

D. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

E. Sand surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces free of loose particles. Use tack cloth just prior to applying next coat.

G. Allow applied coat to dry before next coat is applied.

3.4 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Refer to Divisions 15 and 16 for schedule of color coding and identification banding of equipment, duct work, piping, and conduit.

B. Paint shop primed equipment.

C. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

D. Prime and paint insulated and exposed pipes, conduit, boxes, insulated and exposed ducts, hangers, brackets, collars and supports, except where items are prefinished.

E. Paint interior surfaces of air ducts, and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to visible surfaces. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

F. Paint exposed conduit and electrical equipment occurring in finished areas.

G. Paint both sides and edges of plywood backboards for electrical and telephone equipment before installing equipment.

H. Color code equipment, piping, conduit, and exposed duct work in accordance with requirements indicated. Color band and identify with flow arrows, names and numbering.

I. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

J. Finished work is to be adequately covered with uniform color and finish. The number of coats herein specified being a minimum, this contract shall provide any additional coats to produce a first-class job. Architect may select accent colors or deeptone colors (contrasting bright colors) for interior painted walls or ceilings. Where bright colors are selected, apply extra coats of paint where required to obtain completely opaque surface. Make allowances for 10 percent deep tones in bid. Additional labor or materials used for this purpose not allowable as extra cost.

K. Objects on Roof: Paint all metal objects on roof including, but not limited to, rooftop mechanical units, flashings, roof drains, vents, exhaust fans, air intake hoods, roof hatches, etc. as specified under ferrous, zinc coated metals.

L. Allow the following minimum drying time between coats:

1. Exterior work-48 hours.

2. Interior work-24 hours.

3.5 PROTECTION AND CLEANING

A. Protection: Protect floors and adjacent surfaces from paint smears, spatters and droppings.

1. Cover fixtures not to be painted. Mask off areas as required.

2. Finish Hardware: Ensure hardware is removed prior to starting painting operations and that it is replaced only after painting operations have been completed.

a. Hardware Removal and Replacement: Section 08710.

B. Damage to Other Work: Be responsible for damage done to adjacent work. Repair damaged work to satisfaction of Architect. Replace materials damaged to extent that they cannot be restored to their original condition.

3.6 SCHEDULE OF COATINGS

1. Interior:

Surface		Area	Type, Luster & Coats
1.	Cementitious Materials	New/Exist. CMU	1 coat: S-W PrepRite Block Filler, B25W25 (16 mils wet, 8 mils dry) 2 coats: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series (4 mils wet, 1.6 mils dry per coat)
2.	Gypsum Board	New/Exist. ceilings, walls, and bulkheads	1 coat: S-W Harmony Low Odor Interior Latex Primer, B11W900 (4 mils wet, 1.3 mils dry per coat) 2 coats: S-W Harmony Low Odor Interior Latex Eg-Shel, B9 Series or S-W Harmony Low Odor Interior Latex Semi-Gloss, B10 Series. (4 mils wet, 1.6 mils dry per coat)

- END OF SECTION 09 90 00 -

SECTION 220499
PLUMBING SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The work to be performed under these Specifications shall include providing all labor, materials, and equipment necessary to furnish and install, complete, properly, and fully all plumbing work as shown on the Drawings or herein specified. It is the intent of these Specifications that a complete operating system be installed; this Contractor shall carefully examine the site, drawings, and Specifications, and shall include all items necessary to accomplish this purpose. The work, in general, shall include, but shall not be limited to the following:

1. **Provide revised wet fire protection systems for areas indicated on Architectural Plan.**

1.3 WORK BY OTHER TRADES

A. Cutting, patching, painting, electrical, revised **fire protection,** etc., shall be done by the affected trade at this Contractor's expense for changes required in work already installed or work required by other trades for changes made by this Contractor in type or size of equipment purchased.

1.4 WORK NOT INCLUDED

A. The following construction and equipment related to the work under this Contract will be provided by others:

1. Openings in new exterior walls. (General Contractor)

2. **Revised building fire protection system. (Separate Fire Protection Contract)**

PART 2 – PRODUCTS

2.1 NOT APPLICABLE TO THIS SECTION

PART 3 – EXECUTION

3.1 NOT APPLICABLE TO THIS SECTION

END OF SECTION 220499

SECTION 221420
WET – PIPE FIRE SUPPRESSION SPRINKLER SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

B. All fire protection system work shall be completed by a licensed, certified, Fire Protection Contractor acting as a subcontractor to the Plumbing Contractor. All work shall be directly coordinated with the local Fire Department.

C. The Plumbing Contractor shall furnish and install a flanged connection at interior water service entrance for beginning the Fire Protection Subcontractor's work. Final connections to flange will be completed by the Fire Protection Subcontractor.

D. All pipe materials shall be subject to the acceptability of that material with the prevailing local fire and plumbing codes, NFPA 13.

E. The Drawings and Specifications for this project are generally schematic and are intended for bidding purposes only **and are not intended to cover each item required for a total system as outlined in NFPA 13.** The minimum spacing, quantity and arrangement of proposed sprinkler locations, equipment, piping, and standpipes indicated on the Drawings generally are diagrammatic. The exact arrangement, sizes, quantity and spacing required by the agencies having jurisdiction shall be indicated on the Working Drawings that are to be prepared by the Contractor.

1.3 SCOPE

A. The revised fire protection work to be performed shall include the following, but not necessarily limited to:

1. Furnish and install Contractor-hydraulically designed revised wet fire protection systems, including all required drain piping and accessories, complete in every detail.

2. Directly after award of Contract, regardless of dates of existing flow tests; or flow test data obtained or shown on any drawings; and prior to any submittal, the Contractor shall be responsible for conducting and obtaining new flow test data. Obtain water flow, pressure, capacity data, elevations, and other related pertinent information from the nearest available fire hydrant(s), and as arranged with the Water Authority serving the building. Arrange any times and dates with the Water Authority. Water flow test data obtained from the Water Authority will not be acceptable, regardless of when such flow tests were performed. Include all costs involved with obtaining the flow test data, including the use of special tools, equipment, and accessories and include in the Contract Bid. Typed copies of confirmed flow test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

3. Directly after award of Contract, the Contractor shall obtain and confirm latest test data performed on the existing fire pump system. Existing test data shall be obtained from the Owner of the building and must have been performed within the last twelve (12) months of the Contract Bid Date. If later than twelve (12) months, the Contractor shall perform

the necessary fire pump system tests to obtain this data. Include all costs involved with conducting the pump test and include in the Contract Bid. Scheduling of the fire pump system tests shall be directly coordinated with the Owner and the local Fire Department. Typed copies of fire pump test results shall be furnished by the Contractor to the Professional and the Architect. Approval by the Architect of Contractor's test results is necessary prior to forwarding submittals or beginning any work.

4. Include all tests, permits, and fees, including all costs involved.

5. Contractor shall complete all Contractor's Material and Test Certificates for above ground installations.

1.4 CODE COMPLIANCE

A. All fire protection work and materials herein described shall comply with all applicable federal, state, county, health, and local laws, ordinances, rules and regulations, and all other local authorities having jurisdiction and shall be subject to the approval of these authorities, notwithstanding anything in these specifications to the contrary. In addition, all work and materials to be provided under this Section of the Specification shall conform to the applicable requirements of the National Board of Fire Underwriters Standards, and the National Fire Protection Association Standards; special reference is made to NFPA 13, Standard for the Installation of Sprinkler Systems, Standard for the Installation of Standpipe and Hose Systems. All threads shall conform to the local Fire Department Standards; confirm prior to ordering.

1.5 SHOP DRAWINGS

A. Product Data: Submit manufacturer's technical product data and installation instructions for all fire protection materials and products.

B. Approval Drawings: All fees for this approval shall be by this Contractor. Prepare approval drawings of the fire protection systems coordinated with other mechanical, electrical, structural and general building drawings, of the fire protection systems proposed by the Plumbing Contractor and submit prints of the drawings to the appropriate governmental, health, and underwriting agencies for their review and approval. Prints bearing the approval stamp of the Underwriting Agency, authorized Fire Marshal and other Authorities having jurisdiction shall be submitted to the Architect prior to the commencement of any fabrication or installation of any portion of the system. The drawings shall include all of the following information and whatever additional information that may be required by the authority having jurisdiction.

1. All sets of drawings with appropriate NFPA standards listed.

2. System type.

3. Total number of risers.

4. Sprinkler spacing and locations with dimensions showing all lighting fixtures, diffusers and return air grilles.

5. Occupancy type.

6. Hazard classification.

7. Hangers, types and details.

8. Temperature and type of sprinkler heads.

9. Sprinkler system accessories.

C. Approval Calculations: Prepare hydraulic calculations of fire protection systems to determine all pipe sizes. Submit to Agency having jurisdiction for approval. Submit one approved copy, bearing stamp and/or signature of Agency having jurisdiction to the Architect before proceeding with the installation.

D. Certificate of Installation: Submit certificates upon completion of fire protection work which indicates that work has been installed and tested in accordance with NFPA 13, and also that the system is operational, complete and has no defects.

E. Record Drawings: At project closeout, submit record as-built drawings of installed fire protection piping and products.

F. Maintenance Data: Submit maintenance data and parts lists for fire protection materials and products. Include this data, product data, shop drawings, approval drawings, approval calculations, certificate of installation and record drawings in maintenance manual.

PART 2 - PRODUCTS

2.1 FIRE PROTECTION PIPING INSIDE BUILDING

A. Pipe:

1. All wet system piping herein specified shall be UL Listed and FM Approved. Pipe shall be as manufactured by Allied Tube & Conduit, Youngstown Tube Co., or Wheatland Tube Company. For the wet-pipe systems only, all piping that utilizes threaded fittings shall be Schedule 40 black steel. “Plain-end” pipe/fittings and threadable light-wall pipe are not permitted. Sprinkler piping 1-1/4” in diameter or larger, connected by welded, flanged fittings or roll grooved fittings, shall be Schedule 40 or Schedule 10 as permitted by NFPA 13. Cut grooves are not permitted. All sprinkler piping 2” in diameter and smaller (that is not roll grooved or welded) shall be Schedule 40 utilizing screwed fittings (plain end fittings will not be accepted). All miscellaneous drain and test piping and fittings shall be Schedule 40, internally and externally galvanized. All piping shall include factory coating of the inner wall of piping, to guard against MIC (microbiologically influenced corrosion). The coating shall adhere to the wall of the pipe, thereby providing protection against contamination and pipe deterioration by impeding the attachment of microbes to the pipe wall.

   a. Where piping is exposed it shall be steel pipe, as specified herein.

2. Instead of hard-pipe armovers above ceiling areas, the Contractor will be permitted to use a flexible stainless-steel hose to connect sprinkler heads to the branch lines. System shall be UL Listed and FM Approved type, conforming to NFPA 13, as manufactured by FlexHead Industries, Inc., Fivalco, Inc., AquaFlex, or Gateway Tubing, Inc. Flexible hose shall be rated up to 300 psi, in 2-6 foot lengths. Each system shall be factory pressure and leak-tested. Approval on models of flexible metal sprinkler hose is limited for use in commercial suspended or sheetrock ceilings, with ceiling bracket assembly, without hangers. System shall be approved for use in suspended ceilings with light, medium, and heavy load grids (ASTM C635, C636). System will not be acceptable for exposed sprinkler system installations. System shall be installed in strict accordance with manufacturer’s installation instructions. System installation must be acceptable to the Owner and Fire Insurance Carrier.

B. Hangers for the fire protection system shall be UL Listed, FM approved. Contractor's attention is directed to "Unsupported Armover Lengths", for pipe hanger installations for pressures above and below 100 psi, in accordance with NFPA 13

C. Fittings:

1. For wet-pipe system, 150 psi, screwed malleable iron, or Victaulic FireLock ductile iron fittings and FireLock EZ ductile iron, Nibco Steelok, or Tyco couplings for grooved end piping. Grooved end fittings and couplings shall be UL Listed and FM approved and shall be the products of a single manufacturer. Grooving tools shall be supplied by the same manufacturer as the grooved components.

2. Flange adapters shall be ductile iron, flat faced, designed for incorporating flanged components with ANSI Class 125 and 150 bolt-hole patterns to a grooved piping system. Victaulic Style 741 or 744 or approved equivalent.

D. Valves shall be as manufactured by Nibco, Victaulic, or Tyco.

1. For sizes 2" and smaller, valves shall be bronze ball type, 175 pound WWP minimum, UL, FM, threaded or grooved body style, the Victaulic FireLock Series 728, or approved equivalent. The Nibco No. T-104-0, threaded, UL, FM valve, bronze gate, 175 pound WWP minimum, will be acceptable, or approved equivalent. For sizes 2-1/2" and larger, valves shall have iron body, 200 pound WWP minimum, UL, FM, with resilient wedge, flanged ends, the Nibco F-607-RW, grooved ends, Victaulic Series 771, or approved equivalent.

2. Inspector's test and drain valves shall be 175 pound WWP minimum, bronze screwed, angle, or straight globe valves, UL Listed, rubber disc, the Nibco No.'s KT-65 UL, KT-67 UL, KT-211-W-UL, or approved equivalent. The Nibco No. KT-580-70-UL and No. KT-585-70-UL, threaded, bronze ball valves, UL listed, 175 pounds WWP, will be acceptable.

3. The AGF Model 1000 Test and Drain, UL, FM approved, Victaulic Styles 720 TestMaster Alarm Test Module, or Sure-Test shall be utilized for drain systems.

E. Sprinkler Heads: All sprinkler heads shall be the product of a single manufacturer, UL Listed, and FM approved. All heads shall be the same model year and style throughout. The Architect must approve any deviations. Sprinkler heads shall be of a type, upright, pendent, or sidewall that is best suited to the conditions in which they are installed. Heads shall be as manufactured by Viking, Tyco, or Victaulic. Provide quick response sprinkler heads where required, in accordance with NFPA requirements. Heads which must be painted, shall be factory-painted only. Where required, heads shall be of a design suited to the protection of areas having irregular building design and structural arrangements such as cornices, soffits, beams and columns or building environmental systems such as light fixtures, grilles and diffusers, or building furnishings and equipment. Full consideration shall be given in the spacing of heads, of the type of head, and the arrangement of the piping to afford the protection required to be installed. Temperature ratings of all heads shall be coordinated with the NFPA 13 requirements. Provide higher temperature heads near heat – producing equipment. The Victaulic "strapless" style sprinkler heads will not be acceptable. The finish and type of sprinkler heads in finished areas must be approved by the Architect.

1. In general, sprinkler heads in finished areas with ceilings shall be fully recessed, concealed type. Heads shall include finished flat coverplate installed flush with ceiling, the Viking Mirage (QR, 5.6K, VK462), Victaulic Model V38, or approved equivalent. Finish and color of flat coverplate shall be as selected by the Architect.

2. Where indicated on the drawings, sprinkler heads shall be semi-recessed, extended coverage, chrome finish, the Viking Microfast (QR, 5.6K, VK600), or approved equivalent.

3. Use chromed heads on exposed piping or concealed piping in finished areas.

4. Sidewall heads having a bronze finish or chrome finish shall be the Viking Model M (QR, 5.6K, VK305), Victaulic Model V27, or approved equivalent.

5. Concealed horizontal sidewall sprinkler heads shall be quick response, extended coverage, UL Listed, and shall be the Viking VK630, with 14' x 26' coverage, Reliable, or Tyco.

6. In areas subject to corrosive atmosphere, heads shall be lead coated, Nickel-Teflon coated, or wax coated as required.

7. Coordinate installation of sprinkler heads with surface mounted lighting fixtures for proper clearances.

8. Install sprinklers under all ducts or obstructions greater than 48" in width in accordance with NFPA 13.

F. In accordance with UL listing requirements, protective caps or straps shall be required for all glass bulb sprinklers. The caps or straps shall be removed from the sprinklers only when the system is "placed in service", in accordance with NFPA definitions. Protective caps and straps shall be removed only using means in accordance with manufacturer's installation instructions. "Dropped" glass sprinklers, with or without protection, shall be replaced. Solder element sprinklers are not required to be protected with caps or straps.

G. Flushing: Completely flush out piping systems included under this Contract.

H. Escutcheons: All pipe escutcheons shall be chrome, cast brass, set screw type.

PART 3 - EXECUTION

3.1 SPRINKLER SYSTEM INSTALLATIONS

A. All systems shall be fully automatic, shall be complete in all detail, and shall be provided with all the required components and devices necessary to install approved systems.

B. The layout of the sprinkler system, the arrangements of the heads; and the location and size of main and branch piping shall be developed from the design requirements of the applicable sprinkler criteria and the limitations imposed by the structural and architectural design. However, the degree of protection, hence the exact spacing and arrangement of the sprinkler heads and pipe sizes in any area shall be as required by the authority having jurisdiction.

C. Rearrangement of branch piping and adjustment of the pipe sizes, where proven by hydraulic calculations and when approved by the authorities having jurisdiction, and where compatible with the building design, may be made in the preparation of the Shop Drawings.

D. In finished areas, sprinkler heads shall be uniformly spaced and patterned to suit the ceiling finishes, decorations and interferences. In unfinished areas, the pattern of spacing and the coverage shall be as determined by the shape of the space and the interferences caused by construction details and the furnishings of the space. Maximum spacing shall not exceed that

permitted by the authority having jurisdiction. Sprinkler heads in “lay-in” ceilings shall be centered in both directions.

E. Additional spare sprinkler heads of each type shall be provided to the Owner. Not less than six (6) heads or 2% of the total number of each type of head shall be furnished to the Owner for storage. Furnish and install a metal wall storage cabinet, mounted where directed by the Architect. Storage cabinet shall be as manufactured by Tyco, Victaulic, or Viking. A wrench suited to each type of head shall also be provided in the cabinet.

F. Test pipes with control valves shall be provided as required in the fire protection system.

G. Grooved joint piping systems shall be installed in accordance with the manufacturer's guidelines and recommendations. All grooved couplings, fittings, valves, and specialties shall be the products of a single manufacturer. Grooving tools shall be of the same manufacturer as the grooved components. The gasket style and elastomeric material (grade) shall be verified as suitable for the intended service as specified. Grooved end shall be clean and free from indentations, projections, and roll marks in the area from pipe end to groove for proper gasket sealing. A factory-trained field representative shall provide on-site training for contractor's field personnel in the proper use of grooving tools and installation of grooved piping products. Factory-trained representative shall periodically review the product installation. Contractor shall remove and replace any improperly installed products.

3.2 FIRE PROTECTION SYSTEM TESTS

A. Before the completed revised fire protection system is accepted by the Owner, the entire system included under this Contract shall be pressure tested by the Contractor and approved in the presence of representatives of the Owner, the Architect, local Fire Department, local authorities, the Insurance Underwriters, and any other parties directly concerned.

B. This Contractor shall furnish all labor and equipment and shall conduct and bear the cost of all required tests of the fire protection system. This Contractor shall give all concerned parties three days advance notice of scheduled tests; 48 hours to Water Authority

C. The entire fire protection system included under this Contract shall be tested under a hydrostatic pressure of not less than 200 lbs. for at least two hours, or at 50 psi in excess of the maximum static pressure when the maximum static pressure is in excess of 150 psi, or as otherwise required or directed by the local Fire Department. Testing of underground service main piping shall conform to NFPA 24 requirements. All defective work shall be promptly repaired or replaced with new pipe and fittings, etc.

D. Tests shall be repeated until the installation receives the approval of the Architect and all parties concerned.

E. Any damage resulting from the tests shall be repaired and/or damaged materials replaced, all to the satisfaction of the Architect, at the expense of this Contractor.

END OF SECTION 221420

SECTION 230505

HVAC SCOPE

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 DESCRIPTION OF WORK

A. The Contract requirements include the providing of all labor, materials, equipment and appliances, and in performing all operations in connection with the installation of HVAC Construction Work complete for this Project, in strict accordance with this Section of the Specifications and the applicable drawings.

B. At the completion of the project, all systems shall be calibrated, tested, balanced, commissioned, and all systems shall be operating as intended.

C. Contractor is hereby bound by all applicable portions of all Contract Documents and Supplemental Specifications bound herein or included by reference.

D. In all cases where a device or part of equipment is herein referred to in the singular, such reference applies to as many such items as are required to complete the installation.

E. Provide all related and miscellaneous components or appurtenance to make all specified systems complete and functional.

F. Perform all work in accordance with work of all other contractors on this project.

G. Install work in phases during the construction period; coordinate mechanical schedule and operations with other trades and with construction schedule.

H. The work to be performed by the HVAC Contractor under these Specifications and the accompanying Drawings comprises the furnishing of all labor, materials, tools, and other services and facilities necessary for the complete installation of, but not necessarily limited to the following:

1. Demolition
    a. Perform pre-demolition tested as indicated on the Contract Drawings. Measure and record air flows at all indicated air devices prior to demolition work, and submit record report to the Architect.
2. New

a. Provide all testing and balancing of all existing to remain air devices, as indicated on the Contract Drawings.

1.3 WORK BY OTHERS

A. The following construction and equipment related to the work under this Contract will be furnished or provided by others, unless noted otherwise:
   1. Final painting of new interior surfaces. (General Contractor)
   2. Final painting of existing interior walls, floors and ceilings where the surfaces are being refinished and remodeled under the General Contract. (General Contractor) Where the existing area is to be repainted by the General Contractor, the HVAC Contractor must repair his openings ready to paint. Refer to General Construction drawings for finishes.
   3. Recesses and opening in new construction for piping and equipment. (General Contractor)

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

NOT USED

END OF SECTION 230505

SECTION 230506

BASIC HVAC MATERIALS AND METHODS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 HVAC WORK

A. The word "building" used throughout these specifications shall be interpreted to mean the entire Building Complex.

B. The actual runs and locations of all piping, ductwork, equipment, etc., shall be determined at the site and shall be installed to meet the various conditions at the building. It is, however, the HVAC Contractor's responsibility to predetermine the exact locations of ductwork, piping, and equipment, and to notify the other contractors accordingly to avoid confliction with other lines and equipment. Any changes necessary to conceal pipes, ductwork or clear pipes and equipment of other trades shall be made without additional expense to the Owner. This Contractor shall be responsible to create ductwork and HVAC piping coordination drawings and distribute to other contractors for coordination and sign off. Refer to Subsection 3.5 for further clarification.

C. No piping, ductwork or equipment shall be installed without first obtaining sign off from the other trades. Should such installation occur and then subsequent conflicts arise, this Contractor shall, at his own expense, remove all that is in conflict and reinstall appropriately.

D. All work shall be executed and all equipment constructed and installed in accordance with the requirements of the State Building Code, the Department of Labor and Industry, ASME, Department of Environmental Resources, Department of Labor, Safety and Health Regulations for Construction, OSHA, National Fire Protection Association, the National Electrical Code as amended to date of bidding, and all federal, state, county and local ordinances and regulations. Nothing contained in these specifications or shown on the drawings shall be construed to conflict with the aforesaid codes, ordinances, or regulations. Certificates of approval shall be obtained from any department issuing same, and shall be turned over to the Owner at the completion of the work. All fees and permits required shall be satisfied and obtained by the Contractor and the cost shall be included in the Contract price.

E. The Contractor shall carefully examine the general building drawings and all mechanical and electrical drawings, and carry on his work so as not to delay or interfere with the work of other trades. He shall obtain in writing from the other contractors such data as is necessary to coordinate his work with other branches. As the work in the building nears completion, all threading, cutting, etc., shall be done where directed by the Architect. Upon completion of the

work, all remaining waste materials and rubbish resulting from the Contract work shall be removed from the building and premises. The Contractor shall review the phasing schedule and meet all requirements of the schedule. The building must be kept in use at all times.

F. Where the phrase "or approved equivalent," "or equivalent" or "approved" appears in these specifications, it shall refer to the approval of the Architect on the material or equipment involved.

G. The terms "The Contractor" or "This Contractor" or "the HVAC Contractor" mentioned in these specifications refers to the Contractor responsible for the work and equipment included in these specifications.

H. The General Contractor will provide chases and openings in walls, floors, ceilings, and partitions of new construction to receive pipe lines, risers, ducts, and other equipment insofar as it is possible to predetermine the exact location, but the Contractor shall install his work sufficiently in advance of the building construction to permit his work to be built into place. This Contractor shall advise the General Contractor of the exact size and location of all chases and openings required for the installation of his work, and shall check size and location of all such chases and openings provided by the General Contractor.

I. The Contractor shall do all cutting and patching required for the installation of his work.

J. Advance work as rapidly as possible to permit the heating and cooling systems to be used when it is required for all areas of the building. The installation of equipment shall follow the phasing schedule. Instruct the Operating Personnel as to the proper care and maintenance of all systems. However, this Contractor shall operate the new systems until the new systems are complete while the building is under construction. He shall also coordinate the operation of the system with the Owner so that heat remains on in all areas during construction. Provide all required temporary heat as directed by the Construction Manager.

K. Equipment and materials of similar types shall be of the same manufacturer unless specifically indicated otherwise on the drawings or herein specified. All materials shall be strictly in accordance with the quality, style, and sizes as specified herein. Manufacturers' names and plate numbers are given in the specifications to denote a standard of quality, style, size, and type and shall exclude material of other manufacturers. The Contractor shall make final connections between all equipment furnished under this Contract and equipment furnished under other contracts as noted.

L. The materials used throughout shall be those of reputable manufacturers and shall be new and the best of their respective kinds. All equipment, components and materials shall be installed in a neat and workmanlike manner in accordance with best trade practices, manufacturer's recommendations, and applicable codes and standards and by men skilled in each particular branch of the work assigned to them. All work shall be installed subject to the approval of the Architect.

M. The Contractor shall be entirely responsible for all apparatus, equipment and appurtenances furnished by him or his Subcontractors in connection with the work, and special care shall be taken to protect all parts thereof in such manner as may be necessary or as may be directed. Protection shall include covers, crating, sheds, or other means to prevent dirt, grit, plaster, or

other foreign substances from entering the working parts of machinery or equipment. Special care shall be taken to keep all open ends of pipes, ductwork, VAV/CAV Boxes and all other equipment, etc., closed while in storage and during installation. Where equipment must be stored outside the building, it shall be totally covered and secured with heavy waterproof tarps and kept dry at all times. Where equipment has been subjected to moisture, it shall be suitably dried out before placed in service. Materials and equipment shall be stored in areas designated by the Architect.

N. Grades, elevations and locations shown on the drawings are approximately correct; however, the Contractor shall field check and otherwise verify all such data at the site before proceeding with the work. The Contractor shall make necessary survey equipment available at all times and shall make use of such equipment wherever necessary to properly install his equipment.

O. The Contractor shall visit the site and thoroughly acquaint himself with conditions existing at the site before submitting his proposal as he will be held responsible for the installation of the work complete in every detail. The Contractor shall especially review the phasing schedule and ensure compliance with this schedule.

P. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

Q. Carefully examine all drawings included under this Contract and drawings included under other contracts and report any discrepancies noticed to the Architect as this contractor shall be responsible for the HVAC system installation in its entirety.

R. Due to the small scale of the drawings, it is not possible to indicate all offsets, fittings, valves, dampers, access panels, and similar parts which may be required. The drawings are diagrammatic and generally indicative of the work to be installed. The Contractor shall carefully investigate the structural and finish conditions affecting the work and arrange all work accordingly, furnishing necessary parts and equipment as may be required to meet the various conditions.

S. Contractor shall layout his work from dimensions of Architectural Drawings.. Layouts in congested areas should not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry, OHSA and the National Electrical Code.

T. The Contractor shall furnish the services of manufacturers' representatives for all equipment furnished under these Contract Documents. The amount of factory service provided by the Contractor shall be as normally recommended and furnished by the various equipment manufacturers unless specified otherwise. Testing of such systems and equipment shall be made under the direct supervision of competent authorized service representatives and the Commissioning Agent. Any and all expenses incurred by the equipment manufacturers' representatives shall be borne by the Contractor.

U. All equipment and materials shall be manufactured in accordance with national standards established by manufacturer's associations, engineering and testing societies, such as NBMA, NEMA, ASTM, AMCA, ASME, ANSI, ACI, etc., where such standards have been established.

V. When the installation is reported in writing by the Contractor to be complete and ready for acceptance, tests and inspection shall be made by the Contractor in the presence of the Architect to ascertain whether it complies with the specifications and Contract, and upon its failure to do so, the Contractor shall at once remedy all defects and shortcomings and any additional tests that may be required shall be entirely at the Contractor's expense. All of the testing work shall be done when and as directed by the Architect before the system is accepted.

W. The Architect/Engineer reserves the right to revise locations of piping, ductwork, locations of equipment, etc., within the building as long as sizes remain the same.

X. In all cases where equipment and materials are specified in the singular or plural number, it is intended that such reference shall apply to as many such items as are required to complete the installation.

Y. The Contractor will be responsible for the completion of all work included under this Contract and shall employ skilled and qualified tradesmen as necessary to satisfy all work and trades.

1.3 PERMITS, CODES AND INSPECTIONS

A. Obtain and pay for permits and inspections required by laws, ordinances, rules and regulations having jurisdiction for work included under Contract. Obtain certificates of each required inspection as construction progress dictates, and submit same to the Owner's Representative prior to acceptance of the Work.

B. Systems and installation work shall be completed in accordance with the 2015 International Building Code, 2015 International Mechanical Code, and 2015 International Energy Conservation Code.

C. Do work in accordance with all applicable requirements including but not limited to National Fire Protection Association, Underwriter's laboratories, Inc., National Electrical Code, O.S.H.A., and other regulatory bodies having jurisdiction over this class of work. Where applicable, materials and equipment shall bear stamps or seals of NFPA, UL, ASME, AMCA, NEMA, IEEE, NEC, and other recognized regulating agencies.

1.4 DEFINITIONS

A. To clarify and establish relationships for responsibility of work to be performed under this section, designations underlined in the subsequent paragraphs of this Article are defined.

B. Provide shall mean that work or equipment thus described shall be furnished and installed complete and all responsibility and costs relative thereto shall rest with designated Contractor or Subcontractor.

C. Furnish shall mean that equipment thus described shall be purchased by this Contractor or Subcontractor and delivered to job site for installation or erection under this or another contract or subcontract. Furnishing contractor shall be responsible for including installation data and

competent supervision assistance to coordinate equipment or components into working and operable systems.

1. Magnitude of installation data and supervision assistance shall be as specifically stated elsewhere herein, or the minimum as interpreted by the Owner's Representative.

D. Contractor as stated herein shall mean HVAC Contractor or Subcontractor unless specifically designated as General Contractor, electrical Subcontractor, etc. If trades or sections of work are prime or sublet, the term "Contractor" shall be used as applicable to Contractor or Subcontractor as defined by the division established by the Contract Documents.

E. Contract as stated herein shall mean HVAC Contract or Subcontract unless specifically designated as General Contract, Electrical Subcontract, etc. If trades or sections of work are prime or sublet, the term "Contract" shall be used as applicable to Contract or Subcontract as defined by the division established by the Contract Documents.

F. Inspect, Inspection, Inspector: To inspect the work of contractors means to observe the work of those contractors and/or subcontractors on all tiers responsible for implementing Consultant's plans, specifications, reports, and other instruments of professional service. An inspector has no authority or responsibility to direct any construction workers, and may not stop the work. An inspector is not responsible for, and does not have the education, training, or experience needed to affect the means, methods, sequences, or operations of construction, or safety procedures attendant thereto.

G. Accepted shall mean accepted by the Owner's Representative.
Approved shall mean approved by the Owner's Representative.
Equivalent shall mean equivalent approved by the Owner's Representative
Directed shall mean directed by Owner's Representative.
HC or HVAC shall mean Heating, & Ventilating Contractor.
PC shall mean Plumbing Contractor.
EC shall mean Electrical Contractor.
GC shall mean General Contractor.*
NEC shall mean National Electrical Code, latest revision.
AFF shall mean Above Finished Floor or Grade to centerline.
FBO shall mean Furnished By Others.
*"General" Contract Work may be performed by various contractors.
See documents for division of responsibilities.

1.5 SHOP DRAWINGS AND SUBMITTALS

A. Refer to Architect’s specifications for submittal requirements.

B. Submit Record (As-Built) Drawings. Refer to Paragraph 3.03

1.6 SUBSTITUTIONS

A. Throughout the Specifications, types of materials may be specified by manufacturer's name and catalog number in order to establish standards of quality and performance and not for the purpose of limiting competition. Unless specifically stated otherwise, the bidder may assume the phrase "or approved equivalent," except that the burden is upon the bidder to prove such equality. If the bidder elects to prove such equality, he must request the Architect's approval in writing to substitute such item for the specified item, and shall submit supporting data, and samples if required, to permit a fair evaluation of the proposed substitution with respect to quality, serviceability and warranty. All data pertinent to the proposed substitution shall be submitted to the Architect at least 10 days prior to the bid date for evaluation and review purposes. If the Architect accepts the proposed substitution, an addendum will be issued to all bidders advising all bidders that this substitution will be acceptable from all bidders.

B. Substitutions of equipment other than that specified must be very carefully checked to assure that no problems will occur due to dimensional differences, code requirements, connection points, weights, etc. Where the Contractor elects to substitute materials or equipment approved by the Architect for those specified, the Contractor will be held responsible for all architectural, structural, mechanical, and electrical changes required for the installation of the substituted materials at no additional cost to the Owner. All tests required to substantiate the equivalence of the material will be the obligation of the Contractor.

C. When this Contractor desires to furnish equipment of a manufacturer other than that specified or intended, he shall include a complete specification of the substituted item, along with each submission copy of shop drawings, indicating the necessary modifications to the substituted product to satisfy the requirements of the Contract Specifications. Manufacturer's specifications shall be written as close as possible over the Contract Specifications and each paragraph shall bear the same paragraph number as the Contract Specifications so that close comparison can be made. All submissions will be rejected should they not include the comparison specification. Comparison specification shall be submitted for approval 10 days prior to the Bid Date. If prior approval is not obtained, no substitutions will be considered and the Engineer reimbursed for time spent to reject and return such submission.

D. The verification specification shall include the exact wording of the Contract Specification and the revised wording identified properly indicating all the deviations proposed. If no deviations are noted, the Contractor must furnish the material or equipment in accordance with the Contract Specifications.

E. Should the Contractor elect to propose a substitution after the project has been awarded, the Contractor will be billed for the time spent by the Architect and his consultants in evaluating the proposed substitution. This billing shall occur whether the proposed substitution is accepted or rejected and shall be at the rate of the direct cost to the Architect times a 2.5 multiplier.

F. The submissions are the Contractor's documents, and the Architect's and Engineer's approval constitutes an acknowledgment that the documents have been submitted and nothing more. It is the Contractor's responsibility to check his own submissions for compliance with the Contract Documents and job conditions.

1.7 QUESTIONS AND CLARIFICATIONS OF BID DOCUMENTS

A. Bidders shall not rely on any verbal clarification of the Drawings and Specifications. Any questions or clarifications shall be referred to Engineer at least seven (7) working days prior to bidding to allow for issuance of an addendum.

1.8 MECHANICAL PLANS

A. The mechanical plans are intended to be diagrammatic and are based on one (1) manufacturer's equipment. They are not intended to show every item in its exact location, the exact dimensions or all the details of the equipment. The Contractor shall verify the actual dimensions of any specified or substituted materials and equipment to ensure that they will fit in the available space. All apparatus shall be located as closely as conditions will permit and deviations there from shall be made only with the consent of the Engineer and without additional charge. The right is reserved by the Engineer to make any reasonable changes in the location of the equipment prior to rough-in without invoking additional expense. This contractor shall be responsible to create and distribute for sign-off amongst other trades ductwork and HVAC piping coordination drawings. Refer to Subsection 3.5 for further clarification.

1.9 SPECIAL ENGINEERING SERVICES

A. In the instance of Mechanical and Control systems, such as all major and special equipment, heating equipment, controls, fans, or similar miscellaneous systems and equipment, the installations, final connections and testing of such systems shall be made under the direct supervision of competent authorized service engineers who shall be employed by the respective equipment manufacturer and/or an authorized representative. Any and all expenses incurred by these equipment manufacturers' representatives shall be borne by the Contractor.

1.10 SCHEDULE OF WORK

A. The Contractor shall arrange his work to comply with the Architect’s schedule and the published or revised phasing schedule. The Contractor shall submit a complete schedule of work to the Architect for approval at the beginning of the Contract in accordance with the phasing schedule. The schedule shall clearly indicate the proposed order in which the various parts of the work will be undertaken and the estimated time required for the completion of each particular part of the work. All work shall be coordinated with work being performed by contractors of other trades, with the Owner and phasing schedule.

B. The schedule of work may be revised periodically during the course of construction, but each revised schedule must be approved by the Architect.

1.11 LOCATIONS

A. Obtain detailed and specific information regarding location of all equipment, as the final location may differ from that indicated on drawings. Relocate work improperly placed because of Contractor's failure to obtain this information and reinstall as directed, without additional expense to Owner.

B. The design is subject to such revisions as may be necessary to overcome building obstructions. No changes are to be made in location of equipment without prior written approval by Architect.

C. Owner's Representative reserves the right to change locations of equipment, diffusers, registers, thermostats, plumbing fixtures, floor drains, and other items prior to roughing-in, up to a distance of 25 feet without additional charge by the Contractor.

D. Door swings may vary from plans. Take note of actual door swings at time of rough-in. Do not install thermostats, switches or other items behind the swing of any door.

1.12 PAINTING

A. All painting shall be included under the General Contract.

1.13 DRAWINGS AND SPECIFICATIONS

A. Carefully examine the drawings and specifications for architectural, structural and other Divisions and Sections of the Work. If any discrepancies occur between the drawings, or between the drawings and specifications, report such discrepancies to the Owner's Representative in writing and obtain written instructions as to the manner in which to proceed. No departures from Contract Drawings will be made without prior written approval of Owner's Representative.

B. Report any discrepancies at least 72 hours prior to submission of a bid. Questions received less than 72 hours prior to date of bid opening will not be answered by formal written addendum. Oral and other interpretations or clarifications will be without legal effect. In the event such discrepancies are not reported and claims for extra charges to any contract result, such claims will be allocated to, and charged to, the Contractor who, in the judgment of Owner's Representative, is the responsible party.

C. In the event of questions or disputes as to intent or meaning of Contract Drawings or Specifications, an interpretation will be given by the Owner's Representative and said interpretation will be final and binding.

D. Specifications and the Drawings are not intended to define all details, finish materials, covers, fittings and special construction which may be required or necessary. Furnish, install and connect same in order to make installation complete and adequate as implied by Specifications and Drawings.

E. Drawings are diagrammatic only and do not show exact routes and locations of equipment. Familiarize yourself with the work of other contractors and arrange your work to avoid conflicts. In the event of conflict of work with existing conditions and work of any other contractor, obtain a new approved location of work from Owner's Representative.

F. Because of the small scale of the Drawings, it is not possible to indicate offsets in piping, conduit and ductwork, pipe, fittings, valves, access panels and similar items which may be required to make a complete operating system. Carefully investigate conditions affecting work and install work in such manner that interferences between pipes, ducts, conduit, equipment, architectural and structural features will be avoided and provide such offsets, fittings, access panels or valves as may be required to meet conditions at the building, and in accordance with applicable codes or governing body so as to avoid such interferences, without additional cost to the Owner.

G. Specifications and drawings are complementary, include work shown on drawings but not specified, and vice versa, as if both shown and specified. All work shown on the drawings and not specifically included in the specifications shall be considered a part of the Contract work. All work included in the specifications and not specifically included on the drawings shall also be considered a part of the Contract work.

H. Consider work new even though no mention is made of new, unless otherwise indicated to the contrary herein or on the drawings.

I. When work has been completed and before final approval, deliver to the Owner's Representative a complete set of prints of contract drawings, properly and clearly marked in colored pencil, to show all changes made in original contract drawings and to represent the work as constructed.

J. Contractor shall layout his work from dimensions of Architectural and Structural Drawings and actual dimensions of equipment being installed. Layouts in congested areas shall not be scaled from Mechanical and Electrical Drawings. Clearances shall be provided on all sides of equipment as required for proper maintenance purposes and as required by the Department of Labor and Industry.

1.14 UTILITIES

A. Be responsible for all coordination and scheduling of construction as necessary for the performance of work under your Contract.

B. Unless otherwise indicated, be responsible for payment of all utility charges for installation/connection/on site construction for work required under your Contract.

1.15 PROTECTION

A. Effectively protect at own expense, such of work, materials or equipment as are liable to loss, damage or injury during the construction period and be held responsible for any such loss, injury or damage until work is fully and finally accepted.

B. Refer to Division 01 for additional requirements.

1.16 SKILLED MECHANICS

A. Install work under the Contract in a neat and workmanlike manner. Work which in the judgment of the Owner's Representative is not so installed: remove and replace to his satisfaction, at your expense. Do work with workmen skilled in their respective trade. Leave areas broom clean and equipment clean of dirt, rust, dust, tags and fingermarks.

1.17 TRADE NAMES

A. Trade names and manufacturer's equipment numbers are used to amplify the specifications and establish type and quality of equipment specified.

B. If substitute equipment offered for use requires material or equipment beyond that shown or required by this contract, it will be provided at Contractor's expense, regardless of trade involved.

C. Substitutions will be accepted as delineated in Division 01.

1.18 PERFORMANCE OF EQUIPMENT

A. Materials, equipment and appurtenances of any kind shown on drawings, hereinafter specified, or required for completion of the work in accordance with the intent of these specifications, will be completely satisfactory and acceptable as regards operation, performance and capacity. No approval, written or verbal, of any drawings, descriptive data or samples of such material, equipment or appurtenances will relieve you of your responsibility to turn over complete installation of heating and ventilating systems to the Owner's Representative in perfect working order and in complete conformance with Drawings and specifications at completion of the work.

B. Any material, equipment or appurtenances, the operation, capacity or performance of which does not comply with requirements of Drawings and Specifications, or which is damaged prior to acceptance by the Owner's Representative will be held to be defective material and will be removed and replaced with proper and acceptable materials, equipment and appurtenances or put in proper and acceptable working order, satisfactory to the Owner's Representative.

1.19 AVAILABLE SPACE

A. Be responsible for verifying dimensions of available space for equipment to be installed under this Contract, and verify dimensions of new equipment prior to delivery. After delivery of new equipment, if it is found that it does not properly fit available space, with required clearances, remove the equipment from the project site and provide equipment to fit available space, at no additional cost to Owner. Be responsible for rigging new equipment required under Contract, through the building, and provide cutting and patching of building construction for rigging of equipment to be installed under Contract, unless otherwise noted.

B. Should the proposed equipment require disassembly for entry through openings, be responsible for disassembling equipment for passage through the openings, and reassembling the equipment for installation at locations as indicated. Be responsible for proper operation and guarantee of

disassembled and reassembled equipment; should equipment not operate properly or become damaged due to disassembly and reassembly, replace equipment at no additional cost to the Owner.

C. Carefully schedule delivery of equipment to project site in accordance with the Schedule of Work.

1.20 SOUND CRITERIA

A. Sound Pressure Levels (dB re MicroPascals) (through each octave band) of rooms shall not exceed the following:

	Frequency Bands (HZ)						
Room	63	125	250	500	1000	2000	4000
Waiting Rooms, Corridors	60	55	50	45	40	35	30

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 CLEANING

A. At the completion of the work all parts of the installation shall be thoroughly cleaned.

3.2 RECORD (AS-BUILT) DRAWINGS

A. The Contractor shall maintain a complete set of Contract Drawings at the site and shall record all deviations in his work (in red ink or pencil) from that indicated on the Contract Drawings. Deviations shall be clearly and accurately recorded so that the Engineer can prepare final record (as-built) drawings using the Contractor's marked-up drawings. Dimensions shall be recorded using permanent reference points such as columns, building walls and like items. Of particular importance are the locations of all interior and exterior underground utilities. These record drawings shall be submitted to the Architect prior to final acceptance.

3.3 WARRANTY

A. The Contractor shall warrant that the materials and workmanship used in the erection of this installation are as herein specified, and he shall provide all labor and materials required to make good any defects in same which become apparent within one year from date of acceptance of completed work providing such defects are due to faulty materials or workmanship and not to

misuse of apparatus by the Owner, his employees, or tenants. Certain equipment shall be warranted or guaranteed for longer than one year from date of final acceptance where specifically mentioned in these specifications.

3.4 CUTTING AND PATCHING

A. Existing Construction

1. All openings in completed new work and in existing walls or ceilings of existing building construction required to install work under Contract shall be cut by this Contractor, except openings in existing exterior walls and existing roofs which shall be cut by the General Contractor. All rough patching made necessary by Contractor's cutting shall be this Contractor's responsibility and shall be performed by workmen skilled in the respective trades. Surfaces of patchwork shall match adjacent existing construction subject to approval of Owner's Representative. Holes required through existing walls shall be cut with a core drill and shall be drilled between ribs, beams or joists. Finish patching will be by General Contractor.
2. Coordinate location of equipment, sleeves and raceways with other contractors.
3. Rough patch all openings in existing construction created by Contractor, caused by removal of existing equipment, and associated materials under Contract, except openings in existing roofs which shall be patched by General Contractor. Finish patching will be by General Contractor.

END OF SECTION 230506

SECTION 230593

TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Balancing Air Systems
   a. Constant-volume air systems

1.2 DEFINITIONS

A. AABC: Associated Air Balance Council.

B. NEBB: National Environmental Balancing Bureau.

C. TAB: Testing, adjusting, and balancing.

D. TABB: Testing, Adjusting, and Balancing Bureau.

E. TAB Specialist: An entity engaged to perform TAB Work.

1.3 REFERENCES

A. AABC - National Standards for Field Measurement and Instrumentation, Total System Balance.

B. ASHRAE – 2011 Applications Handbook: Chapter 38, Testing, Adjusting and Balancing.

C. NEBB – Procedural Standards for testing, Balancing and Adjusting of Environmental Systems.

1.4 SUBMITTALS

A. Strategies and Procedures Plan: Within 30 days of Contractor's Notice to Proceed, submit TAB strategies and step-by-step procedures as specified in "Preparation" Article.

B. Certified TAB reports.

1.5 QUALITY ASSURANCE

A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or NEBB.

1. TAB Field Supervisor: Employee of the TAB contractor and certified by AABC or NEBB.
2. TAB Technician: Employee of the TAB contractor and who is certified by AABC or NEBB as a TAB technician.
3. All field work by the Testing, Adjusting, and Balancing Firm shall be under the direct supervision of a registered Professional Engineer, licensed to practice in the Commonwealth of Pennsylvania and who is a full time employee of the firm.

B. Certify TAB field data reports and perform the following:

1. Review field data reports to validate accuracy of data and to prepare certified TAB reports.
2. Certify that the TAB team complied with the approved TAB plan and the procedures specified and referenced in this Specification.

C. TAB Report Forms: Use standard TAB contractor's forms approved by Architect.

D. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."

1.6 TESTING AND BALANCE REPORT

A. Provide the services of an independent qualified testing, adjusting and balancing firm as approved by the Owner’s Representative. The testing, adjusting and balancing firm shall submit evidence that it has been engaged in this type of service for a minimum of five (5) years and that it has balanced systems of comparable size and complexity as specified for the project.

B. HVAC Contractor and balancing firm are responsible for testing, adjusting and balancing air and water systems and balancing and adjusting existing equipment and systems where this equipment and systems are being altered under this Contract.

C. Coordinate the balancing work with all other Contractors, Temperature Control Subcontractor, Owner’s Representative and the Owner. Temperature Control Subcontractor shall adjust controls. Perform balancing of the heating systems when outdoor air temperature is averaging below 30°F and the cooling systems when outdoor air temperature is above 80°F.

PART 2 - PRODUCTS

NOT USED

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.

B. Examine systems for installed balancing devices, such as test ports, gage cocks, thermometer wells, flow-control devices, balancing valves and fittings, and manual volume dampers. Verify that locations of these balancing devices are accessible.

C. Examine the approved submittals for HVAC systems and equipment.

D. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.

E. Examine ceiling plenums and underfloor air plenums used for supply, return, or relief air to verify that they meet the leakage class of connected ducts as specified in Division 23 Section "Metal Ducts and Nonmetal Ducts" and are properly separated from adjacent areas. Verify that penetrations in plenum walls are sealed and fire-stopped if required.

F. Examine equipment performance data including fan and pump curves.

1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.

G. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.

H. Examine test reports specified in individual system and equipment Sections.

I. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation. Verify that dirty filters have been removed and that new clean filters are in place.

J. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.

K. Examine strainers. Verify that startup screens are replaced by permanent screens with indicated perforations.

L. Examine three-way valves for proper installation for their intended function of diverting or mixing fluid flows.

M. Examine heat-transfer coils for correct piping connections and for clean and straight fins.

N. Examine system pumps to ensure absence of entrained air in the suction piping.

O. Examine operating safety interlocks and controls on HVAC equipment.

P. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

3.2 PREPARATION

A. Prepare a TAB plan that includes strategies and step-by-step procedures.

B. Complete system-readiness checks and prepare reports. Verify the following:

1. Permanent electrical-power wiring is complete.
2. Hydronic systems are filled, clean, and free of air.
3. Automatic temperature-control systems are operational.
4. Equipment and duct access doors are securely closed.
5. Balance, smoke, and fire dampers are open.
6. Isolating and balancing valves are open and control valves are operational.
7. Ceilings are installed in critical areas where air-pattern adjustments are required and access to balancing devices is provided.
8. Windows and doors can be closed so indicated conditions for system operations can be met.

3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

A. Perform testing and balancing procedures on each system according to the procedures contained in SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.

1. Comply with requirements in ASHRAE 62.1-2004, Section 7.2.2, "Air Balancing."

B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.

1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
2. Install and join new insulation that matches removed materials. Restore insulation, coverings, vapor barrier, and finish according to Division 23 Section "HVAC Insulation."

C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.

D. Take and report testing and balancing measurements in inch-pound (IP) units.

3.4 GENERAL PROCEDURES FOR BALANCING AIR SYSTEMS

A. Prepare test reports for all air devices. Crosscheck the summation of required outlet volumes with required fan volumes.

B. Prepare schematic diagrams of systems' "as-built" duct layouts.

C. Check dampers for proper position to achieve desired airflow path.

D. Check for airflow blockages.

3.5 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

A. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.

1. Measure airflow of submain and branch ducts.
   a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.

B. Measure air outlets and inlets without making adjustments.

1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.

C. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.

1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
2. Adjust patterns of adjustable outlets for proper distribution without drafts.

3.6 PROCEDURES FOR EXISTING SYSTEMS

A. Perform testing and balancing of existing systems to the extent that existing systems are affected by the renovation work.

1. Compare the indicated airflow of the renovated work to the measured pre demolition airflows..
2. Balance each air outlet.

3.7 TOLERANCES

A. Set HVAC system's air flow rates and water flow rates within the following tolerances:

1. Air Outlets and Inlets: Plus or minus 10 percent.

3.8 REPORTING

A. Initial Construction-Phase Report: Based on examination of the Contract Documents as specified in "Examination" Article, prepare a report on the adequacy of design for systems' balancing devices. Recommend changes and additions to systems' balancing devices to facilitate proper performance measuring and balancing. Recommend changes and additions to HVAC systems and general construction to allow access for performance measuring and balancing devices.

B. Status Reports: Prepare weekly progress reports to describe completed procedures, procedures in progress, and scheduled procedures. Include a list of deficiencies and problems found in systems being tested and balanced. Prepare a separate report for each system and each building floor for systems serving multiple floors.

3.9 FINAL REPORT

A. General: Prepare and submit four (4) copies of a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.

1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
2. Include a list of instruments used for procedures, along with proof of calibration.

B. Final Report Contents: In addition to certified field-report data, include the following:

1. Field test reports prepared by system and equipment installers.
2. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
    a. Indicated versus final performance.
    b. Notable characteristics of systems.

12. Nomenclature sheets for each item of equipment.
13. Notes to explain why certain final data in the body of reports vary from indicated values.

D. System Diagrams: Include schematic layouts of air distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of supply, return, and exhaust airflows.
2. Duct, outlet, and inlet sizes.
3. Balancing stations.
4. Position of balancing devices.

3.10 ADDITIONAL TESTS

A. Within 90 days of completing TAB, perform additional TAB to verify that balanced conditions are being maintained throughout and to correct unusual conditions.

END OF SECTION 230593

SECTION 260500

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 - GENERAL

1.1 EXECUTION OF THE WORK

A. The scope of work shown on the drawings and in these specifications, Division 26 and 28 are all a part of this contract and shall be included in the base bid unless otherwise noted.

B. These Specifications call out certain duties of the Electrical Contractor and/or Subcontractors. They are not intended as a material list of items required by the Contract.

C. These divisions of the Specifications cover the electrical systems of the project. It includes work performed by the electrical trades as well as trades not normally considered as electrical trades.

D. Provide all items and work indicated on the Drawings and all items and work called for in the Specifications in accordance with the conditions of Contract (Division 1 General Requirements Documents). This includes all incidentals, equipment, appliances, services, hoisting, scaffolding, supports, tools, supervision, labor, consumable items, fees, licenses, etc., necessary to provide complete systems. Perform start-up and checkout on each item and system to verify the systems are fully operable.

E. Comply with all provisions of the Contract Documents including Division 1, General Conditions, and Supplementary General Conditions of the Specifications.

F. Certain terms such as "shall, provide, install, complete, start up" are not used in some parts of these Specifications. This does not indicate that the items shall be less than completely installed or that systems shall be less than complete.

G. Examine and compare the Electrical Drawings and Specifications with the Drawings and Specifications of other trades, and report any discrepancies between them to the Engineer and obtain written instructions for changes necessary in the work. At time of bid the most stringent requirements must be included in said bid. Install and coordinate the electrical work in cooperation with other trades installing interrelated work. Before installation, make proper provisions to avoid interferences in a manner approved by the Engineer. All changes required in the work of the Contractor caused by neglect shall be corrected at the expense of the Contractor.

H. It is the intent of the drawings and specifications to provide a complete workable system ready for the Owner's operation. These specifications are equipment and performance specifications. Items described or called out in the specification but not shown on the drawings are considered to be part of the project. Any item not specifically shown on the drawings or called for in the specifications, but normally required to conform to the intent are to be considered a part of the

contract. Installation of the equipment shall be in accordance with the N.E.C., manufacturer recommendation, and industry standards.

I. All material furnished by the Contractor shall be new and unused (temporary lighting and power products are excluded) and free from defects. All materials used shall bear the Underwriters Laboratory, Inc label provided a standard has been established for the material in question.

J. All products and materials to be new, clean, free of defects and free of damage and corrosion.

K. No exclusion from, or limitation in, the symbolism used on the Drawings for electrical work or the languages used in the Specifications for electrical work shall be interpreted as a reason for omitting accessories necessary to complete any required system or item of equipment.

L. The use of words in the singular shall not be considered as limiting where other indications denote that more than one item is referred to.

M. Except for conduit, conduit fittings, outlet boxes, wire and cable, all items of equipment or material shall be the product of one manufacturer throughout. Multiple manufacturers will not be permitted.

1.2 COORDINATION OF THE WORK

A. Certain materials will be provided by other trades. Examine the Contract Documents to ascertain these requirements.

B. Carefully check space requirements with other trades and the physical confines of the area to ensure that all material can be installed in the spaces allotted thereto including finished suspended ceilings. Make modifications thereto as required and approved.

C. Transmit to other trades all information required for work to be provided under their respective sections in ample time for installation.

D. Wherever work interconnects with work of other trades, coordinate with other trades to ensure that all trades have the information necessary so that they may properly install all the necessary connections and equipment. Identify all items of work that require access so that the ceiling trade will know where to install access doors and panels.

E. The locations of lighting fixtures, outlets, panels and other equipment indicated on the Drawings are approximately correct, but they are understood to be subject to such revision as may be found necessary or desirable at the time the work is installed in consequence of increase or reduction of the number of outlets, or in order to meet field conditions or to coordinate with modular requirements of ceilings, or to simplify the work, or for other legitimate causes.

F. Exercise particular caution with reference to the location of panels, outlets, switches, etc., and have precise and definite locations approved by the Engineer before proceeding with the installation.

G. The Drawings show only the general run of raceways and approximate location of outlets. Any significant changes in location of outlets, cabinets, etc., necessary in order to meet field conditions shall be brought to the immediate attention of the Engineer and shall receive approval before such alterations are made. All such modifications shall be made without additional cost to the Owner.

H. Obtain from the Engineer in the field the location of such outlets or equipment not definitively located on the Drawings.

I. Circuit "tags" in the form of arrows are used where shown to indicate the home runs of raceways to electrical distribution points. These tags show the circuits in each home run and the panel designation. Show the actual circuit numbers on the finished record tracing and on panel directory card. Where circuiting is not indicated, the Electrical Contractor must provide required circuiting in accordance with the loading indicated on the drawings and/or as directed.

J. The Drawings generally do not indicate the exact number wires in each conduit for the branch circuit wiring of fixtures, and outlets, or the actual circuiting. Provide the correct wire size and quantity as required by the indicated circuiting and/or circuit numbers indicated and control wiring diagrams, if any, specified voltage drop or maximum distance limitations, and the applicable requirements of the NEC.

K. Adjust locations of conduits, panels, equipment, pull boxes, fixtures, etc. to accommodate the work to prevent interferences, both anticipated and encountered. Determine the exact route and location of each raceway prior to installation.

1. Right of way: lines which pitch to have the right-of-way over those which do not pitch. For example: steam, condensate, and plumbing drains normally have right-of-way. Lines whose elevations cannot be changed to have right-of-way over lines whose elevations can be changed.
2. Make offsets, transitions and changes in direction in raceways and as required to maintain proper head room in pitch of sloping lines whether or not indicated on the Drawings.

L. Contractor shall furnish services of experienced Superintendent, who shall be in constant charge of all work, and who shall coordinate his work with the work of other trades. No work shall be installed before coordinating with other trades.

1.3 EXAMINATION OF SITE

A. Prior to submitting of bids, the Contractor shall visit the site of the job and shall familiarize himself with all conditions affecting the proposed installation and shall make provisions as to the cost thereof. Failure to comply with the intent of this paragraph will in no way relieve the Contractor of performing all necessary work shown on the Drawings.

1.4 PROGRESS OF WORK

A. The Contractor shall order the progress of his work so as to conform to the progress of the work of other trades and shall complete the entire installation as soon as the conditions of the building will permit. Any cost resulting from the defective or ill-timed work performed under this section shall be borne by the Contractor.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship and store all products and materials in a manner which will protect them from damage, weather and entry of debris. If items are damaged, do not install, but take immediate steps to obtain replacement or repair. Any such repairs shall be subject to review and acceptance of the Engineer.

B. Delivery of Materials: Deliver materials (except bulk materials) in manufacturer's unopened container fully identified with manufacturer's name, trade name, type, class, grade, size and color.

C. Storage of Materials, Equipment and Fixtures: Store materials suitably sheltered from the elements, but readily accessible for inspection by the Engineer until installed. Store all items subject to moisture damage in dry, heated spaces.

1.6 EQUIPMENT ACCESSORIES

A. Provide supports, hangers and auxiliary structural members required for support of the work.

B. Furnish and set all sleeves for passage of raceways through structural, masonry and concrete walls and floors and elsewhere as will be required for the proper protection of each raceway and passing through building surfaces.

C. Wall mounted equipment, total weight of 100 pounds or less, may be directly secured to wall by means of steel bolts. Maintain at least 1" air space between equipment and supporting wall. Groups or arrays of equipment, with total weight of more than 100 pounds, shall be mounted on adequately free standing sized steel angles, channels, or bars. Prefabricated steel channels providing a high degree of mounting flexibility, such as those manufactured by Kindorf, Globe-Strutt and Unistrut, may be used for mounting arrays of equipment.

1.7 CUTTING, PATCHING, ETC.

A. The work shall be carefully laid out in advance. Where Cutting, channeling, chasing or drilling of floors, walls, partitions, ceilings or other surfaces is necessary for the proper installation, support or anchorage of raceway, outlets or other equipment, the work shall be carefully done. Any damage to the building, piping, equipment or defaced finish plaster, woodwork, metalwork, etc. shall be repaired by skilled mechanics of the trades involved at no additional cost to the Owner.

B. The Contractor shall do no cutting, channeling, chasing or drilling of unfinished masonry, tile, etc., unless he first obtains permission from the Engineer. If permission is granted, the Contractor shall perform this work in a manner approved by the Engineer.

C. Where conduits, outlet, junction, or pullboxes are mounted on a painted surface, or a surface to be painted, they shall be painted to match the surface. Whenever support channels are cut, the bare metal shall be cold galvanized.

D. Slots, chases, openings and recesses through floors, walls, ceilings, and roofs will be provided by the various trades in their respective materials. The trade requiring them to properly locate such openings and be responsible for any cutting and patching caused by the neglect to do so.

1.8 MOUNTING HEIGHTS

A. Unless otherwise noted, mounting heights for equipment and wiring devices shall be as shown as noted on the drawings.

1.9 CLEANING UP

A. Contractor shall take care to avoid accumulation of debris, boxes, crates, etc. resulting from the installation of work. Contractor shall remove from the premises each day all debris, boxes, etc., and keep the premises clean, subject to the Architect's instructions, which shall be promptly carried out.

B. Contractor shall clean all fixtures and equipment at the completion of the project.

1.10 PRODUCTS

A. If products and materials are specified or indicated on the drawings for a specific item or system, use those products or materials. Where noted in other sections of this specification, equipment has been specified for a specific performance and substitutions are not permitted. If products and materials are not listed in either of the above, use first class products and materials, subject to approval of Shop Drawings where Shop Drawings are required or as approved in writing where Shop Drawings are not required.

1.11 OMISSIONS FROM THE DRAWINGS

A. Should a Bidder find discrepancies in or omissions from the drawings or specifications or be in doubt as to their meaning, he shall notify the Architect before submitting his proposal. The Architect will in turn, send written instructions to all Bidders. Neither the Architect nor the Owner will be responsible for oral instructions. If the Contractor fails to comply with this requirement, he shall accept the Engineer's interpretations as to the intended meaning of the drawings and specifications.

1.12 EXECUTION

A. Follow manufacturer's instructions for installing, connecting, and adjusting all equipment. Provide one copy of such instructions to the Architect before installing any equipment. Provide a copy of such instructions at the equipment during any work on the equipment. Provide all special supports, connections, wiring, accessories, etc.

B. Use mechanics skilled in their trade for all work.

C. Clean all items before and after installation. Clean up all debris.

D. Perform all tests required by local authorities in addition to tests specified herein, such as life safety systems.

E. Applicable equipment and materials to be listed by Underwriters' Laboratories and manufactured in accordance with ASME, NEMA, ANSI or IEEE standards and as approved by local authorities having jurisdiction.

F. Before commencing work, examine all adjoining, underlying, etc., work on which this work is in any way dependent for perfect workmanship and report any condition which prevents performance of first class work. Become thoroughly familiar with actual existing conditions to which connections must be made or which must be changed or altered.

1.13 VERIFICATION OF ELECTRICAL REQUIREMENTS FOR EQUIPMENT FURNISHED BY OTHERS

A. Prior to the installation of wiring systems for any equipment furnished by others, this contractor shall verify that the electrical requirements of the equipment match those shown on the electrical drawings by examining the approved shop drawings of that equipment. Any discrepancies shall be immediately reported to the engineer.

B. If the contractor fails to comply with this requirement, he shall be responsible for any additional costs incurred at no additional cost to the Owner.

1.14 PROTECTION OF BUILDING FIRE/SMOKE BARRIERS

A. Passages of conduit through fire barriers and/or smoke barriers shall be protected as follows:

1. The space between the penetrating item and the fire barrier and/or smoke barrier shall be filled with a material capable of maintaining the fire/smoke resistance of the barrier or be protected by an approved device designed for the specific purpose.
2. Where the penetrating item uses a sleeve to penetrate the fire and/or smoke barrier the sleeve shall be solidly set in the fire/smoke barrier and the space between the item and the sleeve shall be filled as described above.
3. Fire barriers shall include 1-hour, 2-hour, and 3-hour rated floors and walls. Refer to architectural plans for location of fire barriers and smoke barriers and provide protection required to maintain ratings in accordance with all codes.
4. Approved fill material for fire barriers shall be packed mineral wool, with ASTME-136 rating and 3M Fire Barrier caulk. Coordinate sealing of all openings with requirements of Division 7 of this specification.
5. Perform work in accordance with the appropriate UL Ratings.
6. Product Data: Provide manufacturer's specifications, recommendations and installation instructions for each application.

1.15 CODES AND FEES

A. General: Comply with Codes in accordance with the Contract Documents.

B. The electrical installation shall be in compliance with the requirements of OSHA, NEC and the rules, regulations and requirements of the power company supplying power to the building.

C. The electrical installation shall comply fully with all township, county and state laws, ordinances and regulations applicable with electrical installations.

D. All equipment shall be equal to or exceed the minimum requirements of NEMA, IEEE and UL.

E. Should any change in Drawings or Specifications be required to comply with governmental regulations, the Contractor shall notify Architects prior to execution of the work. The work shall be carried out according to the requirements of such code in accordance with the instruction of the Architect and at no additional cost to the Owner.

F. The local fees and permits and services of inspection authorities shall be obtained and paid for by the Contractor. The Contractor shall cooperate fully with local utility companies with respect to their services.

G. Certificate of Inspection and approval shall be procured and paid for by this Contractor from an approved certified inspection agency.

1.16 GUARANTEE

A. General: Provide a Guarantee in accordance with the Contract Documents.

B. Submit a single guarantee stating that all portions of the work are in accordance with Contract requirements. Guarantee all work against faulty and improper material and workmanship for a period of one (1) year from date of final acceptance by the Owner, except that where guarantees or warranties for longer terms are specified herein, such longer term to apply. Within 24 hours after notification, correct any deficiencies which occur during the guarantee period at no additional cost to Owner, all to the satisfaction of the Owner and Architect. Obtain similar guarantees from subcontractors, manufacturers, suppliers and subtrade specialists.

1.17 DISPOSAL

A. All electrical items not designated by the Owner for his use to be properly disposed of according to local, state and Federal regulations.

B. Items containing polychlorinated biphenyl (PCB) to be removed, transported and disposed of according to Federal Toxic Substances Control Act (TSCA). Contractor to submit certification that these items have been properly disposed.

END OF SECTION 260500

SECTION 260519

LOW VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. General: Provide 600 volt wire and cable in accordance with the Contract Documents.

1.3 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:

1. Underwriters Laboratory Standard No. UL 467
   a. ASTM
   b. IPECA
2. Terminal Blocks
   a. UL-1059

PART 2 - PRODUCTS

2.1 WIRE AND CABLE

A. General

1. Provide wire with a minimum insulating rating of 600 volts, except for wire used in 50 volts or below applications for control of signal systems use 300 volt minimum or 600 volt where permitted to be incorporated with other wiring systems.

B. Conductor

1. Electrical grade, annealed copper fabricated in accordance with ASTM standards. Minimum size number 12 for branch circuits; number 14 for control wiring.
2. The conductors shown on the drawings are copper, except as noted otherwise.

C. Stranding and Number of Conductors

1. Number 12 and number 10 solid.
2. Cables larger than number 10, stranded in accordance with ASTM Class B stranding designations.
3. Control wires stranded in accordance with ASTM Class B stranding designations.
4. Cables, multi-conductor unless otherwise noted for low tension systems.

D. Insulation

1. Type THWN/THHN insulation suitable for use in wet locations up to 75 degrees Centigrade. Use for lighting, receptacle and motor circuits and for panel and equipment feeders.

2.2 CONNECTORS

A. Make connections, splices, taps and joints with solderless devices, mechanically and electrically secure. Protect exposed wires and connecting devices with electrical tape or insulation to provide not less than that of the conductor.

B. Branch Circuit wires (Number 10 and smaller): Use any of the following types of terminals and connecting devices:

1. Hand Applied
   a. Coiled tapered, spring wound devices with a conducting corrosion-resistant coating over the spring steel and a plastic cover and skirt providing full insulation for splice and wired ends. Screw connector on by hand.
2. Tool Applied
   a. Steel cap, with conduction and corrosion resistant metallic plating, open at both ends, fitted around the twisted ends of the wire and compressed or crimped by means of a special die designed for the purpose. Specifically fitted plastic or rubber insulating cover wrap over each connector.

2.3 ELECTRICAL TAPE

A. Specifically designed for use as insulating tape.

2.4 LUBRICANT

A. Use lubricant only where the possibility of damage to conductors exists. Use only a lubricant approved by the cable manufacturer and one which is inert to cable and raceways.

PART 3 - EXECUTION

3.1 WIRE AND CABLE

A. Provide a complete system of conductors in raceway system. Mount wiring through a specified raceway, regardless of voltage application.

B. Drawings do not indicate size of branch circuit wiring. For branch circuits whose length from panel to furthest outlet exceeds 100 feet for 120-volt circuits, use number 10 or larger.

C. Do not install wire in incomplete conduit runs nor until after the concrete work and plastering is completed and moisture is swabbed from conduits. Eliminate splices wherever possible. Where necessary, splice in readily accessible pull, junction, or outlet.

D. Provide cable supports for all vertical risers where required by code.

E. Use terminating fittings, connectors, etc., of a type suitable for the specified cable furnished. Make bends in cable at termination prior to installing compression device. Make fittings tight.

F. Extend wire sizing for the entire length of a circuit, feeder, etc. unless specifically noted otherwise.

G. Provide a separate neutral conductor for each branch circuit. In the event a common neutral conductor is used, such as in furniture systems, the circuit breaker in the panelboard must be common trip for each phase that uses one neutral conductor.

END OF SECTION 260519

SECTION 260529

HANGERS AND SUPPORTS FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 SUMMARY

A. Equipment shall be installed on hangers and supports as specified in this section of the specifications.

1.3 SUPPORTS

A. Support work in accordance with the best industry practice and the following.

B. Include supporting frames or racks extending from floor slab to ceiling slab for work indicated as being supported from walls where the walls are incapable of supporting the weight. In particular, provide such frames or racks in electric closets.

C. Nothing, (including outlet, pull and junction boxes and fittings) shall depend on electric conduits, raceways, or cables for support, except that threaded hub type fittings having a gross volume not in excess of 100 cubic inches may be supported from heavy wall conduit, where the conduit in turn is securely supported from the structure within five inches of the fitting on two opposite sides.

D. Nothing shall rest on, or depend for support on, suspended ceilings media (tiles, lath, plaster, as well as splines, runners, bars and the like in the plane of the ceiling).

E. Provide required supports and hangers for conduit, equipment, etc., so that loading will not exceed allowable loadings of structure.

1.4 FASTENINGS

A. Fasten electric work to building structure in accordance with the best industry practice and the following:

B. As a minimum procedure, where weight applied to the attachment points is 100 pounds or less, fasten to building elements of:

1. Wood – with wood screws.
2. Concrete and solid masonry – with bolts and expansion shields.
3. Hollow Construction – with toggle bolts.
4. Solid metal – with machine screws in tapped holes or with welded studs.
5. Steel decking or subfloor – with fastenings as specified below for applied weights in excess of 100 pounds.

END OF SECTION 260529

SECTION 260533

RACEWAYS AND BOXES FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 DESCRIPTION

A. General: Provide raceways in accordance with the Contract Documents.

1.2 STANDARDS

A. Except as modified by governing codes and by the Contract Documents, comply with the latest applicable provisions and latest recommendations of the following:
   1. Electrical Metallic Tubing – EMT
      a. UL Standard UL-797
      b. ANSI C80-3
      c. Federal Specification WW-C-563
   2. Flexible Metal Conduit – FMC
      a. UL Standard UL-1
   3. Metal Clad Cable – MC
      a. UL Standard 1581
      b. Federal Spec J-C-30B

PART 2 - PRODUCTS

2.1 RACEWAY TYPES

A. Electric Metallic Tubing – EMT

   1. Continuous, seamless tubing galvanized or sheradized on the exterior coated on the interior with a smooth hard finish of lacquer, varnish or enamel.
   2. All couplings, connectors, etc., used in conjunction with this raceway which are 2 inch in size and smaller shall be watertight compression type. EMT fittings shall be malleable iron zinc coated. With conduits of 2-1/2 inch in size and larger, set screw type couplings are permitted.

B. Flexible Metal Conduit – FMC

   1. Single strip, continuous, flexible interlocked double-wrapped steel, galvanized inside and outside forming smooth internal wiring channel.
   2. Maximum length: 6 feet.
   3. Each section of raceway must contain a bonding wire bonded at each end and sized as required. Provide connectors with insulating bushings.

C. Metal Clad Cable – MC

Non Health Care

1. Type MC cable shall be armored galvanized steel sheath cable with copper conductors and THHN 90 º insulation. Furnish with insulated grounding conductor.

2.2 OUTLET, JUNCTION AND PULLBOXES

A. Provide zinc-coated or cadmium-plated sheet steel outlet boxes not less than 4 inches octagonal or square, unless otherwise noted. Equip fixture outlet boxes with 3/8 inch no-bolt fixture studs where required. Where fixtures are mounted on or in an accessible type ceiling, provide a junction box and extend flexible conduit to each fixture. Fit outlet boxes in finished ceilings or walls with appropriate covers, set flush with the finished surface. Where more than one switch or device is located at one point, use gang boxes and covers unless otherwise indicated. Sectional switch boxes or utility boxes will not be permitted. Provide Series "GW" (Steel City) tile box, or as accepted, or a 4 inch square box with tile ring in masonry walls which will not be plastered or furred. Where drywall material is utilized, provide plaster ring. Provide outlet boxes of the type and size suitable for the specific application. Where outlet boxes contain two or more 277 volt devices, or where devices occur of different applied voltages, or where normal and emergency devices occur in same box, provide suitable barrier.

B. Construct junction or pullboxes not over 150 cubic inches in size as standard outlet boxes, and those over 150 cubic inches the same as "cabinets" with screw covers of the same gauge metal.

C. Plug any open knockouts not utilized.

D. Provide surface mounted outlet and junction boxes in indoor locations where exposed to moisture and outdoor locations of cast metal with threaded hubs.

PART 3 - EXECUTION

3.1 APPLICATION OF RACEWAYS

A. The following applications must be adhered to except as otherwise required by Code. Raceway not conforming to this listing must be removed by this Contractor and replaced with the specified material at this Contractor's expense.

B.

Raceway Types	Application
Electrical Metallic Tubing EMT	Use in every instance except where another material is specified.
Flexible Metal Conduit – FMC	Use in dry areas for connections to lighting fixtures in hung ceilings, connections to equipment installed in removable panels of hung ceilings at all transformer or equipment raceway connections where sound and vibration isolation is required.

Metal-Clad Cable - MC	Use for branch circuit wiring above suspended ceilings or in metal stud walls. Cable shall not be run exposed. Home run wiring from panelboard to first outlet box shall be installed in conduit. MC cable not permitted for fire alarm wiring systems or emergency lighting.

3.2 RACEWAY SYSTEMS IN GENERAL

A. Provide raceways for all wiring systems unless noted otherwise. Minimum size 3/4 inch for home runs and 1 inch minimum for power distribution. Wiring of each type and system must be installed in separate raceways.

B. Locate raceways so that the strength of structural members is unaffected and they do not conflict with the services of other trades. Install 1 inch or larger raceways in or through structural members (beams, slabs, etc.) only when and in the manner accepted by the Architect. Draw up couplings and fittings full and tight. Protect threads from corrosion with one coat zinc chromate after installation.

C. Above Grade – Defined as the area above finished grade for a building exterior and above top surface of any slabs (or other concrete work) on grade for a building interior. Above-grade raceways to comply with the following:

1. Install raceways concealed except at surface cabinets and for motor and equipment connection in electrical and mechanical rooms. Install a minimum of 6 inches from flues, steam pipes, or other heated lines. Route raceways parallel or perpendicular to building lines with right-angle turns and symmetrical bends. Run embedded raceways in a direct line and, where possible, with long sweep bends and offsets. Provide sleeves in forms for new concrete walls, floor slabs and partitions for passage of raceways. Waterproof sleeved raceways where required.
2. Provide raceway expansion joints for exposed and concealed raceways with necessary bonding conductor at building expansion joints and between buildings or structures and where required to compensate for raceway or building thermal expansion and contraction.

D. Raceways in hung ceilings shall be run on and secured to slab or primary structural members of ceiling, not to lathing channels or T-bars or other elements which are the direct supports of the ceiling panels. Secure conduit firmly to steel by clips and fittings designed for that purpose. Install as high as possible, but not less than, 1-0" above hung ceilings.

E. Exposed raceways shall be run parallel or at right angles with building lines. Secure raceway clamps or supports to masonry materials by toggle bolts, expansion bolts, or steel inserts. Install raceway on steel construction with approved clamps which do not depend on friction or set-screw pressure alone.

F. Clear raceway of all obstructions and dirt prior to pulling in wires or cables. This shall be done with ball mandrel (diameter approximately 85% of conduit inside diameter) followed by close fitting wire brush and wad of felt or similar material. This assembly may be pulled in together with, but ahead of the cable being installed. All empty raceways shall be similarly cleaned. Clear any raceway which rejects ball mandrel.

G. Support less than 1 inch trade size horizontally run, raceways at intervals not greater than 7 feet. Support such raceways, 1 inch trade size or larger, at intervals no greater than 10 feet.

3.3 OUTLET, JUNCTION, AND PULLBOXES

A. Provide outlet, junction, and pullboxes as indicated on the Drawings and as required for the complete installation of the various electrical systems, and to facilitate proper pulling of wires and cables. J-boxes and pullboxes shall be sized per NEC minimum.

B. The exact location of outlets and equipment is governed by structural conditions and obstructions or other equipment items. When necessary, relocate outlets so that when fixtures or equipment are installed, they will be symmetrically located according to the room layout and will not interfere with other work or equipment. Verify final location of outlets, panels equipment, etc., with Architect.

C. Back-to-back outlets in the same wall or "thru-wall" type boxes are not permitted. Provide 12 inch (minimum) spacing for outlets shown on opposite sides of a common wall to minimize sound transmission.

END OF SECTION 260533

SECTION 265100

INTERIOR LIGHTING

PART 1 - GENERAL

1.1 DESCRIPTION

A. Section includes, but is not necessarily limited to, the furnishing and installation of all lighting as indicated on the Drawings, as specified herein, and as necessary for the proper and complete performance of the work.

B. Major items:

1. Interior lighting fixtures
2. Emergency lighting
3. Exit lighting
4. Adequate fixture support systems.

1.2 STANDARDS

A. Except as herein specified or as indicated on the Drawings, the work of this Section shall comply with the following:
1. NFPA
a. 70 – NEC
b. 101 – Life Safety

1.3 FIXTURE SCHEDULE

A. No substitutions will be accepted after bids are received. The lighting equipment specified herein has been carefully chosen for its ability to meet luminous performance requirements of this project. Substitutions in all likelihood will be unable to meet all of the same criteria as specified equipment. No exceptions.

B. When only one manufacturer is listed within the description of the luminaire, the design engineering of architectural aesthetics will not allow substitution of another manufacturer. The contractor shall provide a separate list of unit costs for these luminaires with shop drawings. Shop drawings will not be reviewed without unit cost information.

C. When one or more manufacturers and the words "or equivalent" appear within the fixture description, the Contractor may elect to submit to Engineer a substitute fixture for review. All submittals must be made within 14 days prior to the bid date to provide ample time for review and to issue an addendum incorporating the substitution.

D. Substitution submittals shall consist of a physical description, dimensioned drawing and complete photometric and electric data of the proposed lamp and luminare. Working samples of lamp and luminaire substitutions must also be supplied for visual check of finish and operating characteristics. Photometric reports must list the actual candela values for the luminaire's distribution in at least three planes. Candela curves, footcandle and lumen tables and iso-footcandle contours are not acceptable. No substitutions will be considered without compliance with the paragraph. Contractor will be responsible for all cost, (engineering time, manufacturer's costs, distributor costs) incurred to replace equipment not approved if substitutions are made by the distributor, manufacturers representative, or subcontractor.

E. Once Bids, Shop Drawings are approved, all lighting is to be ordered in a timely manner. The Contractor is then to inform the Engineer immediately, in writing, the date when equipment orders are completed and delivery scheduled.

1.4 SUBMITTALS

A. Submit shop drawings and manufacturers' data for the following items in accordance with the conditions of the contract and as specified below.

1. Major luminaires and special luminaires shall show full size cross sections. Indicate finished dimensions, metal thicknesses, and materials.
2. Show mounting details, including hung ceiling construction.
3. Shop drawings shall include a complete listing of all luminaires on a single sheet. This listing shall contain the luminaire type, manufacturer's catalog number, applied voltage, lamps and ballasts.
4. Submit manufacturer's fixtures and accessories Shop Drawings and data in booklet form, including rough-in dimensions, instructions for installation and maintenance.

1.5 PROTECTION

A. Protect lighting fixtures and work against dirt, water or mechanical damage before, during, and after installation. Damage to fixtures prior to final acceptance shall be repaired or replaced at no cost to the Owner.

PART 2 - PRODUCTS

2.1 MATERIALS AND FIXTURES

A. General

1. Provide all lighting fixtures in accordance with Lighting Fixture Schedule and as indicated and required on Drawings.
2. Fixture catalog numbers only indicates type and style. Provide each fixture complete with proper fixture trim, levelers, mounting brackets, flanges, plaster rings, glassware and accessories for complete installation as required for type of ceiling and room finish schedules.

3. Provide gaskets as required to prevent light spill between frames and ceilings.
4. Provide continuity of ground on all fixtures used as raceways and mounted end to end.
5. All metal parts to be chemically treated with a rust resistant phosphatized solution, reflecting surfaces to have a factor of minimum 90%.
6. Provide luminaires, completely factory-assembled and wired and equipped with necessary sockets, ballasts, wiring, shielding, reflectors, channels, lenses, etc., and deliver to job ready for installation.
7. Luminaire Wiring: Minimum individual luminaire wiring – number 18 gauge with insulation with rated operating temperature of 105 degrees Centigrade or higher. Terminate wiring for recessed luminaires, except fluorescent units, in an external splice box.
8. Recessed luminaires shall be furnished with thermal protection in accordance with Article 410-65 of the NEC.
9. Where utilized as raceway, luminaires shall be suitable for use as raceways. Provide feed through splice boxes where necessary. Wiring shall be rated for 90 degrees Centigrade.

B. Exit Lighting

1. Exit lighting system shall be as indicated on Drawings.
2. Equipment shall be complete with lamps.
3. Where indicated as such, provide battery pack and charger for illumination under power failure conditions.
4. Equipment shall meet BOCA, OSHA, NFPA and NEC illumination standards.

2.2 LIGHTING FIXTURE SUPPORT COMPONENTS

A. Comply with Division 26 Section "Hangers and Supports for Electrical Systems" for channel and angle-iron supports and nonmetallic channel and angle supports.

PART 3 - EXECUTION

3.1 INSPECTION AND PREPARATION

A. General
1. Install outlets, surface mounted, recessed or semi-recessed fixtures to maintain the alignment, spacings, layout and general arrangements indicated in the Drawings. Obtain approval of Engineer for all changes in layout required to avoid interferences with other trades.

B. Coordination

1. Work incorporating with ceiling trades in locating and framing recessed fixtures in acoustical tile pattern or grid system to conform to layout.
2. Inform affected trades of the location and framing details necessary for the installation of flush fixtures and deliver all framing rings of these fixtures that become a part of the ceiling construction.

3. Before equipment is ordered, electrical contractor to review luminaire and ceiling mechanical compatibility in each area and verify luminaire on the drawings. Contractor shall be responsible for all fixture quantities, lengths and clearances required and shall inform the ARCHITECT of the job conditions at variance with the fixture(s) specified or detailed which affect installation or location. (All stages of installation.)
4. Mechanical and electrical contractors are to review and coordinate lighting locations in relationship to mechanical systems to minimize conflicts prior to installation. Electrical contractor is to submit a written memo with minutes of these meetings to both the Architect and Engineer.
5. This contractor is responsible for coordinating the characteristics and the U.L. labeling of the luminaires and their components with the ambient conditions, which will exist when the luminaires are installed. No extra compensation will be permitted for failure to coordinate the luminaires with their ambient conditions.

C. Mounting and Supports
1. Where luminaires are mounted on surface-mounted outlet boxes in surface mounted conduit runs, this Contractor shall furnish and install a luminaire canopy sufficiently deep to permit exposed conduits to pass through. Canopy shall have proper openings cut by luminaire manufacturer through which conduits may pass. Submit sample of canopy for approval before installation.
2. Prior to final payment, this contractor shall clean all luminaires and replace all lamps. He shall also touch up all scratch marks, etc. in an approved manner.
3. Recessed luminaires to be installed in metal panel or acoustic modular ceilings shall be modified as required to fit into openings in ceiling construction. This contractor shall coordinate and verify this work with the General Construction Contractor. Shop Drawings showing details shall be submitted for approval.
4. All luminaires in hung ceilings are to be installed with earthquake clips.

3.2 ADJUSTING AND CLEANING

A. At project completion, before final approval:

1. Aim adjustable fixtures as directed and observe and adjust at night as required.
2. Clean interior of all fixtures, all lenses and lamps.

END OF SECTION 265100

SECTION 281300

ACCESS CONTROL

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes a security access system consisting of field-installed Controllers connected by a high-speed electronic data transmission network. The security access system shall have the following:

1. Access Control:

a. Regulating access through doors.
b. Anti-passback.
c. Visitor assignment.
d. Credential cards and readers.
e. Monitoring of field-installed devices.
f. Reporting.

1.2 SYSTEM DESCRIPTION

A. System shall consist of connections to existing Central Station, and field-installed Controllers, connected by a high-speed electronic data transmission network.

B. Network(s) connecting PCs and Controllers shall consist of one or more of the following:

1. Local area, IEEE 802.3 Fast Ethernet 10 BASE-T star topology network based on TCP/IP.

C. System Network Requirements:

1. Interconnect system components and provide automatic communication of status changes, commands, field-initiated interrupts, and other communications required for proper system operation.
2. Communication shall not require operator initiation or response, and shall return to normal after partial or total network interruption such as power loss or transient upset.
3. System shall automatically annunciate communication failures to the operator and identify the communication link that has experienced a partial or total failure.
4. Communications Controller may be used as an interface between the Central Station display systems and the field device network. Communications Controller shall provide functions required to attain the specified network communications performance.

D. Field equipment shall include Controllers, sensors, and controls. Controllers shall serve as an interface between the Central Station and sensors and controls. Data exchange between the Central Station and the Controllers shall include down-line transmission of commands,

software, and databases to Controllers. The up-line data exchange from the Controller to the Central Station shall include status data such as intrusion alarms, status reports, and entry-control records. Controllers are classified as alarm-annunciation or entry-control type.

E. Error Detection: A cyclic code error detection method shall be used between Controllers and the existing Central Station, which shall detect single- and double-bit errors, burst errors of eight bits or less, and at least 99 percent of all other multibit and burst error conditions. Interactive or product error detection codes alone will not be acceptable.

F. Door Hardware Interface: Coordinate with Division 08 Sections that specify door hardware required to be monitored or controlled by the security access system. The Controllers in this Section shall have electrical characteristics that match the signal and power requirements of door hardware. Integrate door hardware specified in Division 08 Sections to function with the controls and PC-based software and hardware in this Section.

1.3 SUBMITTALS

A. Product Data: For each type of product indicated. Include operating characteristics, furnished specialties, and accessories. Reference each product to a location on Drawings. Test and evaluation data presented in Product Data shall comply with SIA BIO-01.

B. Shop Drawings:

1. Diagrams for cable management system.
2. System labeling schedules, including electronic copy of labeling schedules that are part of the cable and asset identification system of the software specified in Parts 2 and 3.
3. Wiring Diagrams. Show typical wiring schematics including the following:

    a. Outlets, jacks, and jack assemblies.

C. Project planning documents as specified in Part 3.

D. Field quality-control test reports.

1. Operation and maintenance data.

1.4 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NFPA 70, "National Electrical Code."

C. Comply with SIA DC-01 and SIA DC-03.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with existing system requirements and manufacturer.

B. Controller Software:

1. Controllers shall operate as an autonomous intelligent processing unit. Controllers shall make decisions about access control, alarm monitoring, linking functions, and door locking schedules for its operation, independent of other system components. Controllers shall be part of a fully distributed processing control network. The portion of the database associated with a Controller and consisting of parameters, constraints, and the latest value or status of points connected to that Controller, shall be maintained in the Controller.
2. Functions: The following functions shall be fully implemented and operational within each Controller:

    a. Monitoring inputs.
    b. Controlling outputs.
    c. Automatically reporting alarms to the existing Central Station.
    d. Reporting of sensor and output status to existing Central Station on request.
    e. Maintaining real time, automatically updated by the existing Central Station at least once a day.
    f. Communicating with the existing Central Station.
    g. Executing Controller resident programs.
    h. Diagnosing.
    i. Downloading and uploading data to and from the existing Central Station.

3. Controller Operations at a Location:

    a. Location: Up to 64 Controllers connected to RS-485 communications loop. Globally operating I/O linking and anti-passback functions between Controllers within the same Location without central-station intervention. Linking and anti-passback shall remain fully functional within the same Location even when the Central Station is off line.
    b. In the event of communications failure between the Central Station and a Location, there shall be no degradation in operations at the Controllers at that Location. The Controllers at each Location shall be connected to a memory buffer with a capacity to store up to 10,000 events; there shall be no loss of transactions in system history files until the buffer overflows.
    c. Buffered events shall be handled in a first-in-first-out mode of operation.

4. Individual Controller Operation:

    a. Controllers shall transmit alarms, status changes, and other data to the Central Station when communications circuits are operable. If communications are not available, Controllers shall function in a stand-alone mode and operational data, including the status and alarm data normally transmitted to the Central Station,

shall be stored for later transmission to the Central Station. Storage capacity for the latest 1024 events shall be provided at each Controller.

b. Card-reader ports of a Controller shall be custom configurable for at least 120 different card-reader or keypad formats. Multiple reader or keypad formats may be used simultaneously at different Controllers or within the same Controller.

c. Controllers shall provide a response to card-readers or keypad entries in less than 0.25 seconds, regardless of system size.

d. Controllers that are reset, or powered up from a nonpowered state, shall automatically request a parameter download and reboot to its proper working state. This shall happen without any operator intervention.

e. Initial Startup: When Controllers are brought on-line, database parameters shall be automatically downloaded to them. After initial download is completed, only database changes shall be downloaded to each Controller.

f. Failure Mode: On failure for any reason, Controllers shall perform an orderly shutdown and force Controller outputs to a predetermined failure mode state, consistent with the failure modes shown and the associated control device.

g. Startup After Power Failure: After power is restored, startup software shall initiate self-test diagnostic routines, after which Controllers shall resume normal operation.

h. Startup After Controller Failure: On failure, if the database and application software are no longer resident, Controllers shall not restart, but shall remain in the failure mode until repaired. If database and application programs are resident, Controllers shall immediately resume operation. If not, software shall be restored automatically from the Central Station.

5. Communications Monitoring:

a. System shall monitor and report status of RS-485 communications loop of each Location.

b. Communication status window shall display which Controllers are currently communicating, a total count of missed polls since midnight, and which Controller last missed a poll.

c. Communication status window shall show the type of CPU, the type of I/O board, and the amount of RAM memory for each Controller.

6. Operating systems shall include a real-time clock function that maintains seconds, minutes, hours, day, date, and month. The real-time clock shall be automatically synchronized with the Central Station at least once a day to plus or minus 10 seconds. The time synchronization shall be automatic, without operator action and without requiring system shutdown.

C. PC-to-Controller Communications:

1. Central-station communications shall use the following:

a. Direct connection using serial ports of the PC.

b. TCP/IP LAN network interface cards.

2. Serial Port Configuration: Each serial port used for communications shall be individually configurable for "direct communications," "modem communications incoming and outgoing," or "modem communications incoming only"; or as an ASCII output port.

3. Multiport Communications Board: Use if more than two serial ports are needed.

    a. Expandable and modular design. Use a 4-, 8-, or 16-serial port configuration that is expandable to 32 or 64 serial ports.
    b. Connect the first board to an internal PCI bus adapter card.

4. Direct serial, TCP/IP, and dial-up communications shall be alike in the monitoring or control of system, except for the connection that must first be made to a dial-up Location.
5. TCP/IP network interface card shall have an option to set the poll frequency and message response time-out settings.
6. PC-to-Controller and Controller-to-Controller communications (direct, dial-up, or TCP/IP) shall use a polled-communication protocol that checks sum and acknowledges each message. All communications shall be verified and buffered and retransmitted if not acknowledged.

D. Controller-to-Controller Communications:

1. Controller-to-Controller Communications: RS-485, 4-wire, point-to-point, regenerative (repeater) communications network methodology.
2. RS-485 communications signal shall be regenerated at each Controller.

2.2 CONTROLLERS

A. Controllers: Intelligent peripheral control unit, complying with UL 294, that stores time, date, valid codes, access levels, and similar data downloaded from the existing Central Station for controlling its operation.

B. Subject to compliance with requirements in this Article, manufacturers may use multipurpose Controllers.

C. Entry-Control Controller:

1. Function: Provide local entry-control functions including one- and two-way communications with access-control devices such as card readers, biometric personal identity verification devices, door strikes, magnetic latches, and door operators.

    a. Operate as a stand-alone portal Controller using the downloaded database during periods of communication loss between the Controller and the field-device network.
    b. Accept information generated by the entry-control devices; automatically process this information to determine valid identification of the individual present at the portal:

        1) On authentication of the credentials or information presented, check privileges of the identified individual, allowing only those actions granted as privileges.
        2) Privileges shall include, but not be limited to, time of day control, day of week control, group control, and visitor escort control.

c. Maintain a date-, time-, and Location-stamped record of each transaction. A transaction is defined as any successful or unsuccessful attempt to gain access through a controlled portal by the presentation of credentials or other identifying information.

2. Inputs:

a. Data from entry-control devices; use this input to change modes between access and secure.
b. Database downloads and updates from the existing Central Station that include enrollment and privilege information.

3. Outputs:

a. Indicate success or failure of attempts to use entry-control devices and make comparisons of presented information with stored identification information.
b. Grant or deny entry by sending control signals to portal-control devices.
c. Maintain a date-, time-, and Location-stamped record of each transaction and transmit transaction records to the existing Central Station.
d. Door Prop Alarm: If a portal is held open for longer than 20 seconds, alarm sounds.

4. With power supplies sufficient to power at voltage and frequency required for field devices and portal-control devices.
5. Data Line Problems: For periods of loss of communications with Central Station, or when data transmission is degraded and generating continuous checksum errors, the Controller shall continue to control entry by accepting identifying information, making authentication decisions, checking privileges, and controlling portal-control devices.

a. Store up to 1000 transactions during periods of communication loss between the Controller and access-control devices for subsequent upload to the Central Station on restoration of communication.

6. Controller Power: NFPA 70, Class II power supply transformer, with 12- or 24-V ac secondary, backup battery and charger.

a. Backup Battery: Premium, valve-regulated, recombinant-sealed, lead-calcium battery; spill proof; with a full 1-year warranty and a pro rata 19-year warranty. With single-stage, constant-voltage-current, limited battery charger, comply with battery manufacturer's written instructions for battery terminal voltage and charging current recommendations for maximum battery life.
b. Backup Power Supply Capacity: 90 minutes of battery supply. Submit battery and charger calculations.
c. Power Monitoring: Provide manual dynamic battery load test, initiated and monitored at the control center; with automatic disconnection of the Controller when battery voltage drops below Controller limits. Report by using local Controller-mounted LEDs and by communicating status to Central Station. Indicate normal power on and battery charger on trickle charge. Indicate and report the following:

1) Trouble Alarm: Normal power off load assumed by battery.

2) Trouble Alarm: Low battery.
3) Alarm: Power off.

2.3 CARD READERS

A. Power: Card reader shall be powered from its associated Controller, including its standby power source.

B. Response Time: Card reader shall respond to passage requests by generating a signal that is sent to the Controller. Response time shall be 800 ms or less, from the time the card reader finishes reading the credential card until a response signal is generated.

C. Enclosure: Suitable for surface, semiflush, or pedestal mounting. Mounting types shall additionally be suitable for installation in the following locations:

1. Indoors, controlled environment.
2. Indoors, uncontrolled environment.
3. Outdoors, with built-in heaters or other cold-weather equipment to extend the operating temperature range as needed for operation at the site.

D. Display: LED or other type of visual indicator display shall provide visual status indications and user prompts. Indicate power on/off, whether user passage requests have been accepted or rejected, and whether the door is locked or unlocked.

E. Touch Plate and Proximity Readers:

1. Active detection proximity card readers shall provide power to compatible credential cards through magnetic induction, and shall receive and decode a unique identification code number transmitted from the credential card.
2. Passive detection proximity card readers shall use a swept-frequency, RF field generator to read the resonant frequencies of tuned circuits laminated into compatible credential cards. The resonant frequencies read shall constitute a unique identification code number.
3. The card reader shall read proximity cards in a range from contact with to at least 6 inches (150 mm) from the reader.

2.4 DOOR AND GATE HARDWARE INTERFACE

A. Exit Device with Alarm: Operation of the exit device shall generate an alarm and annunciate a local alarm. Exit device and alarm contacts are specified in Division 08 Section "Door Hardware."

B. Electric Door Strikes: Use end-of-line resistors to provide power line supervision. Signal switches shall transmit data to Controller to indicate when the bolt is not engaged and the strike mechanism is unlocked, and shall report a forced entry. Power and signal shall be from the Controller. Electric strikes are specified in Division 08 Section "Door Hardware."

C. Electromagnetic Locks: End-of-line resistors shall provide power line supervision. Lock status sensing signal shall positively indicate door is secure. Power and signal shall be from the Controller. Electromagnetic locks are specified in Division 08 Section "Door Hardware."

2.5 TRANSFORMERS

A. NFPA 70, Class II control transformers, NRTL listed. Transformers for security access-control system shall not be shared with any other system.

2.6 CABLE AND ASSET MANAGEMENT

A. Manufacturers:

1. IMAP Textron; Division of Greenlee Textron.
2. Total Wire Software Company, Inc.

B. Computer-based cable and asset management system, with fully integrated database and graphic capabilities, complying with requirements in TIA/EIA-606.

1. Document physical characteristics by recording the network, asset, user, TIA/EAI details, device configurations, and exact connections between equipment and cabling.

a. Manage the physical layer of security system.
b. List device configurations.
c. List and display circuit connections.
d. Record firestopping data.
e. Record grounding and bonding connections and test data.

2. Information shall be presented in database view, schematic plans, or technical drawings.

a. Microsoft Visio Technical Drawing shall be used as drawing and schematic plans software. Drawing symbols, system layout, and design shall comply with SIA AG-01.

3. System shall interface with the following testing and recording devices:

a. Direct upload tests from circuit testing instrument into the PC.
b. Direct download circuit labeling into labeling printer.

C. Software shall be designed for Microsoft Windows of same version as security access system's Central Station shall be installed on the designated PC, using a hard drive dedicated only to this management function. Hard-drive capacity shall be not less than [50] <Insert number> GB.

PART 3 - EXECUTION

3.1 PREPARATION

A. Comply with recommendations in SIA CP-01.

B. Comply with EIA/TIA-606, "Administration Standard for the Telecommunications Infrastructure of Commercial Buildings."

C. Obtain detailed Project planning forms from manufacturer of access-control system; develop custom forms to suit Project. Fill in all data available from Project plans and specifications and publish as Project planning documents for review and approval.

1. Record setup data for control station.
2. For each Location, record setup of Controller features and access requirements.
3. Propose start and stop times for time zones and holidays, and match up access levels for doors.
4. Set up groups, facility codes, linking, and list inputs and outputs for each Controller.
5. Assign action message names and compose messages.
6. Set up alarms. Establish interlocks between alarms, intruder detection, and video surveillance features.
7. Prepare and install alarm graphic maps.
8. Develop user-defined fields.
9. Develop screen layout formats.
10. Propose setups for guard tours and key control.
11. Discuss badge layout options; design badges.
12. Complete system diagnostics and operation verification.
13. Prepare a specific plan for system testing, startup, and demonstration.
14. Develop acceptance test concept and, on approval, develop specifics of the test.
15. Develop cable and asset management system details; input data from construction documents. Include system schematics and Visio Technical Drawings.

D. In meetings with Architect and Owner, present Project planning documents and review, adjust, and prepare final setup documents. Use final documents to set up system software.

3.2 CABLING

A. Comply with NECA 1, "Good Workmanship in Electrical Contracting."

B. Install cables and wiring according to requirements in Division 28 Section "Conductors and Cables for Electronic Safety and Security."

C. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters. Conceal raceway and wiring except in unfinished spaces.

D. Wiring Method: Install wiring in raceway and cable tray except within consoles, cabinets, desks, and counters and except in accessible ceiling spaces and in gypsum board partitions where unenclosed wiring method may be used. Use NRTL-listed plenum cable in environmental air spaces, including plenum ceilings. Conceal raceway and cables except in unfinished spaces.

E. Install LAN cables using techniques, practices, and methods that are consistent with Category 5E rating of components and that ensure Category 5E performance of completed and linked signal paths, end to end.

F. Install cables without damaging conductors, shield, or jacket.

G. Boxes and enclosures containing security system components or cabling, and which are easily accessible to employees or to the public, shall be provided with a lock. Boxes above ceiling level in occupied areas of the building shall not be considered to be accessible. Junction boxes and small device enclosures below ceiling level and easily accessible to employees or the public shall be covered with a suitable cover plate and secured with tamperproof screws.

H. Install end-of-line resistors at the field device location and not at the Controller or panel location.

3.3 CABLE APPLICATION

A. Comply with EIA/TIA-569, "Commercial Building Standard for Telecommunications Pathways and Spaces."

B. Cable application requirements are minimum requirements and shall be exceeded if recommended or required by manufacturer of system hardware.

C. RS-485 Cabling: Install at a maximum distance of 4000 feet (1220 m).

D. Card Readers and Keypads:

1. Install number of conductor pairs recommended by manufacturer for the functions specified.
2. Unless manufacturer recommends larger conductors, install No. 22 AWG wire if maximum distance from Controller to the reader is 250 feet (75 m), and install No. 20 AWG wire if maximum distance is 500 feet (150 m).
3. For greater distances, install "extender" or "repeater" modules recommended by manufacturer of the Controller.
4. Install minimum No. 18 AWG shielded cable to readers and keypads that draw 50 mA or more.

E. Install minimum No. 16 AWG cable from Controller to electrically powered locks. Do not exceed 250 feet (75 m).

F. Install minimum No. 18 AWG ac power wire from transformer to Controller, with a maximum distance of 25 feet (8 m).

3.4 GROUNDING

A. Comply with Division 26 Section "Grounding and Bonding for Electrical Systems."

B. Comply with IEEE 1100, "Power and Grounding Sensitive Electronic Equipment."

C. Ground cable shields, drain conductors, and equipment to eliminate shock hazard and to minimize ground loops, common-mode returns, noise pickup, cross talk, and other impairments.

D. Bond shields and drain conductors to ground at only one point in each circuit.

E. Signal Ground:

1. Terminal: Locate in each equipment room and wiring closet; isolate from power system and equipment grounding.
2. Bus: Mount on wall of main equipment room with standoff insulators.
3. Backbone Cable: Extend from signal ground bus to signal ground terminal in each equipment room and wiring closet.

3.5 INSTALLATION

A. Push Buttons: Where multiple push buttons are housed within a single switch enclosure, they shall be stacked vertically with each push-button switch labeled with 1/4-inch- (6.4-mm-) high text and symbols as required. Push-button switches shall be connected to the Controller associated with the portal to which they are applied, and shall operate the appropriate electric strike, electric bolt, or other facility release device.

B. Install card, fob, and biometric readers.

3.6 IDENTIFICATION

A. In addition to requirements in this Article, comply with applicable requirements in Division 26 Section "Identification for Electrical Systems" and with TIA/EIA-606.

B. Using cable and asset management software specified in Part 2, develop Cable Administration Drawings for system identification, testing, and management. Use unique, alphanumeric designation for each cable, and label cable and jacks, connectors, and terminals to which it connects with same designation. Use logical and systematic designations for facility's architectural arrangement.

C. Label each terminal strip and screw terminal in each cabinet, rack, or panel.

1. All wiring conductors connected to terminal strips shall be individually numbered, and each cable or wiring group being extended from a panel or cabinet to a building-mounted device shall be identified with the name and number of the particular device as shown.
2. Each wire connected to building-mounted devices is not required to be numbered at the device if the color of the wire is consistent with the associated wire connected and numbered within the panel or cabinet.

D. At completion, cable and asset management software shall reflect as-built conditions.

3.7 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect, test, and adjust field-assembled components and equipment installation, including connections and to assist in field testing. Report results in writing.

B. Perform the following field tests and inspections and prepare test reports:

1. LAN Cable Procedures: Inspect for physical damage and test each conductor signal path for continuity and shorts. Use Class 2, bidirectional, Category 5 tester. Test for faulty

connectors, splices, and terminations. Test according to TIA/EIA-568-1, "Commercial Building Telecommunications Cabling Standards - Part 1 General Requirements." Link performance for UTP cables must comply with minimum criteria in TIA/EIA-568-B.

2. Test each circuit and component of each system. Tests shall include, but are not limited to, measurements of power supply output under maximum load, signal loop resistance, and leakage to ground where applicable. System components with battery backup shall be operated on battery power for a period of not less than 10 percent of the calculated battery operating time. Provide special equipment and software if testing requires special or dedicated equipment.
3. Operational Test: After installation of cables and connectors, demonstrate product capability and compliance with requirements. Test each signal path for end-to-end performance from each end of all pairs installed. Remove temporary connections when tests have been satisfactorily completed.

3.8 STARTUP SERVICE

A. Engage a factory-authorized service representative to supervise and assist with startup service. Complete installation and startup checks according to approved procedures that were developed in " Preparation" Article and with manufacturer's written instructions.

1. Enroll and prepare badges and access cards for Owner's operators, management, and security personnel.

3.9 PROTECTION

A. Maintain strict security during the installation of equipment and software. Room housing the control station that has been powered up shall be locked and secured, with an activated burglar alarm and access-control system reporting to a Central Station complying with UL 1610, "Central-Station Burglar-Alarm Units," during periods when a qualified operator in the employ of Contractor is not present.

END OF SECTION 281300

SECTION 282300

VIDEO SURVEILLANCE

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes video surveillance system consisting of cameras, data transmission wiring, and a control station with its associated equipment.

B. Video surveillance system shall be integrated with monitoring and control system specified in Division 28 Section "Access Control" that specifies systems integration.

1.2 SUBMITTALS

A. Product Data: For each type of product indicated, including dimensions and data on features, performance, electrical characteristics, ratings, and finishes.

B. Shop Drawings: Detail assemblies of standard components that are custom assembled for specific application on this Project.

1. Functional Block Diagram: Show single-line interconnections between components for signal transmission and control. Show cable types and sizes.
2. Dimensioned plan and elevations of equipment racks, control panels, and consoles. Show access and workspace requirements.
3. UPS: Sizing calculations.
4. Wiring Diagrams: Power, signal, and control wiring, and grounding.

C. Equipment List: Include every piece of equipment by model number, manufacturer, serial number, location, and date of original installation.

1. Dimensioned Outline Drawings of Equipment Unit: Identify center of gravity and locate and describe mounting and anchorage provisions.
2. Detailed description of equipment anchorage devices on which the certification is based.

D. Field quality-control test reports.

E. Operation and maintenance data.

1.3 QUALITY ASSURANCE

A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

B. Comply with NECA 1.

C. Comply with NFPA 70.

D. Electronic data exchange between video surveillance systems with an access control system shall comply with SIA TVAC.

1.4 PROJECT CONDITIONS

A. Environmental Conditions: Capable of withstanding the following environmental conditions without mechanical or electrical damage or degradation of operating capability:
1. Interior, Controlled Environment: System components, except central-station control unit, installed in temperature-controlled interior environments shall be rated for continuous operation in ambient temperatures of [**36 to 122 deg F (2 to 50 deg C)**] dry bulb and 20 to 90 percent relative humidity, noncondensing. NEMA 250, Type 1 enclosures.
2. Security Environment: Camera housing for use in high-risk areas where surveillance equipment may be subject to physical violence.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with existing system requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.
2. Manufacturers: Subject to compliance with requirements, provide products by the existing manufacturers specified.

2.2 SYSTEM REQUIREMENTS

A. Video signal format shall comply with the NTSC standard composite video, interlaced. Composite video signal termination shall be 75 ohms.

B. Surge Protection: Protect components from voltage surges entering through power, communication, signal, control, or sensing leads. Include surge protection for external wiring of each conductor entry connection to components.
1. Minimum Protection for Communication, Signal, Control, and Low-Voltage Power Connections: Comply with manufacturer's recommendation for type of line being protected.

2.3 STANDARD CAMERAS

A. Manufacturers: subject to compliance to existing system.

B. Color Camera:

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 771(H) by 492(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions.
7. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
8. Manually selectable modes for backlight compensation or normal lighting.
9. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
10. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
11. Motion Detector: Built-in digital.

C. Automatic Color Dome Camera: Assembled and tested as a manufactured unit, containing a dome assembly, color camera, motorized pan and tilt, zoom lens, and receiver/driver.

1. Comply with UL 639.
2. Pickup Device: CCD interline transfer, 380,000 768(H) by 494(V) pixels.
3. Horizontal Resolution: 480 lines.
4. Signal-to-Noise Ratio: Not less than 50 dB, with the camera AGC off.
5. With AGC, manually selectable on or off.
6. Sensitivity: Camera shall provide usable images in low-light conditions. Sensitivity: Camera shall deliver 1-V peak-to-peak video signal at the minimum specified light level. The illumination for the test shall be with lamps rated at approximately 2200-K color temperature, and with the camera AGC off.
7. Manually selectable modes for backlight compensation or normal lighting.
8. Pan and Tilt: Direct-drive motor, 360-degree rotation angle, and 180-degree tilt angle. Pan-and-tilt speed shall be variable controlled by operator. Movement from preset positions shall be not less than 300 degrees per second.
9. Preset Positioning: 8 user-definable scenes, each allowing 16-character titles. Controls shall include the following:

    a. In "sequence mode," camera shall continuously sequence through preset positions, with dwell time and sequencing under operator control.
    b. Motion detection shall be available at each camera position.
    c. Up to four preset positions may be selected to be activated by an alarm. Each of the alarm positions may be programmed to output a response signal.

10. Scanning Synchronization: Determined by external synch over the coaxial cable. Camera shall revert to internally generated synchronization on loss of external synch signal.
11. White Balance: Auto-tracing white balance, with manually settable fixed balance option.
12. Motion Detector: Built-in digital.

13. Dome shall support multiplexed control communications using coaxial cable recommended by manufacturer.

2.4 LENSES

A. Manufacturers: Subject to compliance of existing system.

B. Description: Optical-quality coated optics, designed specifically for video surveillance applications, and matched to specified camera. Provide color-corrected lenses.

1. Auto-Iris Lens: Electrically controlled iris with circuit set to maintain a constant video level in varying lighting conditions.
2. Fixed Lenses: With calibrated focus ring.
3. Zoom Lenses: Motorized, remote-controlled units, rated as "quiet operating." Features include the following:

    a. Electrical Leads: Filtered to minimize video signal interference.
    b. Motor Speed: Variable.
    c. Lens shall be available with preset positioning capability to recall the position of specific scenes.

2.5 POWER SUPPLIES

A. Power Supplies: Type as recommended by camera and lens manufacturer.

1. Enclosure: NEMA 250, Type 1.

2.6 CAMERA-SUPPORTING EQUIPMENT

A. Manufacturers: Subject to compliance of existing system.

B. Minimum Load Rating: Rated for load in excess of the total weight supported times a minimum safety factor of two.

C. Pan-and-Tilt Units: Motorized units arranged to provide remote-controlled aiming of cameras with smooth and silent operation and equipped with matching mounting brackets.

1. Panning Rotation: 0 to 355 degrees, with adjustable stops.
2. Tilt Movement: 90 degrees, plus or minus 5 degrees, with adjustable stops.
3. Speed: 12 degrees per second in both horizontal and vertical planes.
4. Wiring: Factory prewired for camera and zoom lens functions and pan-and-tilt power and control.
5. Built-in encoders or potentiometers for position feedback.
6. Pan-and-tilt unit shall be available with preset positioning capability to recall the position of a specific scene.

D. Mounting Brackets for Fixed Cameras: Type matched to items supported and mounting conditions. Include manual pan-and-tilt adjustment.

E. Protective Housings for Fixed and Movable Cameras: Steel enclosures with internal camera mounting and connecting provisions.

1. Tamper switch on access cover sounds an alarm signal when unit is opened or partially disassembled. Central-control unit shall identify tamper alarms and indicate location in alarm display. Tamper switches and central-control unit are specified in Division 28 Section "Intrusion Detection."
2. Camera Viewing Window: Polycarbonate window, aligned with camera lens.
3. Duplex Receptacle: Internally mounted.
4. Alignment Provisions: Camera mounting shall provide for field aiming of camera and permit removal and reinstallation of camera lens without disturbing camera alignment.
5. With sun shield that does not interfere with normal airflow around the housing.
6. Mounting bracket and hardware for wall or ceiling mounting of the housing. Bracket shall be of same material as the housing; mounting hardware shall be stainless steel.
7. Finish: Housing and mounting bracket shall be factory finished using manufacturer's standard finishing process suitable for the environment.
8. Enclosure Rating: IEC 60529, IP 52

2.7 COLOR MONITORS

A. Manufacturers: Subject to compliance of existing system.

B. Screen Size (Diagonal Dimension): 42”

C. Horizontal Resolution: 300 lines.

D. Minimum Front Panel Devices and Controls: Power switch, power-on indicator, and brightness, contrast, color, and tint controls.

E. Degaussing: Automatic.

F. Electrical: 120-V ac, 60 Hz.

2.8 SIGNAL TRANSMISSION COMPONENTS

A. Cable: Coaxial cable elements have 75-ohms nominal impedance. Cables shall comply with Division 27 Section "Master Antenna Television System."

B. Video Surveillance Coaxial Cable Connectors: BNC type, 75 ohms. Of three-piece construction, consisting of a crimp-type center tit, sleeve, and main body.

PART 3 - EXECUTION

3.1 WIRING

A. Wiring Method: Install cables in raceways, except in accessible indoor ceiling spaces**,** and as otherwise indicated. Conceal raceways and wiring except in unfinished spaces.

B. Wiring Method: Install cables concealed in accessible ceilings, walls, and floors where possible.

C. Wiring within Enclosures: Bundle, lace, and train conductors. Provide and use lacing bars and distribution spools.

D. Splices, Taps, and Terminations: For power and control wiring, use numbered terminal strips in junction, pull, and outlet boxes; terminal cabinets; and equipment enclosures. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values.

E. Grounding: Provide independent-signal circuit grounding recommended in writing by manufacturer.

3.2 VIDEO SURVEILLANCE SYSTEM INSTALLATION

A. Install cameras with 84-inch- (2134-mm-) minimum clear space below cameras and their mountings. Change type of mounting to achieve required clearance.

B. Set pan-and-tilt unit stops to suit final camera position and to obtain the field of view required for camera. Connect all controls and alarms, and adjust.

C. Avoid ground loops by making ground connections at only the control station.

1. For 12- and 24-V dc cameras, connect the coaxial cable shields only at the monitor end.

D. Identify system components, wiring, cabling, and terminals according to Division 26 Section "Identification for Electrical Systems."

3.3 FIELD QUALITY CONTROL

A. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect field-assembled components and equipment installation and supervise pretesting, testing, and adjusting of video surveillance equipment.

B. Pretesting: Align and adjust system and pretest components, wiring, and functions to verify that they comply with specified requirements. Conduct tests at varying lighting levels, including day and night scenes as applicable. Prepare video surveillance equipment for acceptance and operational testing as follows:

1. Verify operation of auto-iris lenses.

2. Set back-focus of fixed focal length lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Adjust until image is in focus with and without the filter.
3. Set back-focus of zoom lenses. At focus set to infinity, simulate nighttime lighting conditions by using a dark glass filter of a density that produces a clear image. Additionally, set zoom to full wide angle and aim camera at an object 50 to 75 feet (17 to 23 m) away. Adjust until image is in focus from full wide angle to full telephoto, with the filter in place.
4. Set and name all preset positions; consult Owner's personnel.
5. Set sensitivity of motion detection.
6. Connect and verify responses to alarms.
7. Verify operation of control-station equipment.

C. Test Schedule: Schedule tests after pretesting has been successfully completed and system has been in normal functional operation for at least 14 days. Provide a minimum of 10 days' notice of test schedule.

D. Operational Tests: Perform operational system tests to verify that system complies with Specifications. Include all modes of system operation.

E. Record test results for each piece of equipment.

F. Retest: Correct deficiencies identified by tests and observations and retest until specified requirements are met.

END OF SECTION 282300

PROJECT INFORMATION

NEW SECURITY VESTIBULE RENOVATIONS FOR:

MONOCACY MIDDLE SCHOOL

FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

CONTACT LIST

OWNER:

FREDERICK COUNTY PUBLIC SCHOOLS
191 SOUTH EAST STREET
FREDERICK, MD 21701
TEL. : (301)-644-5000

ARCHITECT:

PROFFITT & ASSOCIATES ARCHITECTS, PC
49 SOUTH CARROLL STREET
FREDERICK, MD 21701
TEL. : (301)-662-8532
FAX : (301)-662-4192

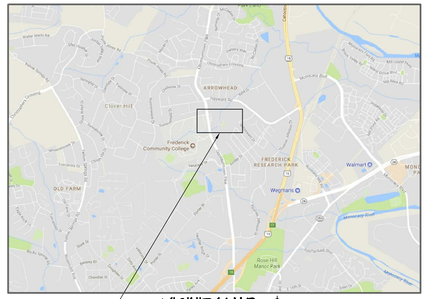
MECH. / ELEC. ENGINEER :

CJL ENGINEERING INC.
3 WEST SECOND STREET
FREDERICK, MD 21701
TEL. : (301)-695-9424
FAX : (301)-293-6338

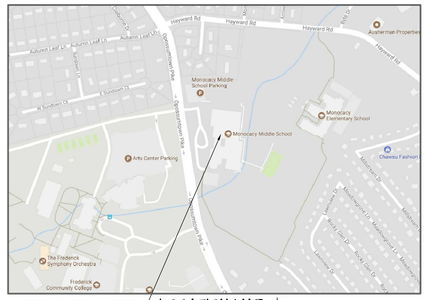
GENERAL NOTES

1. BIDDERS SHALL CAREFULLY EXAMINE THE PERMIT DOCUMENTS, ACQUAINT THEMSELVES WITH ALL GOVERNING LAWS AND CODES, VISIT THE SITE AND THOROUGHLY FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS BEFORE SUBMITTING BIDS.
2. ALL WORK DESCRIBED WITHIN THE CONTRACT DOCUMENTS SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, INCLUDING BUT NOT LIMITED TO, THE CURRENT BUILDING CODE, LIFE SAFETY CODE, ADAAG, AS WELL AS ORDINANCES AND REGULATIONS AND OTHER BUILDING CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND WARRANTY REQUIREMENTS.
4. INDIVIDUAL SUBCONTRACTORS FOR ANY PLUMBING, ELECTRICAL, AND MECHANICAL WORK SHALL OBTAIN ALL NECESSARY PERMITS, INSPECTIONS, ETC., AND PERFORM ALL WORK IN CONFORMANCE TO ALL LOCAL CODES.
5. DISTURB AS SMALL AN AREA OF THE SITE AS POSSIBLE DURING CONSTRUCTION OPERATIONS; UNLESS OTHERWISE NOTED, PREPARE AND SEED DISTURBED AREAS AT THE COMPLETION OF THE PROJECT.
6. REPAIR ALL AREAS DISTURBED BY THE WORK OF THIS PROJECT, INCLUDING SUBSTRATES OR STRUCTURAL REPAIRS, AND REPAIRS TO FINISHES TO MATCH AND ALIGN WITH EXISTING FINISHES TO REMAIN OR NEW FINISHES INSTALLED.
7. THE JOB SITE IS TO BE LEFT CLEAN AND FREE FROM DEBRIS AT ALL TIMES.
8. UNLESS OTHERWISE NOTED, ALL WORK IS CONSIDERED TO BE NEW CONSTRUCTION.
9. CONTRACTOR TO PROTECT ALL EXISTING UNDERGROUND UTILITIES AND VERIFY LOCATION PRIOR TO ANY EXCAVATION.
10. CONTRACTOR SHALL PROVIDE ALL NECESSARY SHORING, BRACING, AND TAKE OTHER PRECAUTIONS NECESSARY FOR SAFETY AS REQUIRED BY CODE AND PRACTICE.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY BLOCKING, CONCEALED WITHIN THE WALLS, FOR ATTACHMENT OF SURFACE AND/OR RECESSED MOUNTED EQUIPMENT OR ACCESSORIES, WHETHER SHOWN IN THE DRAWINGS OR NOT. BLOCKING TO BE FIRE RETARDANT.
12. CONTRACTOR SHALL SUPPLY ALL NECESSARY ANCHORS, TIES, CLIPS, HANGERS, BOLTS, AND OTHER FASTENING DEVICES AS REQUIRED BY CODE AND GOOD PRACTICE.
13. CONTRACTOR SHALL PROVIDE SEALANT AROUND WINDOWS, DOOR JAMBS AND HEADS, AND ADJACENT CONSTRUCTION.
14. PART OF THIS WORK MAY INCLUDE THE INSTALLATION AND/OR MODIFICATION OF A SPRINKLER SYSTEM IN AN EXISTING BUILDING. CONTRACTOR IS RESPONSIBLE TO CONCEAL ALL NEW PIPING WITHIN EXISTING CONSTRUCTION AND MAKE REPAIRS AS NECESSARY TO MATCH EXISTING OR NEW FINISHES.
15. PRIOR TO MODIFICATION OR ADDITION OF SPRINKLER IN EXISTING BUILDING, SUBCONTRACTOR TO CONFIRM FINAL CEILING HEIGHT WITH CONTRACTOR DUE TO JOB CONDITIONS.
16. EXISTING BUILDING INFORMATION IS BASED ON INFORMATION PROVIDED BY OTHERS AND PROFFITT & ASSOCIATES ARCHITECTS' FIELD SURVEYS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD PRIOR TO SUBMITTING SHOP DRAWINGS, AND BEFORE CONSTRUCTION AND FABRICATION OF MATERIALS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES FROM THE INFORMATION PROVIDED IN A TIMELY MANNER.
17. DRAWING INTENT IS TO INDICATE GENERAL ARRANGEMENT, DESIGN AND INTENT OF WORK AND IS PARTIALLY DIAGRAMMATIC. IT SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS, INCLUDING CONSTRUCTION OR FABRICATION. ALL DIMENSIONS FOR BUILT-IN ITEMS SHALL BE BASED ON FIELD DIMENSIONS. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF DIMENSIONS.
18. DIMENSIONS, NOTES, FINISHES AND FIXTURES SHOWN ON TYPICAL PLANS, SECTIONS OR DETAILS SHALL APPLY TO SIMILAR, SYMMETRICAL, OR OPPOSITE PLANS, SECTIONS OR DETAILS.
19. SEE WALL TYPE NOTES FOR ADDITIONAL INFORMATION REGARDING TYP. WALL TYPES.
20. REFER TO THE GENERAL SPECIFICATIONS.

VICINITY & LOCATION MAP



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

LEGEND

- BRICK
- CMU
- CONCRETE
- FINISHED WOOD
- ROUGH WOOD
- PLYWOOD
- METAL
- GYPSUM BOARD
- RIGID INSULATION
- BATT INSULATION
- WINDOW OPENING (12)
- DOOR / FRAME SEE SCHEDULE (1-202)
- ROOM NAME / ROOM NUMBER (3042 ROOM NAME, 9F)
- COLUMN REFERENCE (12, G)
- DETAIL NUMBER / SHEET TO LOCATE DETAIL (5, A5.2)
- DIRECTION OF VIEW / ELEVATION NUMBER / SHEET TO LOCATE ELEVATION (1, A3.1)
- DIRECTION OF CUTTING PLANE / SECTION NUMBER / SHEET TO LOCATE SECTION (2, A4.1)
- EXTENT OF SECTION CUT
- WALL TYPE (2)
- WALL TYPE, FIRE-RATED (2)
- REVISION NUMBER (3)
- KEY NOTE (N)
- FIN. FLR. ± HEIGHT INDICATOR (ABOVE FINISHED FLOOR, ABOVE SEA LEVEL)
- INTERIOR ELEVATION KEY: (A, B, C, D, 1, A8.1) — ELEVATION INDICATOR / SHEET TO LOCATE ELEVATION / DIRECTION OF VIEW

ABBREVIATIONS

∠	ANGLE	JAN.	JANITOR
ACOUS.	ACOUSTIC	JT.	JOINT
ACT	ACOUSTICAL CEILING TILE	LAM.	LAMINATE
A.D.	AREA DRAIN	LAV.	LAVATORY
ADJ.	ADJUSTABLE	LIN. FT.	LINEAR FEET
A.F.F.	ABOVE FINISHED FLOOR	LG.	LONG
AIR COND.	AIR CONDITIONING	L.L.H.	LONG LEG HORIZONTAL
ALT.	ALTERNATE	L.L.V.	LONG LEG VERTICAL
ALUM.	ALUMINUM		
ANCH.	ANCHORED	MAS.	MASONRY
A.P.	ACCESS PANEL	MATL.	MATERIAL
APPROX.	APPROXIMATE	MAX.	MAXIMUM
ARCH.	ARCHITECT	MECH.	MECHANICAL
		MFGR.	MANUFACTURER
BD.	BOARD	MIN.	MINIMUM
BIT.	BITUMINOUS	MISC.	MISCELLANEOUS
BLDG.	BUILDING	M.O.	MASONRY OPENING
BLK'G	BLOCKING	MTD.	MOUNTED
B.O.F.	BOTTOM OF FOOTING	MTL.	METAL
BOT.	BOTTOM		
BRG.	BEARING	NAT.	NATURAL
		N.I.C.	NOT IN CONTRACT
℄	CENTER LINE	NO.	NUMBER
CAB.	CABINET	NOM.	NOMINAL
C.J.	CONSTRUCTION JOINT	N.T.S.	NOT TO SCALE
CLG.	CEILING		
CLG. HT.	CEILING HEIGHT	O.A.	OVERALL
CLO.	CLOSET	O/C	ON CENTER
CLR.	CLEAR	O.D.	OUTSIDE DIMENSION
CMU	CONCRETE MASONRY UNIT	OH.	OVERHANG
CNTRL. JT.	CONTROL JOINT	O/O	OUT TO OUT
C.O.	CLEAN OUT	OPG.	OPENING
COL.	COLUMN	OPP.	OPPOSITE
CONC.	CONCRETE		
CONT.	CONTINUOUS	PSB	PAINTED GYPSUM BOARD
CORR.	CORRIDOR	PL. P.	PLATE
C.T.	CERAMIC TILE	PLAS. LAM.	PLASTIC LAMINATE
CTR.	CENTER	PLYWD.	PLYWOOD
		POL.	POLISHED
⌀	DIAMETER	PREFAB.	PREFABRICATED
DBL.	DOUBLE	PREFIN.	PREFINISHED
D.F.	DRINKING FOUNTAIN	PR.	PAIR
DIA.	DIAMETER	P.T.	PRESSURE TREATED
DIM.	DIMENSION	PTD.	PAINTED
DR.	DOOR	P.V.C.	POLYVINYL CHLORIDE
DN.	DOWN		
DS.	DOWNSPOUT	R.	RISERS
DTL.	DETAIL	R.D.	ROOF DRAIN
DWG.	DRAWING	RECEPT.	RECEPTACLE
		REINF.	REINFORCING
EA.	EACH	REQ'D	REQUIRED
E.J.	EXPANSION JOINT	REV.	REVISED
EL., ELEV.	ELEVATION	RM.	ROOM
ELEC.	ELECTRIC	R.O.	ROUGH OPENING
EQ.	EQUAL		
EQUIP.	EQUIPMENT	SCHED.	SCHEDULE
E.W.	EACH WAY	SECT.	SECTION
E.W.C.	ELECTRIC WATER COOLER	SHT.	SHEET
EX., EXIST.	EXISTING	SIM.	SIMILAR
EXP.	EXPANSION	S.M.P.	SOLID MASONRY PIER
EXT.	EXTERIOR	SPECS.	SPECIFICATIONS
F.D.	FLOOR DRAIN	SQ.	SQUARE
F.E.	FIRE EXTINGUISHER	ST. STL.	STAINLESS STEEL
F.E.C.	FIRE EXTINGUISHER CABINET	STD.	STANDARD
FIN.	FINISH	STL.	STEEL
FL., FLR.	FLOOR	STOR.	STORAGE
FLUOR.	FLUORESCENT	STRUCT.	STRUCTURAL
F.O.E.X.	FACE OF EXISTING	SUSP.	SUSPENDED
FURR.	FURRING/FURRED	SYM.	SYMMETRICAL
FT. , '	FOOT/FEET		
FTG.	FOOTING	T.	TREAD
		T&G	TONGUE & GROOVE
GA.	GAUGE	TEL.	TELEPHONE
GALV.	GALVANIZED	THK.	THICKNESS
G.C.	GENERAL CONTRACTOR	THRU.	THROUGH
GL.	GLASS	T.O.S.	TOP OF SLAB
GRD.	GRADE	T.O.STL.	TOP OF STEEL
GYP. BD., GWB	GYPSUM WALL BOARD	TYP.	TYPICAL
		U.O.N.	UNLESS OTHERWISE NOTED
H.C.	HANDICAPPED		
H.B.	HOSE BIB	VAR.	VARIES
HDW.	HARDWARE	V.G.T.	VINYL COMPOSITION TILE
H.M.	HOLLOW METAL	VERT.	VERTICAL
HORIZ.	HORIZONTAL	VEST.	VESTIBULE
HT.	HEIGHT	V.I.F.	VERIFY IN FIELD
HVAC	HEATING, VENTILATION & AIR CONDITIONING	V.W.C.	VINYL WALL COVERING
		W	WITH
I.D.	INSIDE DIAMETER	W.	WIDTH
IN., "	INCHES	WD.	WOOD
INFO.	INFORMATION	WDW.	WINDOW
		WGT., WT.	WEIGHT
INSUL.	INSULATION	W/O	WITHOUT
INT.	INTERIOR	WP.	WEATHERPROOF
		WWF	WELDED WIRE FABRIC

DRAWINGS LIST

SCOPE OF WORK - BASE BID AND ALTERNATES

THIS PROJECT CONSISTS OF INTERIOR RENOVATIONS TO AN EXISTING SCHOOL FOR A NEW SECURITY VESTIBULE. THE DESIGN IS INTENDED TO RECONFIGURE THE EXISTING ENTRANCE TO CREATE A SECURED VESTIBULE THAT DIRECTS ALL VISITORS TO THE MAIN OFFICE.

BASE BID IMPROVEMENTS TO THE SPACE ARE LIMITED TO INTERIOR WORK AND INCLUDE ALL OR MOST OF THE FOLLOWING ASPECTS:

SELECTIVE DEMOLITION - PROJECT INCLUDES REMOVAL OF EXISTING NON-BEARING STUD PARTITIONS AND/OR MASONRY WALLS, DOORS, FRAMES, HARDWARE, INTERIOR WINDOWS, CEILINGS, AND OTHER FINISH SYSTEM COMPONENTS.

CARPENTRY AND GENERAL TRADES - THE PROJECT REQUIRES INSTALLATION OF NEW LIGHT GAUGE METAL STUD WALLS, NEW DOORS AND HARDWARE.

DOORS AND WINDOWS - THE PROJECT INCLUDES RETROFIT OF EXISTING AND/OR INSTALLATION OF NEW STOREFRONT DOORS, FRAMES, AND HARDWARE.

FINISHES - THE PROJECT REQUIRES RETROFIT OF EXISTING FINISHES AND INSTALLATION OF NEW FLOOR AND CEILING FINISH SYSTEMS IN THE WORK AREA SHOWN. THE PROJECT ALSO REQUIRES WALL PAINTING INCLUDING EXISTING WALLS IMMEDIATELY ADJACENT TO THE WORK AREA.

SPRINKLER SYSTEM - THE BUILDING IS EQUIPPED WITH A SPRINKLER SYSTEM THAT WILL REQUIRE RETROFIT TO ACCOMMODATE THE NEW STOREFRONT LAYOUT. THE SCOPE OF SPRINKLER WORK IS EXPECTED TO BE LIMITED TO ADJUSTING HEAD LOCATIONS AND ADDING HEADS WHERE NECESSARY.

MECHANICAL - THE PROJECT REQUIRES THE RETROFIT OF THE EXISTING HEATING AND COOLING SYSTEM. THE SYSTEM IS CONFIGURED WITH DUCTED SUPPLY AND DUCTED RETURN.

ELECTRICAL - THE PROJECT INCLUDES RETROFIT OF EXISTING AND INSTALLATION OF NEW LOW VOLTAGE ACCESS CONTROL DEVICES AS WELL AS NEW LIGHTING, NEW POWER/DATA DISTRIBUTION AND DEVICES, NEW WIRING AND RACEWAYS AND NEW SOUND SYSTEM.

NO SITE WORK OR UTILITY WORK IS INCLUDED.
NO CONCRETE WORK IS INCLUDED.
NO MASONRY WORK IS INCLUDED.
NO STRUCTURAL STEEL OR MISCELLANEOUS METAL WORK IS INCLUDED.
NO PLUMBING WORK IS INCLUDED.
NO EXTERIOR ENVELOPE WORK OR ROOF WORK IS INCLUDED.

SECURITY DOOR HARDWARE AND ACCESS CONTROL

BASE BID — INCLUDES NON-ELECTRIFIED MANUALLY SECURED HARDWARE AT NEW CROSS CORRIDOR DOORS

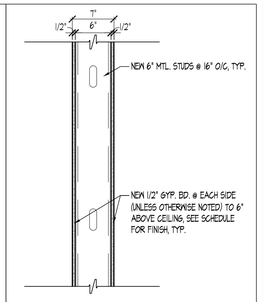
ALTERNATE #1A — INCLUDES ADDING ELECTRONIC HARDWARE AND TIMERS AT NEW CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE. ELECTRONIC HARDWARE TO BE PROGRAMMED VIA THE FCPS SECURITY SYSTEM TO CONTROL THE LOCK AND UNLOCK OF NEW CORRIDOR DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. NO CARD READERS ARE INCLUDED.

ALTERNATE #1B — INCLUDES ADDING CARD READERS AT BOTH SIDES OF NEW CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE.

WALL TYPE NOTES:

1. EXTERIOR DIMENSIONS ARE TO FINISHED FACE OF MASONRY, UNLESS OTHERWISE INDICATED.
2. INTERIOR DIMENSIONS ARE TO FINISHED FACE OF EXISTING WALLS, CENTER LINES OF COLUMNS, CENTER OF OPENINGS AT METAL FRAMING, AND/OR ARE TO FACE OF NEW METAL STUDS, UNLESS OTHERWISE INDICATED.
3. FIRESTOP ALL FRAMED PARTITIONS AS REQUIRED BY CODE.
4. WALL TYPES SHALL BE THE SAME CONTINUOUS TO END OF WALL OR NEXT WALL TYPE DESIGNATION.
5. SIMILAR WALL TYPES SHALL BE CARRIED ABOVE ALL DOORS, WINDOWS, AND OPENINGS U.O.N.
6. EXTEND ALL NEW WALLS/ INSULATION TO UNDERSIDE OF FINISHED CEILING, UNLESS OTHERWISE INDICATED.
7. PROVIDE SMOKE PARTITIONS & RATED WALLS AS SHOWN ON EGRESS PLAN.

(-) RATED WALL TYPE (-) NON-RATED WALL TYPE



1	6" NON-RATED INTERIOR METAL STUD PARTITION

1 / A0.1 TYPICAL WALL TYPES
SCALE: 1" = 1'-0"
SCALE 1 1/2 0 1/2 1 1-1/2 2 FEET

ADA MANEUVERING CLEARANCES AT DOORS

SCALE: 1/4" = 1'-0"

NOTE: '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN' FIGURE NUMBERS REFERENCED, FOR ADDITIONAL INFORMATION REFER TO THE FULL '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN'.

SCALE 4 2 0 2 4 6 8 FEET

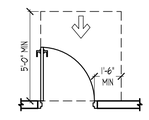


FIGURE 404.2.4.1 (a)
FRONT APPROACH, PULL SIDE

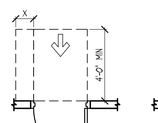


FIGURE 404.2.4.1 (b) & (c)
FRONT APPROACH, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH)

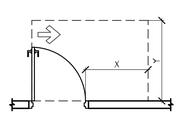


FIGURE 404.2.4.1 (d) & (e)
HINGE APPROACH, PULL SIDE
(NOTE: X = 36" IF Y = 60" OR X = 42" IF Y = 54")

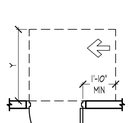


FIGURE 404.2.4.1 (f) & (g)
HINGE APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH, THEN Y = 48")

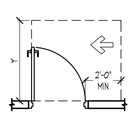


FIGURE 404.2.4.1 (h) & (i)
LATCH APPROACH, PULL SIDE
(NOTE: Y = 48" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 54")

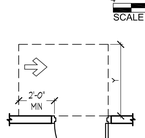


FIGURE 404.2.4.1 (j) & (k)
LATCH APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 48")

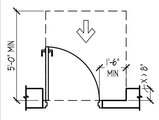


FIGURE 404.2.4.3 (a)
RECESSED DOOR, PULL SIDE

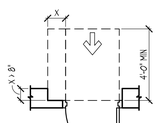


FIGURE 404.2.4.3 (b) & (c)
RECESSED DOOR, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH CLOSER & LATCH)

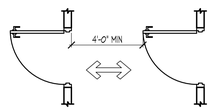


FIGURE 404.2.6 (a)
DOORS & GATES IN A SERIES

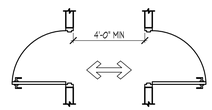


FIGURE 404.2.6 (b)
DOORS & GATES IN A SERIES

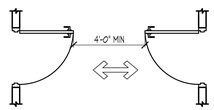


FIGURE 404.2.6 (c)
DOORS & GATES IN A SERIES

Proffitt & Assoc. ARCHITECTS
49 SOUTH CARROLL STREET
FREDERICK, MARYLAND 21701
PHONE (301) 662-8532
FAX (301) 662-4192
info@proffittandassociates.com

I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE No. 14510
EXPIRATION DATE 03-07-2020

NEW SECURITY VESTIBULE RENOVATIONS FOR:
MONOCACY MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.04
DATE: 02-23-2018

COVER SHEET

A0.1

CODE ANALYSIS:

REFERENCE IBC 2015

IBC CONSTRUCTION CLASSIFICATION: 2B — IBC USE GROUP E: EDUCATIONAL

ALLOWABLE HEIGHT & AREA CALCULATIONS:
(PER TABLES 504.3, 504.4 & 506.2, SPRINKLERED)
ALLOWABLE AREA PERMITTED PER FLOOR: 58,000 S.F.
ALLOWABLE BUILDING HEIGHT (ABOVE GRADE PLANE): 3 STORIES (75'-0")
ACTUAL HEIGHT & AREA CALCULATIONS:
TOTAL ACTUAL EXISTING FOOTPRINT (COMBINED 4 FIRE AREAS): 115,322 S.F.
TOTAL ACTUAL HEIGHT (ABOVE GRADE PLANE): 1 STORY (25'-0")
NOTE: NO ADDITIONS OR INCREASE IN AREA OR OCCUPANT LOAD TO EXISTING BUILDING.

NOTES:

NO PROPOSED BUILDING ADDITIONS OR INCREASE IN OCCUPANT LOAD WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS. NO CHANGES TO EXISTING EGRESS CAPACITY OR EXISTING PLUMBING FIXTURES WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS.

BUILDING CODE REQUIREMENTS:

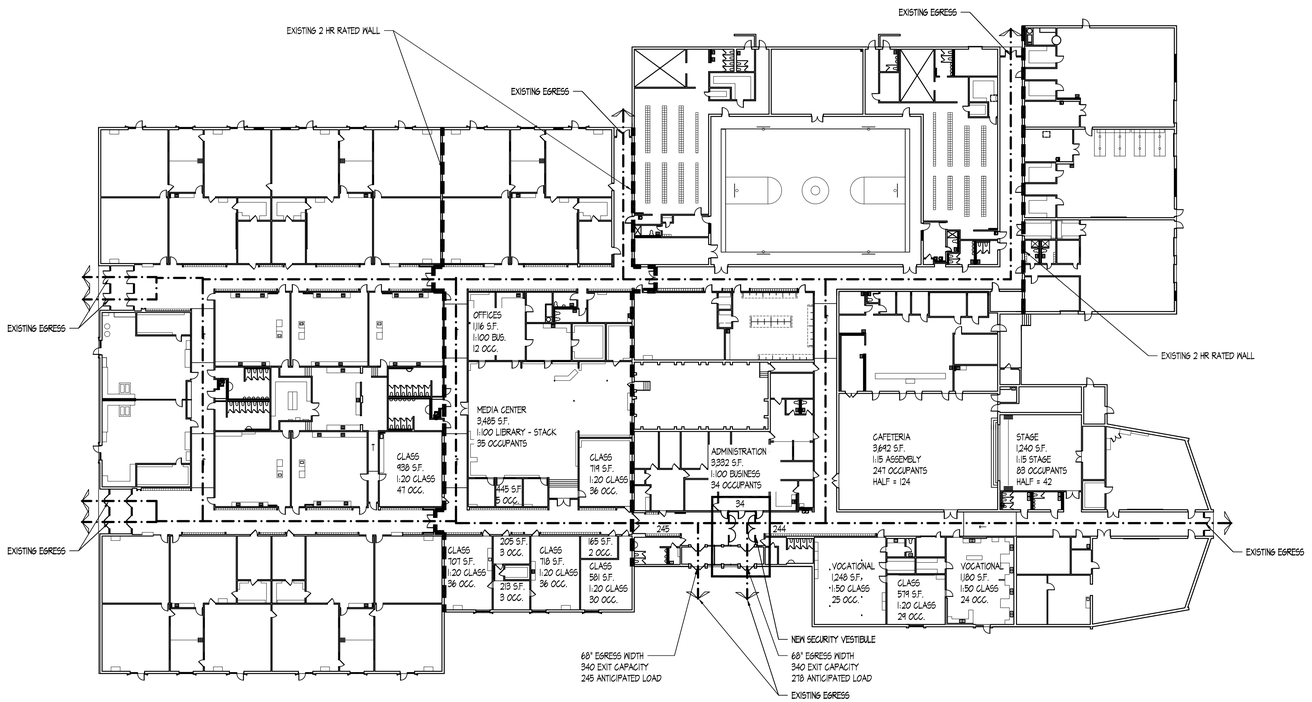
NOTE: REQUIREMENTS 'X'ED OUT ARE LESS STRINGENT. MORE STRINGENT REQUIREMENTS ARE USED.

	REQUIRED	
ITEM	IBC 2015	NFPA-101 2015
EXTERIOR WALLS (LOAD-BEARING)	PER TABLE 601 & 602: X ≥ 30' FIRE SEPARATION DIST. 0 HOURS	
EXTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601 & 602: X ≥ 30' FIRE SEPARATION DIST. 0 HOURS	
PRIMARY STRUCTURAL FRAME	PER TABLE 601: 0 HOURS	
FLOOR CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
ROOF CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (LOAD-BEARING)	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601: 0 HOURS	
FIRE WALLS	PER TABLE 706.4, EXC A: 2 HOURS	PER SECTION 7.2.4.3: 2 HOURS
FIRE PARTITIONS	PER SECTION 708.3: 1 HOUR	PER SECTION 15.3.6 (2): NO SPECIAL REQUIREMENTS
CORRIDORS	PER TABLE 1020.1: 0 HOURS W/ SPRINKLER SYSTEM	PER SECTION 15.3.6 (2): 0 HOURS W/ SPRINKLER SYSTEM
DEAD END CORRIDORS	PER SECTION 1020.4, EXC 2: 50' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.5.2: 50' MAX W/ SPRINKLER SYSTEM
COMMON PATH OF TRAVEL	PER SECTION 1006.2.1: 75' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.6.3.1: 100' MAX W/ SPRINKLER SYSTEM
EXIT ACCESS TRAVEL	PER TABLE 1017.2: 250' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.6.3: 200' MAX W/ SPRINKLER SYSTEM
REMOTENESS	PER SECTION 1007.1.1(2): 1/3 OF DIAG. DISTANCE	PER SECTION 7.5.1.3.3: 1/3 OF DIAG. DISTANCE
CORRIDOR WIDTH	PER SECTION 1020.2: 44" W/ CAPACITY < 100 72" W/ CAPACITY ≥ 100	PER SECTION 15.2.3.2: 72" EXIT ACCESS CORRIDORS
	PER SECTION 1005.3.2: 0.2" PER OCCUPANT	PER TABLE 7.3.3.1: 0.2" PER OCCUPANT
STAIRWAY WIDTH	PER SECTION 1011.2: 36" W/ CAPACITY < 50 44" W/ CAPACITY ≥ 50	PER TABLE 7.2.2.2.1.2(B): TOTAL CUMULATIVE OCC. LOAD: 44" W/ CAPACITY < 2000 56" W/ CAPACITY > 2000
	PER SECTION 1005.3.1: 0.3" PER OCCUPANT	PER TABLE 7.3.3.1: 0.3" PER OCCUPANT

APPLICABLE BUILDING CODES:

AUTHORITY HAVING JURISDICTION: CITY OF FREDERICK, MARYLAND

1. BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE (IBC) WITH AMENDMENTS
MARYLAND BUILDING REHABILITATION CODE COMAR
2. FIRE CODE: 2015 NFPA 101 LIFE SAFETY CODE (LSC) W/ AMENDMENTS
2015 NFPA 1 FIRE CODE (LSC) W/ AMENDMENTS
MARYLAND STATE FIRE PREVENTION CODE
3. MECHANICAL: 2015 INTERNATIONAL MECHANICAL CODE (IMC)
4. ENERGY: 2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
5. GAS: 2012 NATIONAL FUEL GAS CODE
6. PLUMBING: 2015 NATIONAL STANDARD PLUMBING CODE WITH AMENDMENTS
9. ELECTRICAL: 2014 NATIONAL ELECTRIC CODE (NEC)
10.ACCESSIBILITY: 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN (2010 STANDARDS)
MARYLAND STATE ACCESSIBILITY CODE (COMAR.05.02.02)



1 / CA1.1 EGRESS FLOOR PLAN

SCALE: 1/32" = 1'-0"

32 16 0 16 32 48 64
SCALE FEET

TRUE NORTH — PLAN NORTH

NOTE: THIS EGRESS PLAN IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY TO INDICATE THE LOCATION OF ALL MAIN POINTS OF EGRESS FROM THE BUILDING'S LEVEL OF EXIT DISCHARGE. ALTHOUGH NO OCCUPANT LOAD OR EXIT CAPACITY CALCULATIONS WERE PERFORMED, NO INCREASE OR DECEASE IN OCCUPANT LOAD WILL RESULT FROM THESE MODIFICATIONS. SIMILARLY, THE IMPROVEMENTS FOR THE SECURITY VESTIBULE AT THE MAIN ENTRANCE WILL IN NO WAY COMPROMISE OR REDUCE THE EGRESS CAPACITY THROUGH THE MAIN ENTRANCE WHEN CONSIDERED AS A POINT OF EGRESS.

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FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

ISSUE

REV	DATE	DESCRIPTION
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PROJECT NO.: 15-30.04
DATE: 02-23-2018

CODE ANALYSIS & EGRESS FLOOR PLAN

CA1.1

TYPICAL DEMOLITION GENERAL NOTES:

1. AREAS OF DEMOLITION DENOTED BY DASHED LINES.
2. THE CONTRACTOR SHALL RETURN ALL SALVAGEABLE MATERIAL AND/OR EQUIPMENT NOTED TO BE REMOVED ON SHEET A1.1 TO THE OWNER. THE OWNER SHALL STORE SALVAGEABLE MATERIAL AND/OR EQUIPMENT AT THEIR DISCRETION. THE CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGEABLE MATERIALS IN ACCORDANCE WITH OWNER'S RECOMMENDATIONS AND LOCAL ZONING CODES.
3. THE CONTRACTOR SHALL CONSULT WITH THE ARCHITECT ON ANY CONCEALED CONDITIONS UNCOVERED DURING DEMOLITION THAT IMPEDES THE EXECUTION OF THE DESIGN AS INDICATED ON THE DRAWINGS.
4. ALL AREAS OF DEMOLITION SHALL BE PATCHED OR REPAIRED AS REQUIRED.
5. COORDINATE DEMOLITION WITH PROPOSED NEW CONSTRUCTION INCLUDING CEILINGS, LIGHTS, POWER, DATA, SPRINKLER HEADS, WALLS, DOORS, FRAMES, HARDWARE, FINISHES, CONCRETE SLABS, ETC.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE BUILDING AT ALL TIMES AND TO PROVIDE AND BE RESPONSIBLE FOR SHORING AND BRACING REQUIRED THROUGHOUT THE CONSTRUCTION PERIOD.
7. ANY ITEMS NOT NOTED TO BE DEMOLISHED, BUT REQUIRING REMOVAL IN ORDER TO ACCOMPLISH THE REQUIRED DEMOLITION WORK, SHALL BE REINSTALLED OR REPLACED IN KIND IN LOCATION DIRECTED BY OWNER UPON COMPLETION OF THE NEW CONSTRUCTION UNLESS OTHERWISE NOTED.
8. JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. ANY AREAS DAMAGED BY THE DEMOLITION AND/OR CONSTRUCTION WORK SHALL BE REPAIRED AND/OR RECEIVE NEW SUBSTRATES, FINISHES, AND/OR MATERIALS TO MATCH THE EXISTING AFFECTED ITEMS. ANY REPAIR OR REPLACEMENT WORK SHALL BE PERFORMED TO A LEVEL OF QUALITY EQUAL TO THAT FOUND PRIOR TO BEGINNING WORK ON THIS PROJECT.
10. THE SELECTIVE DEMOLITION AS SHOWN ON THE DRAWINGS IS DIAGRAMMATIC, AND IN NO WAY ATTEMPTS TO SHOW ALL EXISTING FIXTURES, CONNECTIONS AND FITTINGS, AND OTHER MISCELLANEOUS ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING/COORDINATING ALL MISCELLANEOUS DEMOLITION AS REQUIRED DUE TO FIELD CONDITIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL THE CONTAINMENT OF DUST AND DEBRIS DURING THE DEMOLITION PERIOD AND SHALL OBTAIN ALL REQUIRED PERMITS AND COORDINATE WITH THE CITY BUILDING DEPARTMENT THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. DAILY SITE CLEANING WILL BE REQUIRED WITH ADDITIONAL CLEANING IF REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
12. PRIOR TO BEGINNING DEMOLITION, THE CONTRACTOR SHALL SUBMIT TO THE OWNER A DEMOLITION PLAN OUTLINING THE DESIRED PLACEMENT OF DUMPSTERS, DUST AND DEBRIS CONTROL MEASURES AND SCHEDULE OF ACTIVITIES. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO EACH DEMOLITION ACTIVITY.
13. PROVIDE TEMPORARY COVER OR PARTITIONS TO PROTECT EXIST. BUILDING DURING CONSTRUCTION FROM EXPOSURE TO AND DAMAGE FROM THE ELEMENTS.
14. EXISTING FINISHES SPECIFICALLY NOT CALLED OUT TO BE REMOVED ARE TO REMAIN (PAINT, FLOORING, ETC.). PREPARE EXISTING SURFACES FOR APPLICATION OF NEW FINISHES AS REQUIRED BY MANUFACTURER RECOMMENDATIONS
15. SEE MECHANICAL, PLUMBING, & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION

SELECTIVE DEMOLITION NOTES:

1. REMOVE EXISTING HOLLOW METAL FRAME, DOOR, GLAZING AND ASSOCIATED HARDWARE (INCLUDING FLOOR AND WALL BUMPERS). PATCH AND REPAIR ALL ADJACENT SURFACES SHOWN TO REMAIN, UNLESS OTHERWISE NOTED.
2. REMOVE & SALVAGE EXISTING DISPLAY CASE, INCLUDING GLASS SHELVES, GLASS DOORS AND TRACK, LIGHT FIXTURES AND TRIM. REPAIR & PATCH ADJACENT SURFACES SHOWN TO REMAIN AND PREP TO RECEIVE NEW FINISHES. COORD. RELOCATION W/ FCPS.
3. REMOVE FULL HT. (UNLESS OTHERWISE NOTED) PORTION OF EXISTING NON-BEARING MASONRY, FURRING AND GYP. BD. WALL. PATCH AND REPAIR ADJACENT SURFACES AS REQUIRED TO MATCH EXIST. CONDITIONS.
4. REMOVE & SALVAGE EXISTING FURNISHINGS, INCLUDING DESKS AND SHELVING. REPAIR & PATCH ADJACENT SURFACES SHOWN TO REMAIN AND PREP TO RECEIVE NEW FINISHES. COORD. RELOCATION W/ FCPS. SEE ELECTRICAL DRAWINGS FOR NEW ASSOCIATED ELECTRIC.
5. EXIST. SECURITY MONITOR TO BE RELOCATED, SEE ELECTRICAL
6. REMOVE EXIST. CARPET AND PREP. SLAB TO RECEIVE NEW VCT.

DEMOLITION KEY:

- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- WALL TO BE REMOVED
- WINDOW TO BE REMOVED
- DOOR AND FRAME TO BE REMOVED

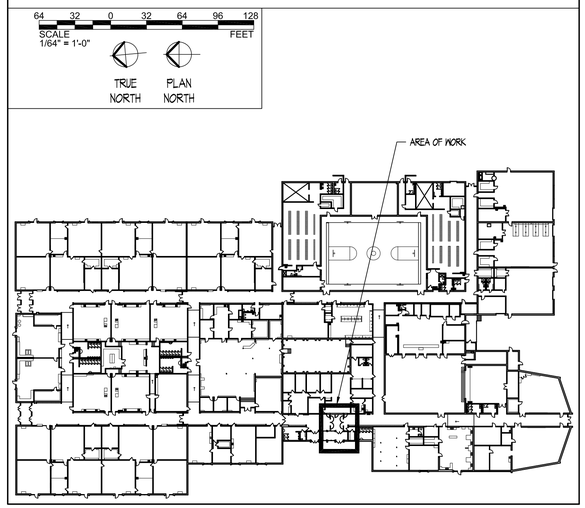
PROPOSED KEY:

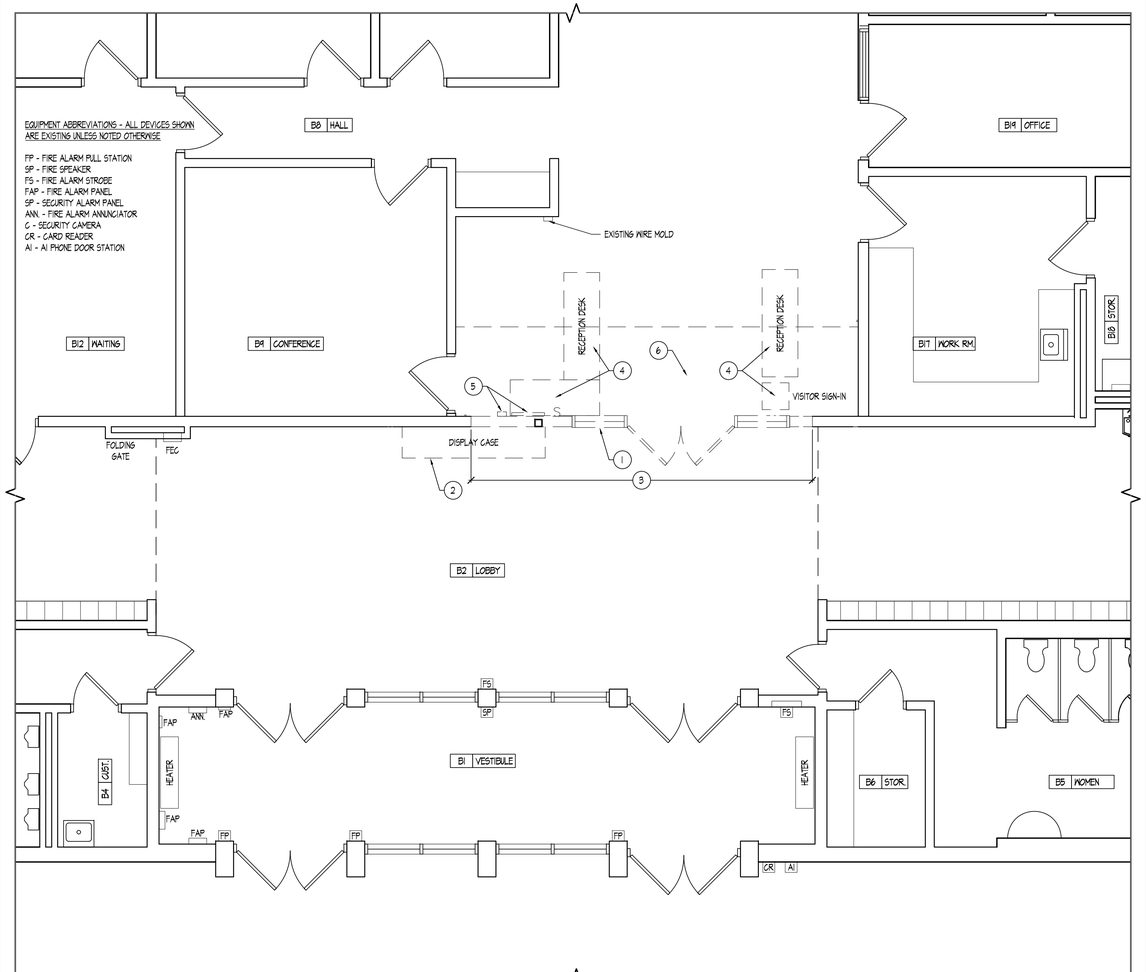
- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- NEW WALL
- NEW DOOR AND FRAME
- NEW STOREFRONT (SF)

NEW CONSTRUCTION GENERAL NOTES:

1. DIMENSIONS NOTED "CLR" (CLEAR) ARE NOT ADJUSTABLE WITHOUT APPROVAL FROM THE ARCHITECT.
2. IF CONFLICTS OCCUR BETWEEN DRAWING AND EXISTING FIELD CONDITIONS, THE GENERAL CONTRACTOR SHALL IMMEDIATELY CONTACT THE ARCHITECT FOR DIRECTION.
3. ALL NEW PARTITIONS SHOWN ABUTTING TO EXISTING COLUMNS OR WALLS SHALL ALIGN WITH FACE OF EXISTING FINISHED SURFACE UNLESS OTHERWISE NOTED IN THE DRAWINGS.
4. PATCH AND FINISH EXISTING AREAS DISTURBED BY CONSTRUCTION OF NEW ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND MECHANICAL WORKS. RESTORE AND REPAIR TO MATCH EXISTING ADJACENT AREA IN MATERIAL AND FINISH.
5. ALL PIPE AND CONDUIT PENETRATIONS THROUGH ANY FIRE RATED ASSEMBLIES SHALL BE FIRESTOPPED WITH TESTED UL RATED THROUGH PENETRATION FIRE STOP SYSTEMS BEARING THE REQUIRED RATINGS.

BUILDING KEY PLAN:

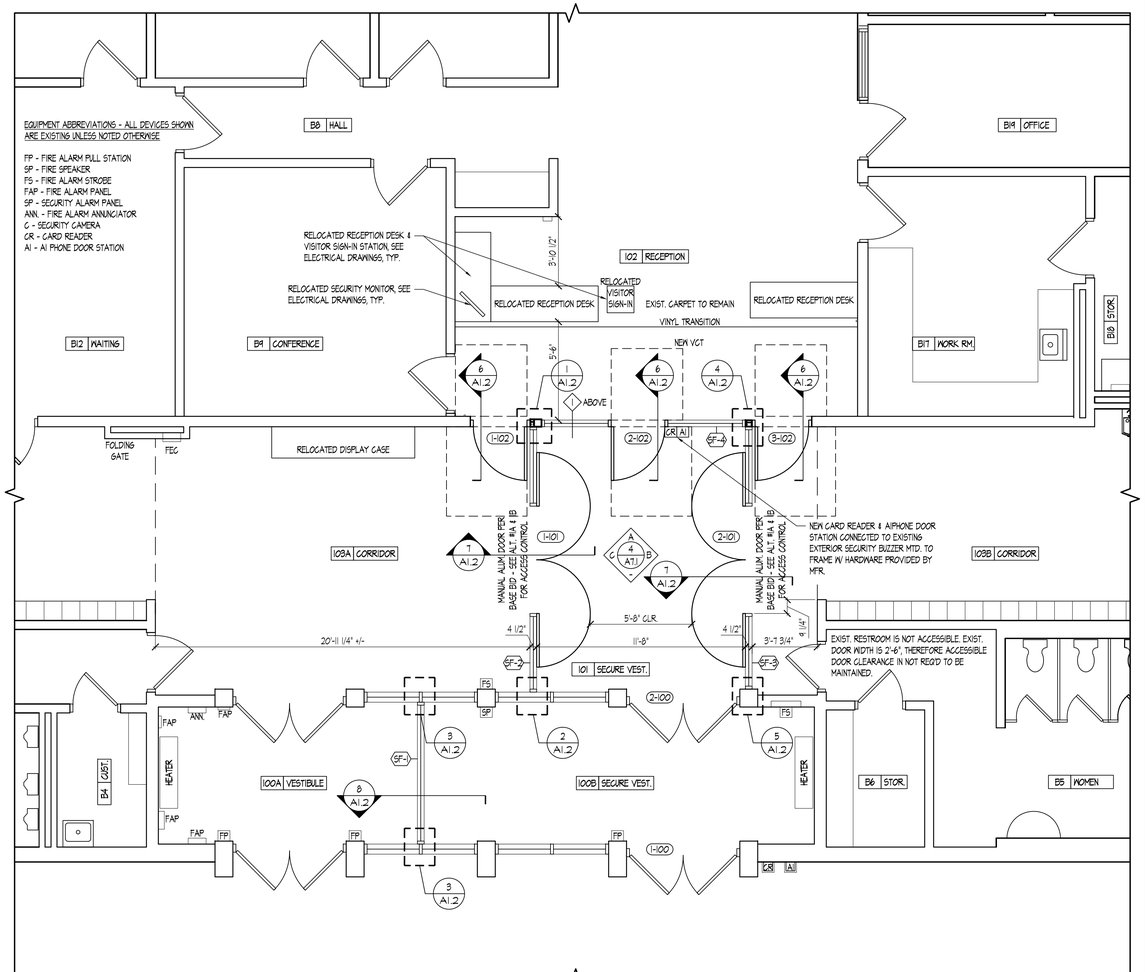




1 A1.1 **EXISTING / DEMOLITION FLOOR PLAN**

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8 SCALE FEET — TRUE NORTH — PLAN NORTH



2 A1.1 **PROPOSED FLOOR PLAN**

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8 SCALE FEET — TRUE NORTH — PLAN NORTH

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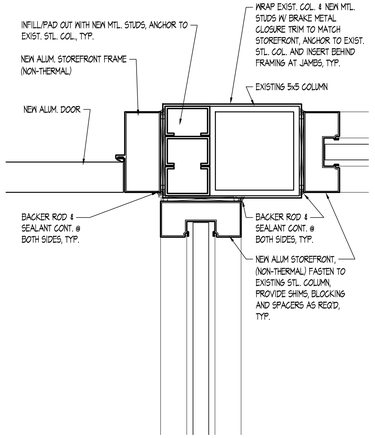
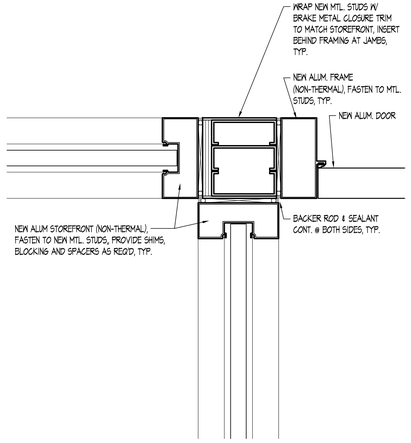
EXISTING / DEMOLITION & PROPOSED FLOOR PLANS

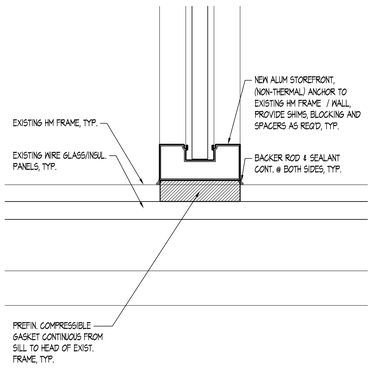
A1.1



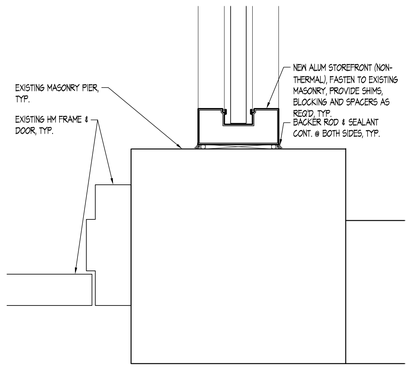
1 A1.2 **PLAN DETAIL**
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



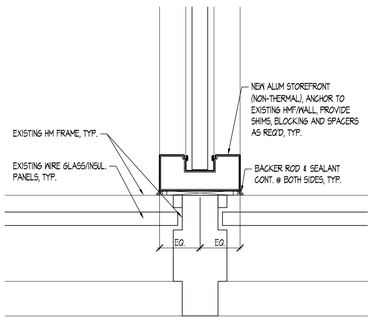
4 A1.2 **PLAN DETAIL**
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



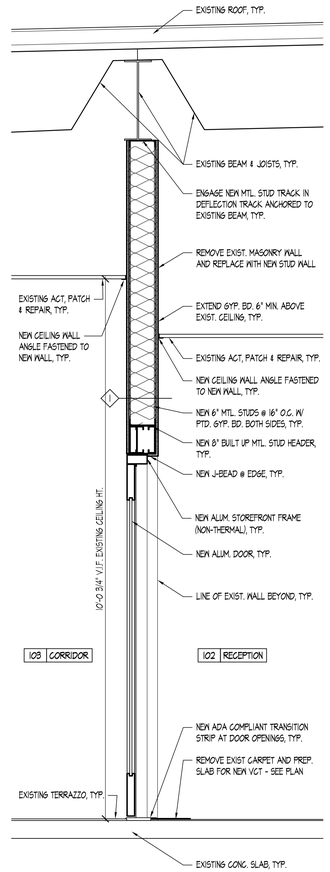
2 A1.2 **PLAN DETAIL**
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



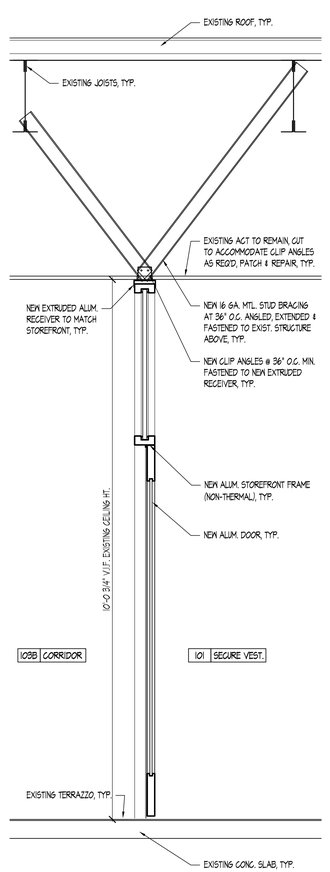
5 A1.2 **PLAN DETAIL**
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



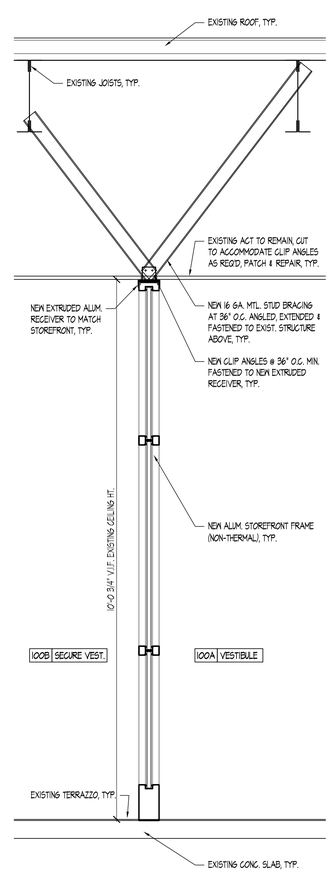
3 A1.2 **PLAN DETAIL**
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



6 A1.2 **WALL SECTION**
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



7 A1.2 **WALL SECTION**
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



8 A1.2 **WALL SECTION**
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET

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PROPOSED
PLAN DETAILS
& WALL SECTIONS

A1.2

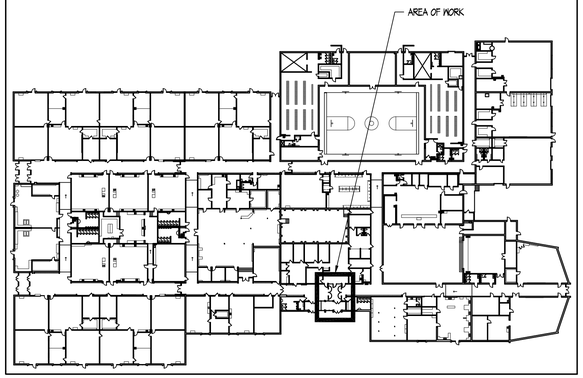
PROPOSED REFLECTED CEILING KEY:

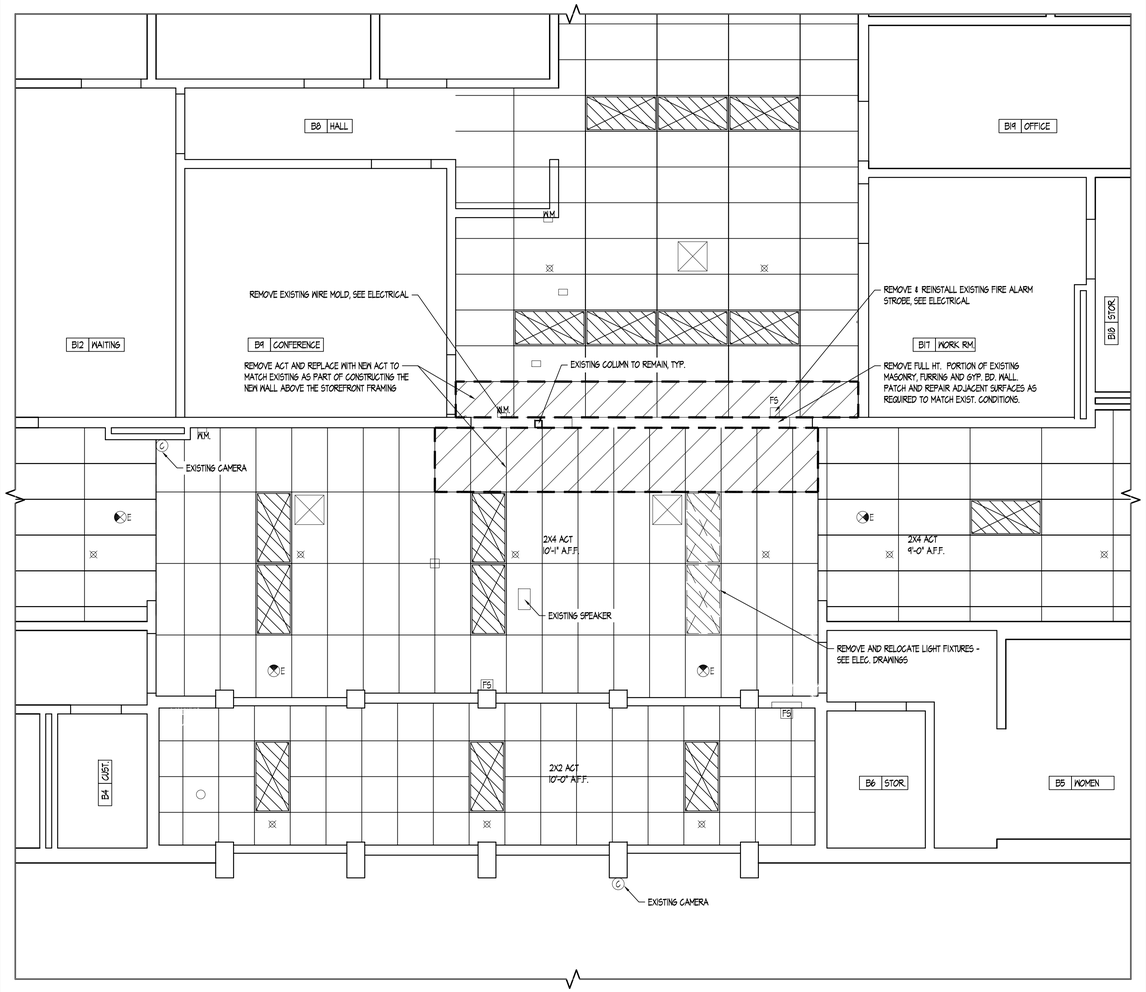
- EXISTING 2'-0" x 4'-0" CEILING GRID W/ NEW ACOUSTICAL CEILING TILE
- EXISTING 2'-0" x 4'-0" FLUORESCENT LIGHT FIXTURE TO REMAIN
- EXISTING 2'-0" x 4'-0" LIGHT FIXTURE TO BE REMOVED & SALVAGED FOR RE-USE
- RELOC. — SALVAGED EXISTING 2'-0" x 4'-0" LIGHT FIXTURE IN NEW LOCATION
- EXISTING RECESSED LIGHT FIXTURE TO REMAIN
- EXISTING DIFFUSER TO REMAIN
- MOVE EXISTING DIFFUSER TO NEW LOCATION
- E — EXISTING EXIT DEVICE
- N — NEW EXIT DEVICE
- EXISTING SPRINKLER HEAD

BUILDING KEY PLAN:

64 32 0 32 64 96 128
SCALE 1/64" = 1'-0" FEET

TRUE NORTH PLAN NORTH



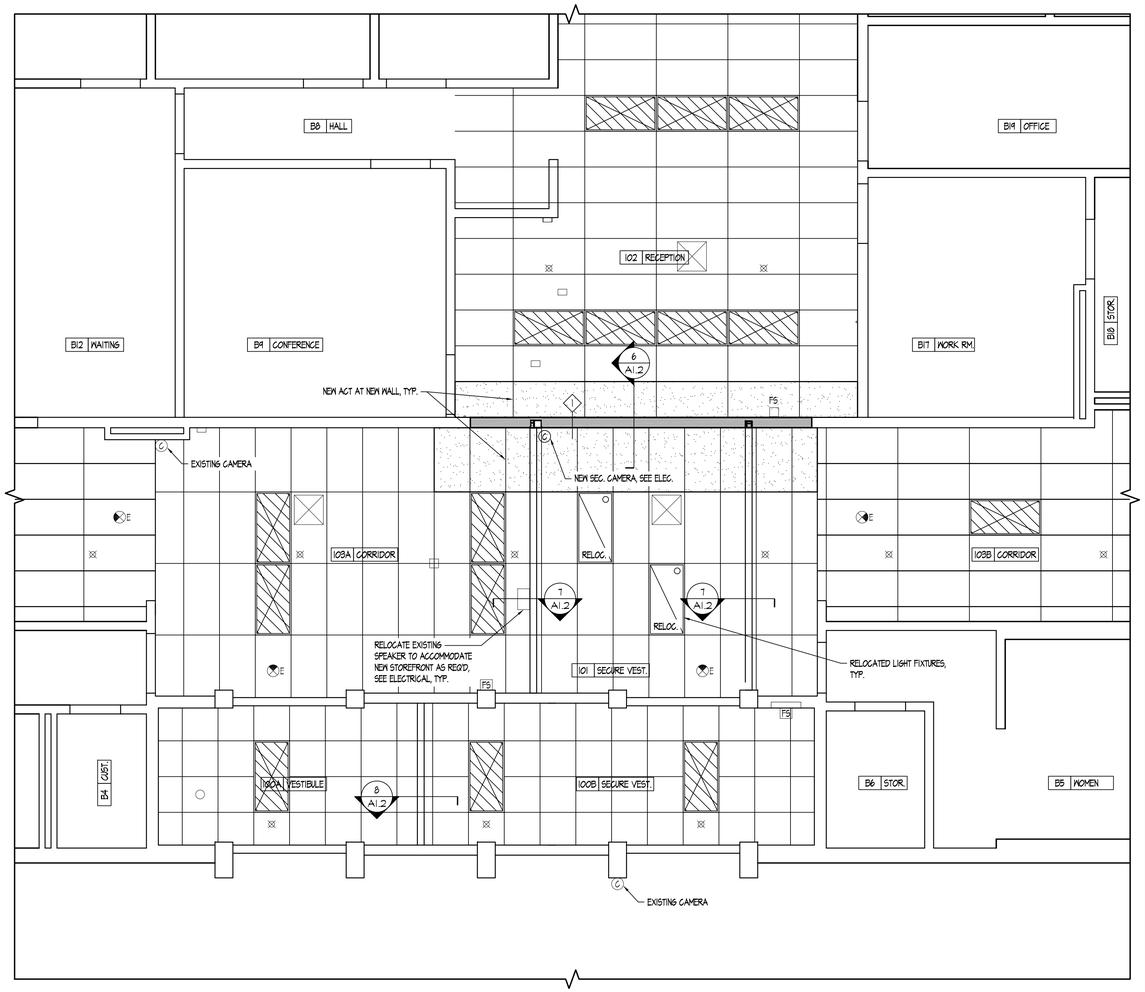


1 A6.1 **EXISTING / DEMOLITION REFLECTED CEILING PLAN**

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8
SCALE FEET

TRUE NORTH PLAN NORTH



2 A6.1 **PROPOSED REFLECTED CEILING PLAN**

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8
SCALE FEET

TRUE NORTH PLAN NORTH

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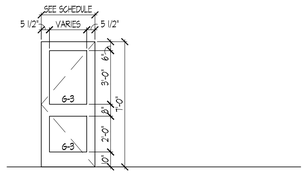
EXISTING / DEMO. & PROPOSED REFLECTED CEILING PLANS

A6.1

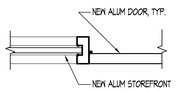


1

1 A7.1 DOOR TYPES

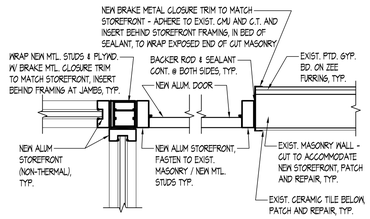
SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET



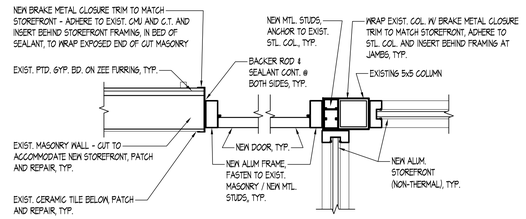
J - 1

ALUM. FRAME @ ALUM. STOREFRONT



J - 2

ALUM. FRAME @ ALUM. STOREFRONT & EXIST. MASONRY WALL



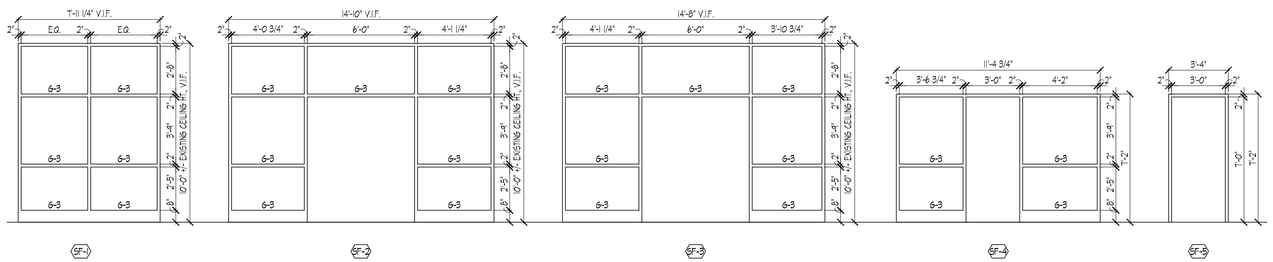
J - 3

HM FRAME @ EXIST. MASONRY WALL & NON-RATED 3-5/8" MTL. STUD WALL

2 A7.1 JAMB TYPES

SCALE: 1" = 1'-0"

SCALE 1 1/2 0 1/2 1 1-1/2 2 FEET

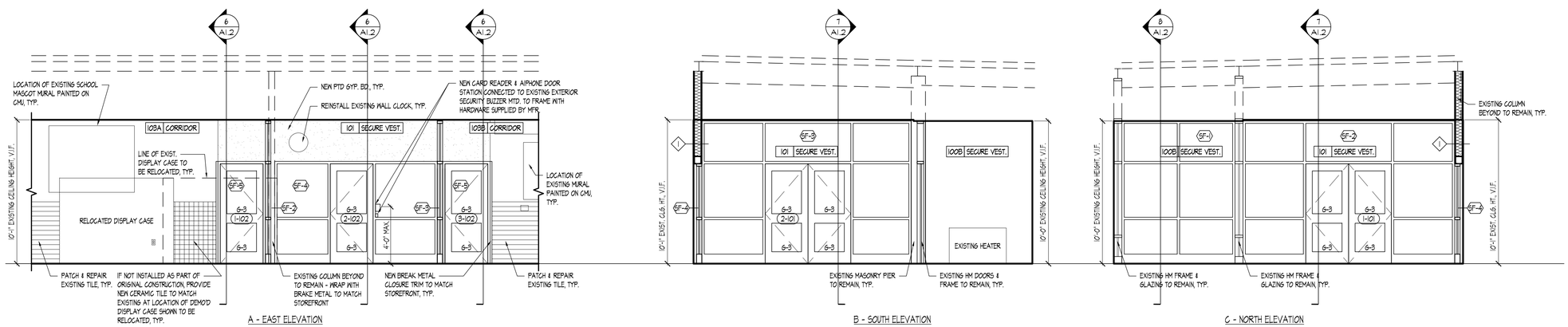


3

3 A7.1 STOREFRONT TYPES

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET



A - EAST ELEVATION

B - SOUTH ELEVATION

C - NORTH ELEVATION

4 A7.1 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET

DOOR SCHEDULE

OPENING NUMBER	SIZE			DOOR			FRAME			JAMB TYPE	HARDWARE SET	REMARKS
	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH			
1-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	HW #4	-
2-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	EXIST.	-
1-101	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-2	ALUM.	PREFIN.	J - 1	HW # 1 * (BASE BID)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALTERNATE #1B
2-101	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-3	ALUM.	PREFIN.	J - 1	HW # 1 * (BASE BID)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALTERNATE #1B
1-102	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-5	ALUM.	PREFIN.	J - 3	HW # 3	-
2-102	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-4	ALUM.	PREFIN.	J - 1	HW # 2	-
3-102	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-5	ALUM.	PREFIN.	J - 2	HW # 3	-

* BASE BID - SECURED NON-ELECTRIFIED HARDWARE
ADD ALT. #1A - ELEC. LATCH RETRACTION TIMED WITH GLASS CHANGES
ADD ALT. #1B - ELEC. LATCH RETRACTION TIMED WITH GLASS CHANGES AND ACTIVATED BY CARD READER

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOORS		WALLS								CEILING		REMARKS
				NORTH		EAST		SOUTH		WEST				
		MATERIAL	BASE	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	HEIGHT	
100A	VESTIBULE	EXIST.	EXIST.	EXIST.	-	EXIST.	-	SF-1	PREFIN.	EXIST.	-	EXIST.	-	-
100B	SECURE VESTIBULE	EXIST.	EXIST.	SF-1	PREFIN.	EXIST.	-	EXIST.	-	EXIST.	-	EXIST.	-	-
101	SECURE VESTIBULE	EXIST.	EXIST.	SF-2	PREFIN.	GYP. BD. / SF-4	PTD-1 / PREFIN.	SF-3	PREFIN.	EXIST.	-	EXIST. *	-	* REPLACE CLG. TILES TO MATCH EXIST. @ NEW EAST WALL
102	RECEPTION	EXIST. / VCT-1 **	EXIST. / RB-1 **	EXIST.	-	EXIST.	-	EXIST.	-	EXIST./ GYP. BD./ SF-445	PTD-1 / PREFIN.	EXIST. **	-	** PATCH & REPAIR EXISTING CEILING, VCT/BASE @ NEW STOREFRONT
103A	CORRIDOR	EXIST.	EXIST.	EXIST.	-	EXIST. / GYP. BD. / SF-5	PTD-1 / PREFIN.	SF-2	PREFIN.	EXIST.	-	EXIST.	-	-
103B	CORRIDOR	EXIST.	EXIST.	SF-3	PREFIN.	EXIST./ GYP. BD./ SF-5	PTD-1/ PREFIN.	EXIST.	-	EXIST.	-	EXIST.	-	-

FINISH SELECTIONS SCHEDULE

TYPE	ABBR.	FINISH	SELECTION	REMARKS
FLOORING	VCT-1	VINYL COMPOSITE TILE	SEE SPECIFICATIONS	MATCH EXISTING USING ATTIC STOCK
BASE	RB-1	RUBBER BASE	SEE SPECIFICATIONS	MATCH EXISTING ROPPE 4" BASE USING ATTIC STOCK
WALL	PTD-1	TYPICAL WALL PAINT	SEE SPECIFICATIONS	MATCH EXISTING PAINT USING ATTIC STOCK
CEILING	ACT-1	ACOUSTICAL CEILING TILE	SEE SPECIFICATIONS	MATCH EXISTING ARMSTRONG TILE USING ATTIC STOCK

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I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE No. 14510
EXPIRATION DATE 03-07-2020

NEW SECURITY VESTIBULE RENOVATIONS FOR:
MONOCACY MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.04
DATE: 02-23-2018

SCHEDULES & TYPES

A7.1

HVAC ABBREVIATIONS

AHJ	AUTHORITY HAVING JURISDICTION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
CFM	CUBIC FEET PER MINUTE
DIFF	DIFFUSER
ETC	ETCETERA
EXIST	EXISTING
HORIZ	HORIZONTAL
NTS	NOT TO SCALE
SA	SUPPLY AIR
SCH	SCHEDULE
SPEC	SPECIFICATION
SQ FT	SQUARE FEET
SUP	SUPPLY
TAB	TEST, ADJUST AND BALANCE
T'STAT	THERMOSTAT
UNO	UNLESS NOTED OTHERWISE

HVAC SYMBOLS

(T)	THERMOSTAT
	CONNECTION POINT - NEW TO EXISTING
	DISCONNECTION POINT
(X)	NUMBERED NOTES
X	REVISION SEQUENCE
S1 (2) 200	TAG (THROWS) AIRFLOW — GRILLE, REGISTER AND DIFFUSER TAG
	SUPPLY DIFFUSER - 4-WAY BLOW

PROJECT GENERAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS AND APPLICABLE CODES AND REGULATIONS.
4. THE LOCATION OF EXISTING EQUIPMENT AND UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
6. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
7. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.
8. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
9. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
10. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 26 OF THE SPECIFICATION.
11. WHEN MECHANICAL WORK IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDED A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
12. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
13. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT SUPPORTED FROM A METAL DECK.
14. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING EQUIPMENT AND UTILITIES BEFORE COMMENCING WORK.

SHEET METAL GENERAL NOTES

1. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
2. COORDINATE DIFFUSERS, REGISTER AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:45511, Expiration Date: 06/03/2018

STATE OF MARYLAND · CHRISTOPHER J. CLARK · 45511 · PROFESSIONAL ENGINEER

NEW SECURITY VESTIBULE RENOVATIONS FOR:
MONOCACY MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

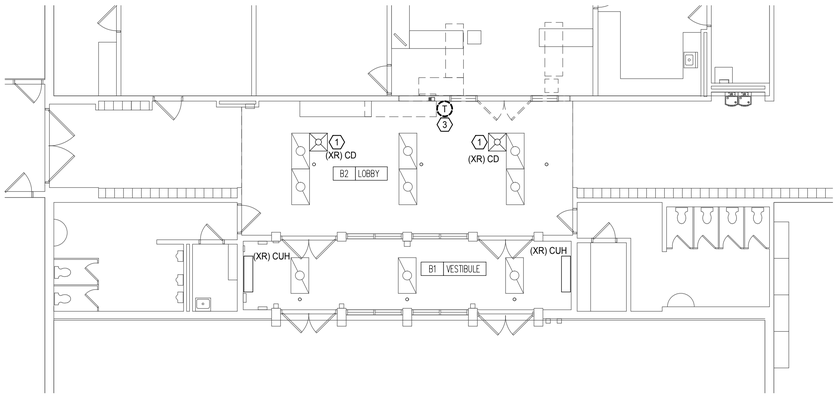
ISSUE

REV	DATE	DESCRIPTION

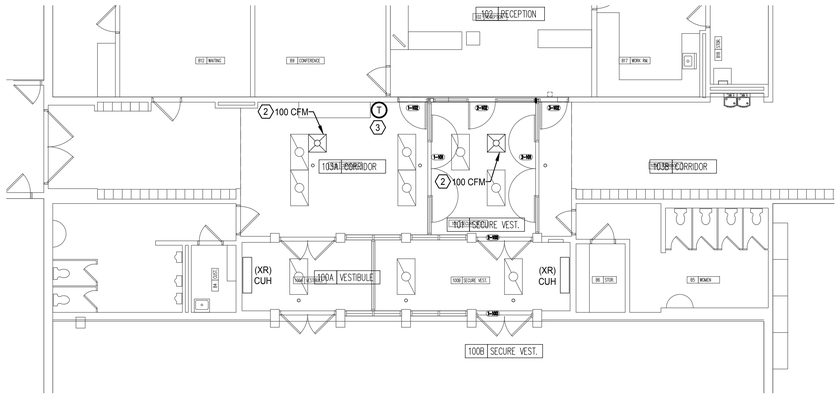
PROJECT NO.: 17-0670
DATE: 5-17-2018

SYMBOLS, ABBREVIATIONS & NOTES

M001



1 M-101 **PART FIRST FLOOR PLAN - DEMOLITION - MECHANICAL**
1/8" = 1'-0"



2 M-101 **PART FIRST FLOOR PLAN - NEW WORK - MECHANICAL**
1/8" = 1'-0"

NUMBERED NOTES:

1. PROVIDE PRE-DEMOLITION TESTING OF EXISTING SUPPLY AIR.
2. BALANCE EXISTING AIR DEVICE TO INDICATED AIRFLOW.
3. RELOCATE EXISTING THERMOSTAT. EXTEND THERMOSTAT WIRE TO NEW LOCATION. REFER TO NEW WORK SECTION FOR NEW LOCATION.

GENERAL NOTES:

G1: REVISE/EXTEND EXISTING WET SPRINKLER PIPE. MODIFY, RELOCATE PIPE, ADD HEADS AS NECESSARY TO ACCOMMODATE RENOVATION AS REQUIRED. PROVIDE SPRINKLER DRAWING TO FIRE MARSHAL, INSTALL PER NFPA 13 AND COORDINATE INSTALLATION WITH LOCAL FIRE MARSHAL. COORDINATE/VERIFY EXACT LIMITS OF AREA AFFECTED TO BE REVISED WITH ARCHITECTURAL DRAWINGS.

8 4 0 4 8 12 16
SCALE FEET

TRUE NORTH PLAN NORTH

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License No:45511, Expiration Date: 06/03/2018

STATE OF MARYLAND · CHRISTOPHER P. CARLSON · 45511 · PROFESSIONAL ENGINEER

NEW SECURITY VESTIBULE RENOVATIONS FOR:
MONOCACY MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

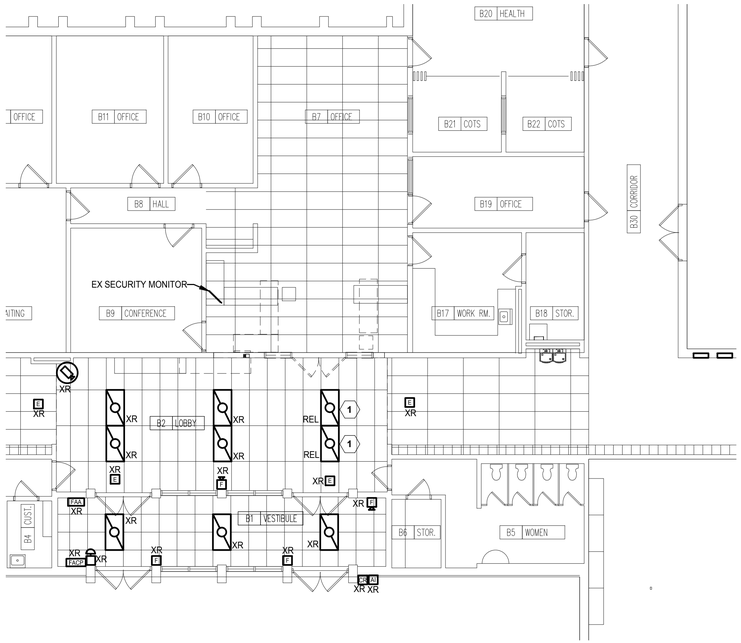
ISSUE

REV	DATE	DESCRIPTION

PROJECT NO.: 17-0670
DATE: 5-17-2018

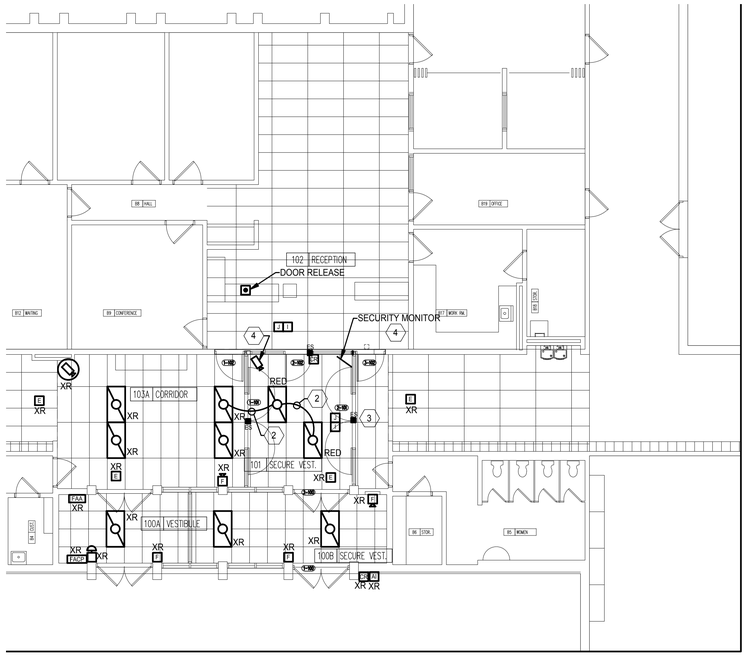
PART FIRST FLOOR PLAN - DEMOLITION AND NEW WORK

M101



1 E101 **PART FLOOR PLAN - DEMOLITION - ELECTRICAL**

1/8" = 1'-0"



2 E101 **PART FLOOR PLAN - NEW WORK - ELECTRICAL**

1/8" = 1'-0"

NUMBERED NOTES:

1. EXISTING FIXTURE SHALL BE DISCONNECTED AND REMOVED FOR RELOCATION.
2. RELOCATED FIXTURE, RECONNECTED TO EXISTING CIRCUIT.
3. DOORS SHALL BE CONTROLLED VIA DOOR RELEASE AND TIMER. COORDINATE WITH SCHOOL FOR ALL SETTINGS.
4. PROVIDE CAMERA AND MONITOR ACCORDING TO FCPS REQUIREMENTS AND CONNECT TO EXISTING SYSTEM.

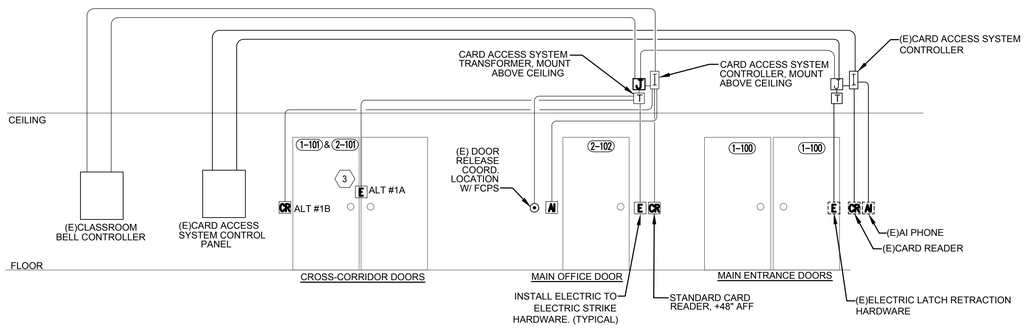
PROJECT DIRECTIVE:

MAIN OFFICE
BASE BID:
PROVIDE ELECTRONIC ACCESS INTO THE MAIN OFFICE FROM THE NEW SECURITY VESTIBULE. BASE BID TO INCLUDE:

a. CARD READER ON THE NEW SECURITY VESTIBULE SIDE FOR ACCESS INTO MAIN OFFICE
b. AI PHONE ON THE NEW SECURITY VESTIBULE SIDE WIRED AND CONNECTED TO THE EXTERIOR AI PHONE FOR THE OPERATION OF DOOR RELEASE OF BOTH DOORS.

CROSS-ORRIDORS
ALTERNATE #1A:
PROVIDE ELECTRONIC HARDWARE AT EACH PAIR OF CROSS CORRIDOR DOORS FOR THE PURPOSES OF PROGRAMMING VIA THE FCPS SECURITY SYSTEM. THE LOCKING AND UNLOCKING OF DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. HARDWARE WILL INCLUDE CONCEALED ROD WITH ELECTRIC RETRACTION.

ALTERNATE #1B:
ENHANCE ALTERNATE #1A BY ADDING CARD READERS AT EACH PAIR OF CROSS CORRIDOR DOORS.



CARD ACCESS SYSTEM RISER

NO SCALE

POWER

- EXISTING PANELBOARD
- J — JUNCTION BOX
- J — JUNCTION BOX - CEILING
- EMERGENCY POWER OFF PUSH BUTTON

SECURITY & DOOR CONTROL

- SSCP — SECURITY SYSTEM CONTROL PANEL
- SECURITY CAMERA
- SECURITY CAMERA IN BUBBLE
- CR — CARD READER
- AI — AIPHONE DOOR STATION
- PUSH-BUTTON
- DC — DOOR CONTACT
- ES — ELECTRIC STRIKE
- EML — ELECTROMAGNETIC DOOR LOCK
- ELECTROMAGNETIC DOOR HOLDER

EXISTING CONDITIONS/ DEMOLITION NOTES:

D1. CONDUITS & WIRING REQUIRED FOR THE CONTINUITY OF LIGHTING, OUTLETS, SYSTEMS AND EQUIPMENT THAT IS TO REMAIN SHALL REMAIN UNDISTURBED OR SHALL BE RECONNECTED BY THE CONTRACTOR AS REQUIRED TO MAINTAIN SERVICE. THIS WORK SHALL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.

D2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED AT THE SITE BY THE ELECTRICAL CONTRACTOR, PRIOR TO PRICING.

D3. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE REMOVED, THE EC SHALL REMOVE THE EQUIPMENT AND AND ALL ASSOCIATED WIRING AND CONDUITS BACK TO THE SERVICE POINT.

D4. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE RELOCATED, THE EC SHALL RELOCATE THE EQUIPMENT AS SHOWN ON THE PLANS AND RECONNECT THE EQUIPMENT AS REQUIRED TO MAINTAIN SERVICE. PATCH ALL OPENINGS IN THE WALL, CEILINGS, OR FLOORS CREATED BY THE DEMOLITION WORK.

D5. CONDUITS AND WIRING MADE OBSOLETE DUE TO NEW CONSTRUCTION SHALL BE REMOVED IN IT'S ENTIRETY, BACK TO THE SERVICE POINT.

D6. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR THE LIMITS OF DEMOLITION WORK.

D7. REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT LOCATIONS OF THE MECHANICAL EQUIPMENT THAT WILL BE DISCONNECTED.

LIGHTING

- LIGHTING FIXTURE - SEE FIXTURE SCHEDULE FOR MORE INFORMATION
- E — EXIT SIGN - DIRECTIONAL ARROWS AS INDICATED ON DRAWINGS

MISCELLANEOUS

- BRANCH CIRCUIT WIRING CONCEALED IN WALLS OR ABOVE CEILING
- BRANCH CIRCUIT WIRING - #10 AWG
- BRANCH CIRCUIT WIRING - UNDER FLOOR
- HOME RUN BACK TO PANEL
- LV — LOW VOLTAGE WIRING AND CONDUIT
- INDICATES CONTINUATION OF LINE

FIRE ALARM

- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR PANEL
- F — FIRE ALARM PULL STATION
- F — FIRE ALARM STROBE - WALL MOUNTED
- F — FIRE ALARM HORN/STROBE - WM
- FA — FIRE ALARM AUDIBLE AND VISIBLE - CM
- FS — FIRE ALARM STROBE - CM

DENOTATIONS & ABBREVIATIONS

EC	ELECTRICAL CONTRACTOR
F	FIRE ALARM
GC	GENERAL CONTRACTOR
LV	LOW VOLTAGE
M	MOTOR
MC	MECHANICAL CONTRACTOR
PRN	PRESENT LOCATION/ REPLACED WITH NEW
REL	RELOCATE
RED	RELOCATED
SEC	SECURITY SYSTEM
XR	EXISTING TO REMAIN

GENERAL PROJECT NOTES:

G1. UNLESS OTHERWISE NOTED, PROVIDE ALL EQUIPMENT SHOWN ON THE PLANS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SYMBOLS SHOWN ON THE PLANS WITH THE SYMBOL LIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INTENT OF ANY SYMBOL THAT IS SHOWN ON THE PLANS AND NOT INDICATED ON THE SYMBOL LIST WITH ELECTRICAL ENGINEER.

G2. COORDINATE THE FINAL LOCATIONS OF ALL LIGHT FIXTURES WITH THE ARCHITECTS REFLECTED CEILING PLANS. REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO INSTALLATION.

G3. THE CONTRACTOR SHALL COORDINATE CONDUIT RUNS, CABLE TRAY, LIGHTING FIXTURES AND OTHER EQUIPMENT LOCATIONS WITH THE OTHER TRADE CONTRACTORS TO AVOID CONFLICTS.

SCALE 8 4 0 4 8 12 16 FEET

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:45511, Expiration Date: 06/03/2018

STATE OF MARYLAND · CHRISTOPHER J. CLARK · 45511 · PROFESSIONAL ENGINEER

NEW SECURITY VESTIBULE RENOVATIONS FOR:
MONOCACY MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
8009 OPOSSUMTOWN PIKE
FREDERICK, MARYLAND 21702

ISSUE

REV	DATE	DESCRIPTION

PROJECT NO.: 17-0670
DATE: 5-17-2018

PART FLOOR PLAN - DEMOLITION AND NEW WORK - ELECTRICAL

E101

PROJECT INFORMATION

NEW SECURITY VESTIBULE RENOVATIONS FOR:

BALLENGER CREEK MIDDLE SCHOOL

FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

CONTACT LIST

OWNER:

FREDERICK COUNTY PUBLIC SCHOOLS
191 SOUTH EAST STREET
FREDERICK, MD 21701
TEL. : (301)-644-5000

ARCHITECT:

PROFFITT & ASSOCIATES ARCHITECTS, PC
49 SOUTH CARROLL STREET
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MECH. / ELEC. ENGINEER :

CJL ENGINEERING INC.
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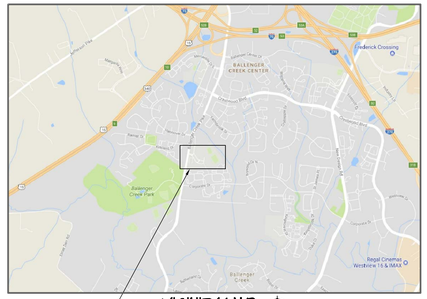
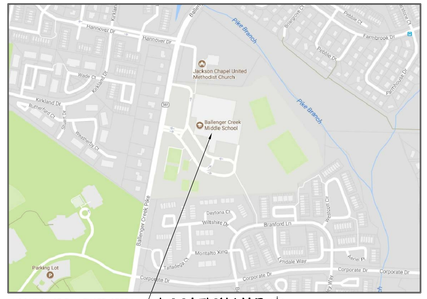
GENERAL NOTES

1. BIDDERS SHALL CAREFULLY EXAMINE THE PERMIT DOCUMENTS, ACQUAINT THEMSELVES WITH ALL GOVERNING LAWS AND CODES, VISIT THE SITE AND THOROUGHLY FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS BEFORE SUBMITTING BIDS.
2. ALL WORK DESCRIBED WITHIN THE CONTRACT DOCUMENTS SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, INCLUDING BUT NOT LIMITED TO, THE CURRENT BUILDING CODE, LIFE SAFETY CODE, ADAAG, AS WELL AS ORDINANCES AND REGULATIONS AND OTHER BUILDING CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND WARRANTY REQUIREMENTS.
4. INDIVIDUAL SUBCONTRACTORS FOR ANY PLUMBING, ELECTRICAL, AND MECHANICAL WORK SHALL OBTAIN ALL NECESSARY PERMITS, INSPECTIONS, ETC., AND PERFORM ALL WORK IN CONFORMANCE TO ALL LOCAL CODES.
5. DISTURB AS SMALL AN AREA OF THE SITE AS POSSIBLE DURING CONSTRUCTION OPERATIONS UNLESS OTHERWISE NOTED, PREPARE AND SEED DISTURBED AREAS AT THE COMPLETION OF THE PROJECT.
6. REPAIR ALL AREAS DISTURBED BY THE WORK OF THIS PROJECT, INCLUDING SUBSTRATES OR STRUCTURAL REPAIRS, AND REPAIRS TO FINISHES TO MATCH AND ALIGN WITH EXISTING FINISHES TO REMAIN OR NEW FINISHES INSTALLED.
7. THE JOB SITE IS TO BE LEFT CLEAN AND FREE FROM DEBRIS AT ALL TIMES.
8. UNLESS OTHERWISE NOTED, ALL WORK IS CONSIDERED TO BE NEW CONSTRUCTION.
9. CONTRACTOR TO PROTECT ALL EXISTING UNDERGROUND UTILITIES AND VERIFY LOCATION PRIOR TO ANY EXCAVATION.
10. CONTRACTOR SHALL PROVIDE ALL NECESSARY SHORING, BRACING, AND TAKE OTHER PRECAUTIONS NECESSARY FOR SAFETY AS REQUIRED BY CODE AND PRACTICE.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY BLOCKING, CONCEALED WITHIN THE WALLS, FOR ATTACHMENT OF SURFACE AND/OR RECESSED MOUNTED EQUIPMENT OR ACCESSORIES, WHETHER SHOWN IN THE DRAWINGS OR NOT. BLOCKING TO BE FIRE RETARDANT.
12. CONTRACTOR SHALL SUPPLY ALL NECESSARY ANCHORS, TIES, CLIPS, HANGERS, BOLTS, AND OTHER FASTENING DEVICES AS REQUIRED BY CODE AND GOOD PRACTICE.
13. CONTRACTOR SHALL PROVIDE SEALANT AROUND WINDOWS, DOOR JAMBS AND HEADS, AND ADJACENT CONSTRUCTION.
14. PART OF THIS WORK MAY INCLUDE THE INSTALLATION AND/OR MODIFICATION OF A SPRINKLER SYSTEM IN AN EXISTING BUILDING. CONTRACTOR IS RESPONSIBLE TO CONCEAL ALL NEW PIPING WITHIN EXISTING CONSTRUCTION AND MAKE REPAIRS AS NECESSARY TO MATCH EXISTING OR NEW FINISHES.
15. PRIOR TO MODIFICATION OR ADDITION OF SPRINKLER IN EXISTING BUILDING, SUBCONTRACTOR TO CONFIRM FINAL CEILING HEIGHT WITH CONTRACTOR DUE TO JOB CONDITIONS.
16. EXISTING BUILDING INFORMATION IS BASED ON INFORMATION PROVIDED BY OTHERS AND PROFFITT & ASSOCIATES ARCHITECTS' FIELD SURVEYS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD PRIOR TO SUBMITTING SHOP DRAWINGS, AND BEFORE CONSTRUCTION AND FABRICATION OF MATERIALS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES FROM THE INFORMATION PROVIDED IN A TIMELY MANNER.
17. DRAWING INTENT IS TO INDICATE GENERAL ARRANGEMENT, DESIGN AND INTENT OF WORK AND IS PARTIALLY DIAGRAMMATIC. IT SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS, INCLUDING CONSTRUCTION OR FABRICATION. ALL DIMENSIONS FOR BUILT-IN ITEMS SHALL BE BASED ON FIELD DIMENSIONS. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF DIMENSIONS.
18. DIMENSIONS, NOTES, FINISHES AND FIXTURES SHOWN ON TYPICAL PLANS, SECTIONS OR DETAILS SHALL APPLY TO SIMILAR, SYMMETRICAL, OR OPPOSITE PLANS, SECTIONS OR DETAILS.
19. SEE WALL TYPE NOTES FOR ADDITIONAL INFORMATION REGARDING TYP. WALL TYPES.
20. REFER TO THE GENERAL SPECIFICATIONS.

VICINITY & LOCATION MAP



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

LEGEND

- BRICK
- CMU
- CONCRETE
- FINISHED WOOD
- ROUGH WOOD
- PLYWOOD
- METAL
- GYPSUM BOARD
- RIGID INSULATION
- BATT INSULATION
- (12) WINDOW OPENING
- (1-202) DOOR / FRAME SEE SCHEDULE
- 3042 | ROOM NAME / 5F — ROOM NAME, ROOM NUMBER
- (12) / (G) — COLUMN REFERENCE
- 5 / A5.2 — DETAIL NUMBER, SHEET TO LOCATE DETAIL
- 1 / A3.1 — DIRECTION OF VIEW, ELEVATION NUMBER, SHEET TO LOCATE ELEVATION
- 2 / A4.1 — DIRECTION OF CUTTING PLANE, SECTION NUMBER, SHEET TO LOCATE SECTION
- EXTENT OF SECTION CUT
- (2) WALL TYPE
- (2) WALL TYPE, FIRE-RATED
- (3) REVISION NOTE
- (N) KEY NOTE
- FIN. FLR. + HEIGHT INDICATOR (ABOVE FINISHED FLOOR, ABOVE SEA LEVEL)
- INTERIOR ELEVATION KEY: A, B, C, D; A&B — ELEVATION INDICATOR, SHEET TO LOCATE ELEVATION, DIRECTION OF VIEW

ABBREVIATIONS

∠	ANGLE	JAN.	JANITOR
ACOUS.	ACOUSTIC	JT.	JOINT
ACT	ACOUSTICAL CEILING TILE	LAM.	LAMINATE
A.D.	AREA DRAIN	LAV.	LAVATORY
ADJ.	ADJUSTABLE	LIN. FT.	LINEAR FEET
A.F.F.	ABOVE FINISHED FLOOR	LG.	LONG
AIR COND.	AIR CONDITIONING	L.L.H.	LONG LEG HORIZONTAL
ALT.	ALTERNATE	L.L.V.	LONG LEG VERTICAL
ALUM.	ALUMINUM		
ANCH.	ANCHORED	MAS.	MASONRY
A.P.	ACCESS PANEL	MATL.	MATERIAL
APPROX.	APPROXIMATE	MAX.	MAXIMUM
ARCH.	ARCHITECT	MECH.	MECHANICAL
		MFGR.	MANUFACTURER
BD.	BOARD	MIN.	MINIMUM
BIT.	BITUMINOUS	MISC.	MISCELLANEOUS
BLDG.	BUILDING	M.O.	MASONRY OPENING
BLK'G	BLOCKING	MTD.	MOUNTED
B.O.F.	BOTTOM OF FOOTING	MTL.	METAL
BOT.	BOTTOM		
BRG.	BEARING	NAT.	NATURAL
		N.I.C.	NOT IN CONTRACT
℄	CENTER LINE	NO.	NUMBER
CAB.	CABINET	NOM.	NOMINAL
C.J.	CONSTRUCTION JOINT	N.T.S.	NOT TO SCALE
CLG.	CEILING		
CLG. HT.	CEILING HEIGHT	OA.	OVERALL
CLO.	CLOSET	O/C	ON CENTER
CLR.	CLEAR	O.D.	OUTSIDE DIMENSION
CMU	CONCRETE MASONRY UNIT	OH.	OVERHANG
CNTRL. JT.	CONTROL JOINT	O/O	OUT TO OUT
C.O.	CLEAN OUT	OPG.	OPENING
COL.	COLUMN	OPP.	OPPOSITE
CONC.	CONCRETE		
CONT.	CONTINUOUS	PSB	PAINTED GYPSUM BOARD
CORR.	CORRIDOR	PL. P.	PLATE
C.T.	CERAMIC TILE	PLAS. LAM.	PLASTIC LAMINATE
CTR.	CENTER	PLYWD.	PLYWOOD
		POL.	POLISHED
⌀	DIAMETER	PREFAB.	PREFABRICATED
DBL.	DOUBLE	PREFIN.	PREFINISHED
D.F.	DRINKING FOUNTAIN	PR.	PAIR
DIA	DIAMETER	P.T.	PRESSURE TREATED
DIM.	DIMENSION	PTD.	PAINTED
DR.	DOOR	P.V.C.	POLYVINYL CHLORIDE
DN.	DOWN		
DS.	DOWNSPOUT	R.	RISERS
DTL.	DETAIL	RD.	ROOF DRAIN
DWG.	DRAWING	RECEPT.	RECEPTACLE
		REINF.	REINFORCING
EA.	EACH	REQ'D	REQUIRED
E.J.	EXPANSION JOINT	REV.	REVISED
EL., ELEV.	ELEVATION	RM.	ROOM
ELEC.	ELECTRIC	R.O.	ROUGH OPENING
EQ.	EQUAL		
EQUIP.	EQUIPMENT	SCHED.	SCHEDULE
E.W.	EACH WAY	SECT.	SECTION
E.W.C.	ELECTRIC WATER COOLER	SHT.	SHEET
EX., EXIST.	EXISTING	SIM.	SIMILAR
EXP.	EXPANSION	S.M.P.	SOLID MASONRY PIER
EXT.	EXTERIOR	SPECS.	SPECIFICATIONS
F.D.	FLOOR DRAIN	SQ.	SQUARE
F.E.	FIRE EXTINGUISHER	ST. STL.	STAINLESS STEEL
F.E.C.	FIRE EXTINGUISHER CABINET	STD.	STANDARD
FIN.	FINISH	STL.	STEEL
FL., FLR.	FLOOR	STOR.	STORAGE
FLUOR.	FLUORESCENT	STRUCT.	STRUCTURAL
F.O.E.X.	FACE OF EXISTING	SUSP.	SUSPENDED
FURR.	FURRING/FURRED	SYM.	SYMMETRICAL
FT.	FOOT/FEET		
FTG.	FOOTING	T.	TREAD
		T&G	TONGUE & GROOVE
GA.	GAUGE	TEL.	TELEPHONE
GALV.	GALVANIZED	THK.	THICKNESS
G.C.	GENERAL CONTRACTOR	THRU.	THROUGH
GL.	GLASS	T.O.S.	TOP OF SLAB
GRD.	GRADE	T.O.STL.	TOP OF STEEL
GYP. BD., GWB	GYPSUM WALL BOARD	TYP.	TYPICAL
		U.O.N.	UNLESS OTHERWISE NOTED
H.C.	HANDICAPPED		
H.B.	HOSE BIB	VAR.	VARIES
HDW.	HARDWARE	V.G.T.	VINYL COMPOSITION TILE
H.M.	HOLLOW METAL	VERT.	VERTICAL
HORIZ.	HORIZONTAL	VEST.	VESTIBULE
HT.	HEIGHT	V.I.F.	VERIFY IN FIELD
HVAC	HEATING, VENTILATION & AIR CONDITIONING	V.N.C.	VINYL WALL COVERING
		W	WITH
I.D.	INSIDE DIAMETER	W.	WIDTH
IN., "	INCHES	WD.	WOOD
INFO.	INFORMATION	WDW.	WINDOW
INSUL.	INSULATION	WGT., WT.	WEIGHT
INT.	INTERIOR	W/O	WITHOUT
		WP.	WEATHERPROOF
		WWF	WELDED WIRE FABRIC

DRAWINGS LIST

SCOPE OF WORK - BASE BID AND ALTERNATES

THIS PROJECT CONSISTS OF INTERIOR RENOVATIONS TO AN EXISTING SCHOOL FOR A NEW SECURITY VESTIBULE. THE DESIGN IS INTENDED TO RECONFIGURE THE EXISTING ENTRANCE TO CREATE A SECURED VESTIBULE THAT DIRECTS ALL VISITORS TO THE MAIN OFFICE.

BASE BID IMPROVEMENTS TO THE SPACE ARE LIMITED TO INTERIOR WORK AND INCLUDE ALL OR MOST OF THE FOLLOWING ASPECTS:

SELECTIVE DEMOLITION - PROJECT INCLUDES REMOVAL OF EXISTING NON-BEARING STUD PARTITIONS AND/OR MASONRY WALLS, DOORS, FRAMES, HARDWARE, INTERIOR WINDOWS, CEILINGS, AND OTHER FINISH SYSTEM COMPONENTS.

CARPENTRY AND GENERAL TRADES - THE PROJECT REQUIRES INSTALLATION OF NEW LIGHT GAUGE METAL STUDS WALLS, NEW DOORS AND HARDWARE.

DOORS AND WINDOWS - THE PROJECT INCLUDES RETROFIT OF EXISTING AND/OR INSTALLATION OF NEW STOREFRONT DOORS, FRAMES, AND HARDWARE.

FINISHES - THE PROJECT REQUIRES RETROFIT OF EXISTING FINISHES AND INSTALLATION OF NEW CEILING FINISH SYSTEMS IN THE WORK AREA SHOWN AS REQUIRED TO REPLACE EXISTING FINISHES. THE PROJECT ALSO REQUIRES WALL PAINTING INCLUDING NEW AND EXISTING WALLS IMMEDIATELY ADJACENT TO THE WORK AREA.

SPRINKLER SYSTEM - THE BUILDING IS EQUIPPED WITH A SPRINKLER SYSTEM THAT WILL REQUIRE RETROFIT TO ACCOMMODATE THE NEW STOREFRONT LAYOUT. THE SCOPE OF SPRINKLER WORK IS EXPECTED TO BE LIMITED TO ADJUSTING HEAD LOCATIONS AND ADDING HEADS WHERE NECESSARY.

MECHANICAL - THE PROJECT REQUIRES THE RETROFIT OF THE EXISTING HEATING AND COOLING SYSTEM. THE SYSTEM IS CONFIGURED WITH DUCTED SUPPLY AND DUCTED RETURN.

ELECTRICAL - THE PROJECT INCLUDES RETROFIT OF EXISTING AND INSTALLATION OF NEW LOW VOLTAGE ACCESS CONTROL DEVICES AS WELL AS NEW LIGHTING, NEW POWER/DATA DISTRIBUTION AND DEVICES, NEW WIRING AND RACEWAYS AND NEW SOUND SYSTEM.

NO SITE WORK OR UTILITY WORK IS INCLUDED. NO CONCRETE WORK IS INCLUDED.

NO MASONRY WORK IS INCLUDED. NO STRUCTURAL STEEL OR MISCELLANEOUS METAL WORK IS INCLUDED.

NO PLUMBING WORK IS INCLUDED. NO EXTERIOR ENVELOPE WORK OR ROOF WORK IS INCLUDED.

SECURITY DOOR HARDWARE AND ACCESS CONTROL

BASE BID — INCLUDES NON-ELECTRIFIED MANUALLY SECURED HARDWARE AT NEW CROSS CORRIDOR DOORS

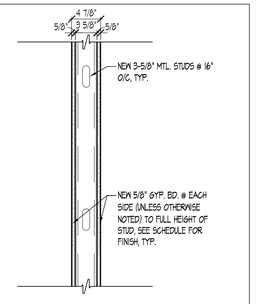
ALTERNATE #A — INCLUDES ADDING ELECTRONIC HARDWARE AND TIMERS AT NEW CROSS CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE. ELECTRONIC HARDWARE TO BE PROGRAMMED VIA THE FCPS SECURITY SYSTEM TO CONTROL THE LOCK AND UNLOCK OF NEW CORRIDOR DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. NO CARD READERS ARE INCLUDED.

ALTERNATE #B — INCLUDES ADDING CARD READERS AT BOTH SIDES OF NEW CROSS CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE.

WALL TYPE NOTES:

1. EXTERIOR DIMENSIONS ARE TO FINISHED FACE OF MASONRY, UNLESS OTHERWISE INDICATED.
2. INTERIOR DIMENSIONS ARE TO FINISHED FACE OF EXISTING WALLS, CENTER LINES OF COLUMNS, CENTER OF OPENINGS AT METAL FRAMING, AND/OR ARE TO FACE OF NEW METAL STUDS, UNLESS OTHERWISE INDICATED.
3. FIRESTOP ALL FRAMED PARTITIONS AS REQUIRED BY CODE.
4. WALL TYPES SHALL BE THE SAME CONTINUOUS TO END OF WALL OR NEXT WALL TYPE DESIGNATION.
5. SIMILAR WALL TYPES SHALL BE CARRIED ABOVE ALL DOORS, WINDOWS, AND OPENINGS U.O.N.
6. EXTEND ALL NEW WALLS/ INSULATION TO UNDERSIDE OF FINISHED CEILING, UNLESS OTHERWISE INDICATED.
7. PROVIDE SMOKE PARTITIONS & RATED WALLS AS SHOWN ON EGRESS PLAN.

(-) RATED WALL TYPE (-) NON-RATED WALL TYPE



1	3-5/8" NON-RATED INTERIOR METAL STUD PARTITION
1 SIM.	5/8" GYP. BD. @ EXPOSED FACE OF WALL ONLY

1 / A0.1 TYPICAL WALL TYPES
SCALE: 1" = 1'-0"

SCALE 1 1/2 0 1/2 1 1-1/2 2 FEET

ADA MANEUVERING CLEARANCES AT DOORS

SCALE: 1/4" = 1'-0"

NOTE: '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN' FIGURE NUMBERS REFERENCED, FOR ADDITIONAL INFORMATION REFER TO THE FULL '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN'.

SCALE 4 2 0 2 4 6 8 FEET

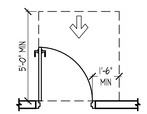


FIGURE 404.2.4.1 (a)
FRONT APPROACH, PULL SIDE

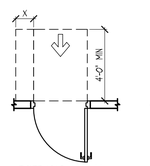


FIGURE 404.2.4.1 (b) & (c)
FRONT APPROACH, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH)

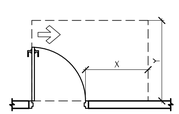


FIGURE 404.2.4.1 (d) & (e)
HINGE APPROACH, PULL SIDE
(NOTE: X = 36" IF Y = 60" OR X = 42" IF Y = 54")

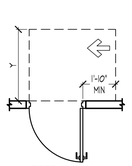


FIGURE 404.2.4.1 (f) & (g)
HINGE APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH, THEN Y = 48")

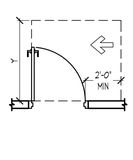


FIGURE 404.2.4.1 (h) & (i)
LATCH APPROACH, PULL SIDE
(NOTE: Y = 48" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 54")

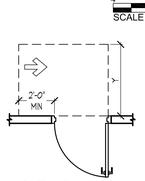


FIGURE 404.2.4.1 (j) & (k)
LATCH APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 48")

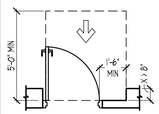


FIGURE 404.2.4.3 (a)
RECESSED DOOR, PULL SIDE

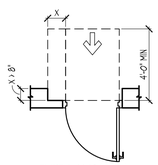


FIGURE 404.2.4.3 (b) & (c)
RECESSED DOOR, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH CLOSER & LATCH)

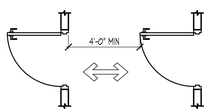


FIGURE 404.2.6 (a)
DOORS & GATES IN A SERIES

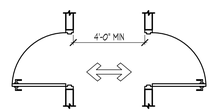


FIGURE 404.2.6 (b)
DOORS & GATES IN A SERIES

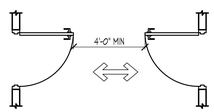


FIGURE 404.2.6 (c)
DOORS & GATES IN A SERIES

Proffitt & Assoc. ARCHITECTS
49 SOUTH CARROLL STREET
FREDERICK, MARYLAND 21701
PHONE (301) 662-8532
FAX (301) 662-4192
info@proffittandassociates.com

I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE No. 14510
EXPIRATION DATE 03-07-2020

NEW SECURITY VESTIBULE RENOVATIONS FOR:
BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

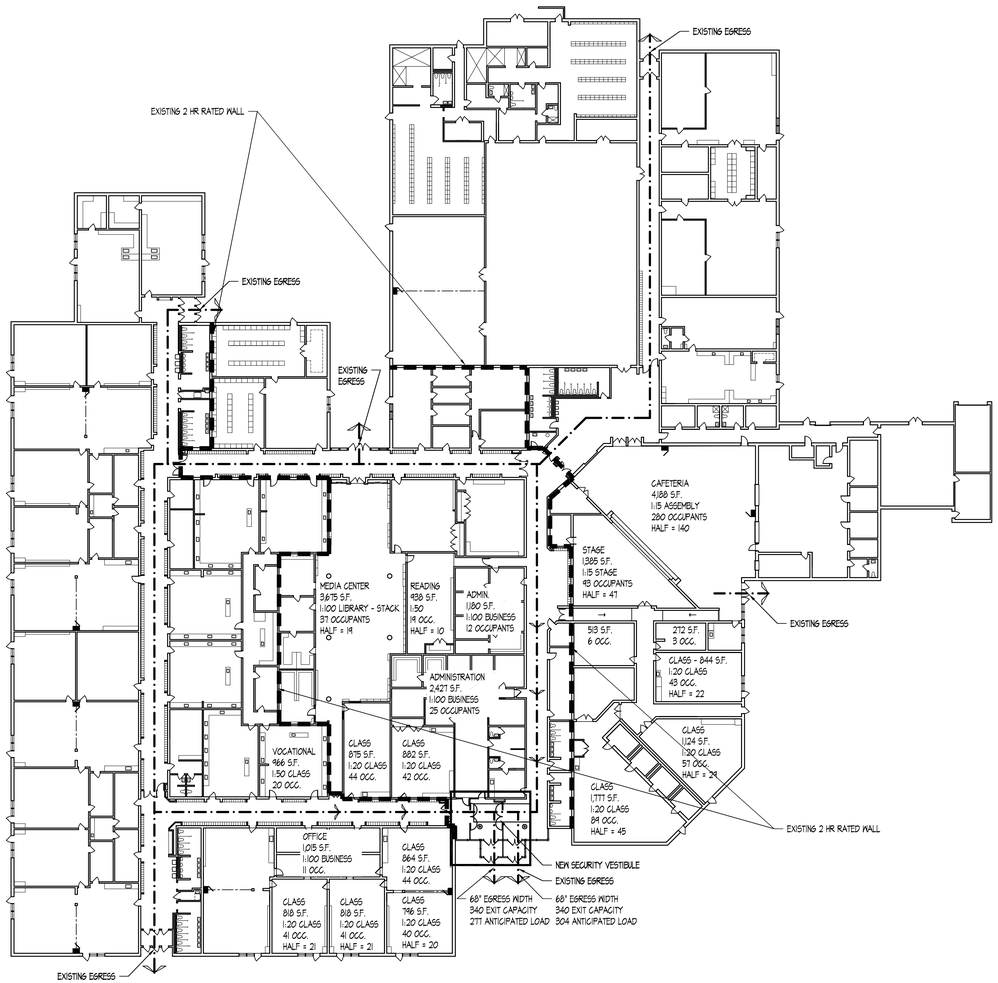
ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.02
DATE: 02-23-2018

COVER SHEET

A0.1



1 / CA1.1 EGRESS FLOOR PLAN

SCALE: 1/32" = 1'-0"

32 16 0 16 32 48 64
SCALE FEET

TRUE NORTH / PLAN NORTH

NOTE: THIS EGRESS PLAN IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY TO INDICATE THE LOCATION OF ALL MAIN POINTS OF EGRESS FROM THE BUILDING'S LEVEL OF EXIT DISCHARGE. ALTHOUGH NO OCCUPANT LOAD OR EXIT CAPACITY CALCULATIONS WERE PERFORMED, NO INCREASE OR DECEASE IN OCCUPANT LOAD WILL RESULT FROM THESE MODIFICATIONS. SIMILARLY, THE IMPROVEMENTS FOR THE SECURITY VESTIBULE AT THE MAIN ENTRANCE WILL IN NO WAY COMPROMISE OR REDUCE THE EGRESS CAPACITY THROUGH THE MAIN ENTRANCE WHEN CONSIDERED AS A POINT OF EGRESS.

CODE ANALYSIS:

REFERENCE IBC 2015

IBC CONSTRUCTION CLASSIFICATION: 2B — IBC USE GROUP E: EDUCATIONAL

ALLOWABLE HEIGHT & AREA CALCULATIONS:
(PER TABLES 504.3, 504.4 & 506.2, SPRINKLERED)
ALLOWABLE AREA PERMITTED PER FLOOR: 58,000 S.F.
ALLOWABLE BUILDING HEIGHT (ABOVE GRADE PLANE): 3 STORIES (75'-0")
ACTUAL HEIGHT & AREA CALCULATIONS:
TOTAL ACTUAL EXISTING FOOTPRINT (COMBINED 3 FIRE AREAS): 117,240 S.F.
TOTAL ACTUAL HEIGHT (ABOVE GRADE PLANE): 1 STORY (30'-4")
NOTE: NO ADDITIONS OR INCREASE IN AREA OR OCCUPANT LOAD TO EXISTING BUILDING.

NOTES:

NO PROPOSED BUILDING ADDITIONS OR INCREASE IN OCCUPANT LOAD WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS. NO CHANGES TO EXISTING EGRESS CAPACITY OR EXISTING PLUMBING FIXTURES WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS.

BUILDING CODE REQUIREMENTS:

NOTE: REQUIREMENTS 'X'ED OUT ARE LESS STRINGENT. MORE STRINGENT REQUIREMENTS ARE USED.

	REQUIRED	
ITEM	IBC 2015	NFPA-101 2015
EXTERIOR WALLS (LOAD-BEARING)	PER TABLE 601 & 602: X ≥ 30' FIRE SEPARATION DIST. 0 HOURS	
EXTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601 & 602: X ≥ 30' FIRE SEPARATION DIST. 0 HOURS	
PRIMARY STRUCTURAL FRAME	PER TABLE 601: 0 HOURS	
FLOOR CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
ROOF CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (LOAD-BEARING)	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601: 0 HOURS	
FIRE WALLS	PER TABLE 706.4, EXC A: 2 HOURS	PER SECTION 7.2.4.3: 2 HOURS
FIRE PARTITIONS	PER SECTION 708.3: 1 HOUR	PER SECTION 15.3.6 (2): NO SPECIAL REQUIREMENTS
CORRIDORS	PER TABLE 1020.1: 0 HOURS W/ SPRINKLER SYSTEM	PER SECTION 15.3.6 (2): 0 HOURS W/ SPRINKLER SYSTEM
DEAD END CORRIDORS	PER SECTION 1020.4, EXC 2: 50' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.5.2: 50' MAX W/ SPRINKLER SYSTEM
COMMON PATH OF TRAVEL	PER SECTION 1006.2.1: 75' MAX W/ SPRINKLER SYSTEM	~~PER SECTION 15.2.6.3.1:~~ ~~100' MAX W/ SPRINKLER SYSTEM~~
EXIT ACCESS TRAVEL	PER TABLE 1017.2: 250' MAX W/ SPRINKLER SYSTEM	~~PER SECTION 15.2.6.3:~~ ~~200' MAX W/ SPRINKLER SYSTEM~~
REMOTENESS	PER SECTION 1007.1.1(2): 1/3 OF DIAG. DISTANCE	PER SECTION 7.5.1.3.3: 1/3 OF DIAG. DISTANCE
CORRIDOR WIDTH	PER SECTION 1020.2: 44" W/ CAPACITY < 100 72" W/ CAPACITY ≥ 100	PER SECTION 15.2.3.2: 72" EXIT ACCESS CORRIDORS
	PER SECTION 1005.3.2: 0.2" PER OCCUPANT	PER TABLE 7.3.3.1: 0.2" PER OCCUPANT
STAIRWAY WIDTH	PER SECTION 1011.2: 36" W/ CAPACITY < 50 44" W/ CAPACITY ≥ 50	PER TABLE 7.2.2.2.1.2(B): TOTAL CUMULATIVE OCC. LOAD: 44" W/ CAPACITY < 2000 56" W/ CAPACITY > 2000
	PER SECTION 1005.3.1: 0.3" PER OCCUPANT	PER TABLE 7.3.3.1: 0.3" PER OCCUPANT

APPLICABLE BUILDING CODES:

AUTHORITY HAVING JURISDICTION: FREDERICK COUNTY, MARYLAND

1. BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE (IBC) WITH AMENDMENTS
MARYLAND BUILDING REHABILITATION CODE COMAR
2. FIRE CODE: 2015 NFPA 1 FIRE CODE (LSC) W/ AMENDMENTS, PER STATE OF MD FIRE CODE
2015 NFPA 101 LIFE SAFETY CODE (LSC) W/ AMENDMENTS, PER STATE OF MD FIRE CODE
STATE OF MARYLAND FIRE PREVENTION CODE
3. MECHANICAL: 2015 INTERNATIONAL MECHANICAL CODE (IMC)
4. ENERGY: 2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
5. GAS: 2015 INTERNATIONAL FUEL GAS CODE (IFGC) WITH AMENDMENTS
6. PLUMBING: 2015 INTERNATIONAL PLUMBING CODE (IPC) WITH AMENDMENTS
9. ELECTRICAL: 2014 NATIONAL ELECTRIC CODE (NEC)
10.ACCESSIBILITY: 2015 IBC EXCEPT WHERE THE PROVISIONS OF THE MARYLAND ACCESSIBILITY CODE (COMAR.05.02.02) ARE MORE STRINGENT &
2010 ADA STANDARDS FOR ACCESSIBLE DESIGN (2010 STANDARDS)

Proffitt & Assoc. ARCHITECTS
49 SOUTH CARROLL STREET
FREDERICK, MARYLAND 21701
PHONE (301) 662-8532
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FREDERICK, MARYLAND 21703

ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.02
DATE: 02-23-2018

CODE ANALYSIS & EGRESS FLOOR PLAN

CA1.1

TYPICAL DEMOLITION GENERAL NOTES:

1. AREAS OF DEMOLITION DENOTED BY DASHED LINES.
2. THE CONTRACTOR SHALL RETURN ALL SALVAGEABLE MATERIAL AND/OR EQUIPMENT NOTED TO BE REMOVED ON SHEET A1.1 TO THE OWNER. THE OWNER SHALL STORE SALVAGEABLE MATERIAL AND/OR EQUIPMENT AT THEIR DISCRETION. THE CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGEABLE MATERIALS IN ACCORDANCE WITH OWNER'S RECOMMENDATIONS AND LOCAL ZONING CODES.
3. THE CONTRACTOR SHALL CONSULT WITH THE ARCHITECT ON ANY CONCEALED CONDITIONS UNCOVERED DURING DEMOLITION THAT IMPEDES THE EXECUTION OF THE DESIGN AS INDICATED ON THE DRAWINGS.
4. ALL AREAS OF DEMOLITION SHALL BE PATCHED OR REPAIRED AS REQUIRED.
5. COORDINATE DEMOLITION WITH PROPOSED NEW CONSTRUCTION INCLUDING CEILINGS, LIGHTS, POWER, DATA, SPRINKLER HEADS, WALLS, DOORS, FRAMES, HARDWARE, FINISHES, CONCRETE SLABS, ETC.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE BUILDING AT ALL TIMES AND TO PROVIDE AND BE RESPONSIBLE FOR SHORING AND BRACING REQUIRED THROUGHOUT THE CONSTRUCTION PERIOD.
7. ANY ITEMS NOT NOTED TO BE DEMOLISHED, BUT REQUIRING REMOVAL IN ORDER TO ACCOMPLISH THE REQUIRED DEMOLITION WORK, SHALL BE REINSTALLED OR REPLACED IN KIND IN LOCATION DIRECTED BY OWNER UPON COMPLETION OF THE NEW CONSTRUCTION UNLESS OTHERWISE NOTED.
8. JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. ANY AREAS DAMAGED BY THE DEMOLITION AND/OR CONSTRUCTION WORK SHALL BE REPAIRED AND/OR RECEIVE NEW SUBSTRATES, FINISHES, AND/OR MATERIALS TO MATCH THE EXISTING AFFECTED ITEMS. ANY REPAIR OR REPLACEMENT WORK SHALL BE PERFORMED TO A LEVEL OF QUALITY EQUAL TO THAT FOUND PRIOR TO BEGINNING WORK ON THIS PROJECT.
10. THE SELECTIVE DEMOLITION AS SHOWN ON THE DRAWINGS IS DIAGRAMMATIC, AND IN NO WAY ATTEMPTS TO SHOW ALL EXISTING FIXTURES, CONNECTIONS AND FITTINGS, AND OTHER MISCELLANEOUS ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING/COORDINATING ALL MISCELLANEOUS DEMOLITION AS REQUIRED DUE TO FIELD CONDITIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL THE CONTAINMENT OF DUST AND DEBRIS DURING THE DEMOLITION PERIOD AND SHALL OBTAIN ALL REQUIRED PERMITS AND COORDINATE WITH THE COUNTY BUILDING DEPARTMENT THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. DAILY SITE CLEANING WILL BE REQUIRED WITH ADDITIONAL CLEANING IF REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
12. PRIOR TO BEGINNING DEMOLITION, THE CONTRACTOR SHALL SUBMIT TO THE OWNER A DEMOLITION PLAN OUTLINING THE DESIRED PLACEMENT OF DUMPSTERS, DUST AND DEBRIS CONTROL MEASURES AND SCHEDULE OF ACTIVITIES. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO EACH DEMOLITION ACTIVITY.
13. PROVIDE TEMPORARY COVER OR PARTITIONS TO PROTECT EXIST. BUILDING DURING CONSTRUCTION FROM EXPOSURE TO AND DAMAGE FROM THE ELEMENTS.
14. EXISTING FINISHES SPECIFICALLY NOT CALLED OUT TO BE REMOVED ARE TO REMAIN (PAINT, FLOORING, ETC.). PREPARE EXISTING SURFACES FOR APPLICATION OF NEW FINISHES AS REQUIRED BY MANUFACTURER RECOMMENDATIONS
15. SEE MECHANICAL, PLUMBING, & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.

SELECTIVE DEMOLITION NOTES:

1. REMOVE EXISTING NON-BEARING CMU WALL ABOVE AND INCLUDING HOLLOW METAL FRAME, DOOR, GLAZING AND ASSOCIATED HARDWARE (INCLUDING FLOOR AND WALL BUMPERS). PATCH AND REPAIR ALL ADJACENT SURFACES SHOWN TO REMAIN, UNLESS OTHERWISE NOTED.
2. REMOVE & SALVAGE EXISTING DISPLAY CASE, INCLUDING GLASS SHELVES, GLASS DOORS AND TRACK, LIGHT FIXTURES, AND OAK VENEER TOP, SIDES, BOTTOM, BACK AND TRIM. REPAIR & PATCH ADJACENT SURFACES SHOWN TO REMAIN AND PREP TO RECEIVE NEW FINISHES. COORD. RELOCATION W/ FCPS.
3. REMOVE EXIST. CARPET AND PREP. SLAB TO RECEIVE NEW VCT.

DEMOLITION KEY:

- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- WALL TO BE REMOVED
- WINDOW TO BE REMOVED
- DOOR AND FRAME TO BE REMOVED

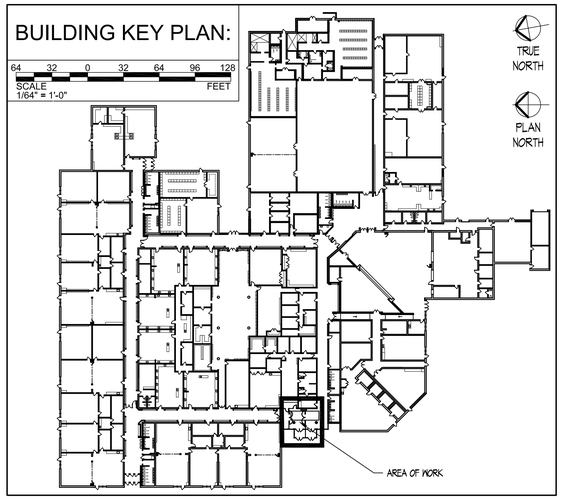
PROPOSED KEY:

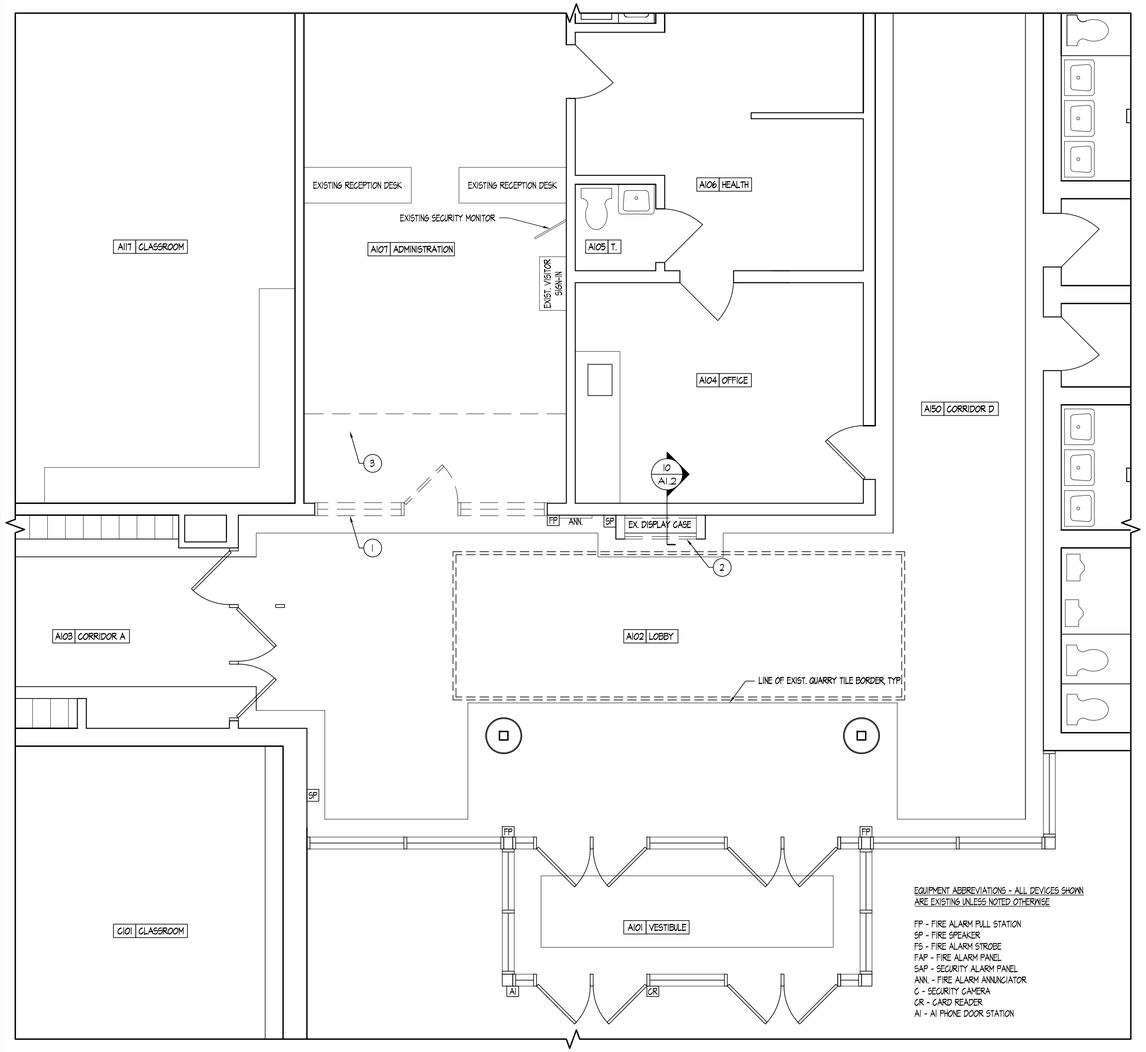
- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- NEW WALL
- NEW DOOR AND FRAME
- NEW STOREFRONT (SF)

NEW CONSTRUCTION GENERAL NOTES:

1. DIMENSIONS NOTED "CLR" (CLEAR) ARE NOT ADJUSTABLE WITHOUT APPROVAL FROM THE ARCHITECT.
2. IF CONFLICTS OCCUR BETWEEN DRAWING AND EXISTING FIELD CONDITIONS, THE GENERAL CONTRACTOR SHALL IMMEDIATELY CONTACT THE ARCHITECT FOR DIRECTION.
3. ALL NEW PARTITIONS SHOWN ABUTTING TO EXISTING COLUMNS OR WALLS SHALL ALIGN WITH FACE OF EXISTING FINISHED SURFACE UNLESS OTHERWISE NOTED IN THE DRAWINGS.
4. PATCH AND FINISH EXISTING AREAS DISTURBED BY CONSTRUCTION OF NEW ARCHITECTURAL, STRUCTURAL, ELECTRICAL, AND MECHANICAL WORKS. RESTORE AND REPAIR TO MATCH EXISTING ADJACENT AREA IN MATERIAL AND FINISH.
5. ALL PIPE AND CONDUIT PENETRATIONS THROUGH ANY FIRE RATED ASSEMBLIES SHALL BE FIRESTOPPED WITH TESTED UL RATED THROUGH PENETRATION FIRE STOP SYSTEMS BEARING THE REQUIRED RATINGS.

BUILDING KEY PLAN:



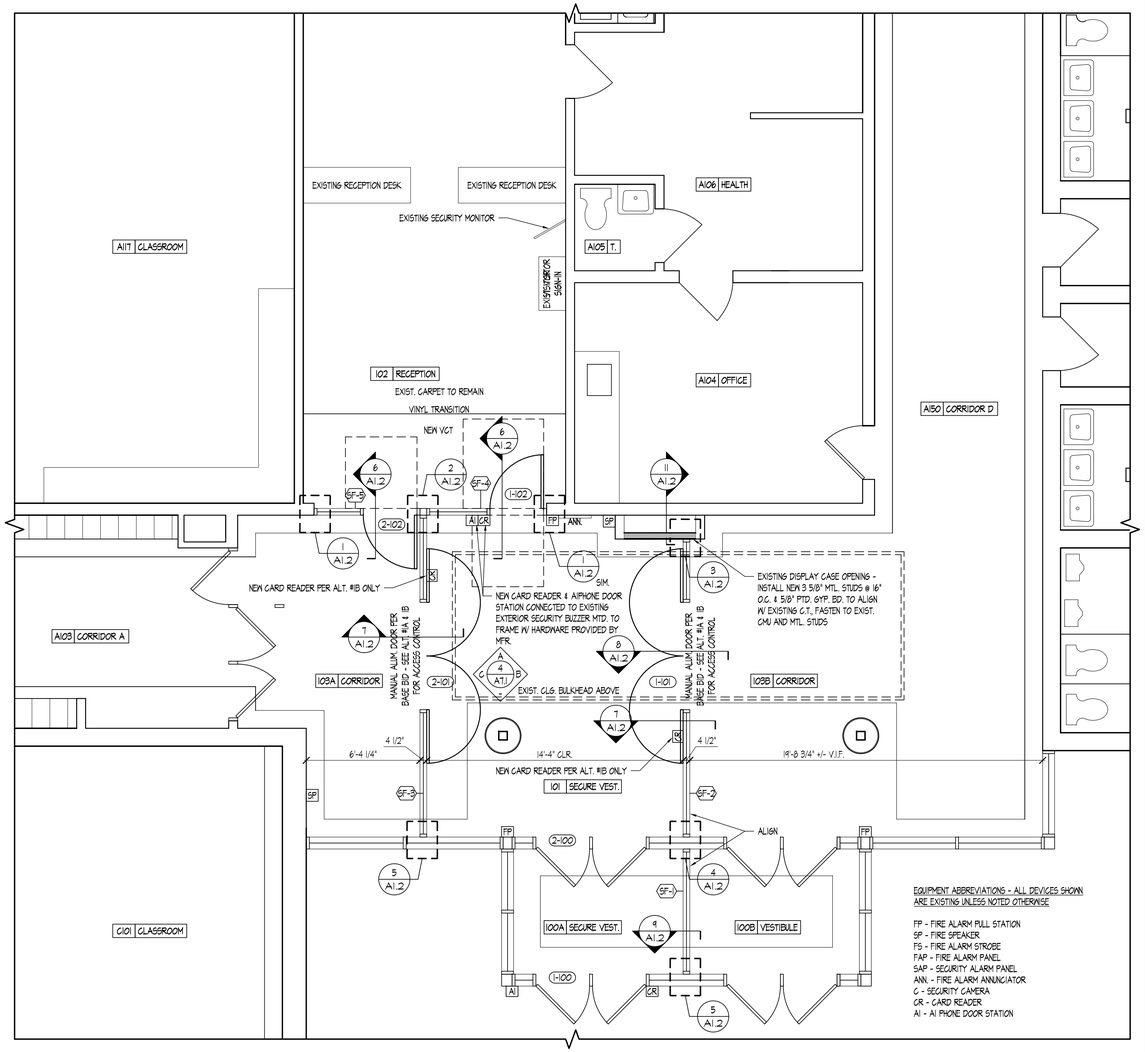


1 A1.1 EXISTING / DEMOLITION FLOOR PLAN

SCALE: 1/8" = 1'-0"

8 4 0 4 8 12 16 SCALE FEET

TRUE NORTH PLAN NORTH



2 A1.1 PROPOSED FLOOR PLAN

SCALE: 1/8" = 1'-0"

8 4 0 4 8 12 16 SCALE FEET

TRUE NORTH PLAN NORTH

Proffitt & Assoc. ARCHITECTS

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BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

ISSUE		
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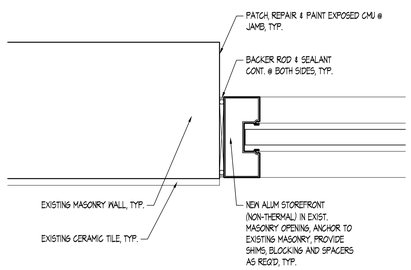
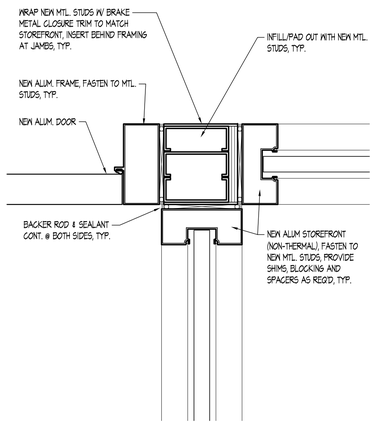
EXISTING / DEMOLITION & PROPOSED FLOOR PLANS

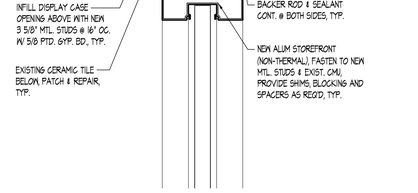
A1.1



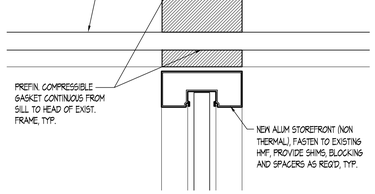
1 A1.2 PLAN DETAIL
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



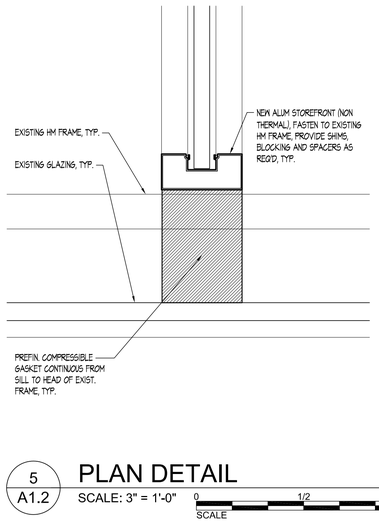
2 A1.2 PLAN DETAIL
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



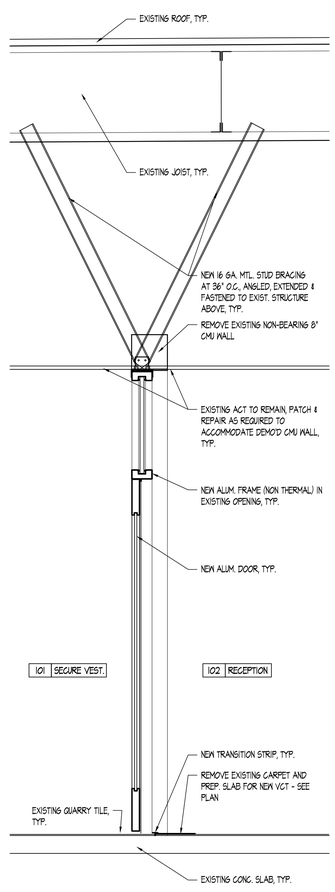
3 A1.2 PLAN DETAIL
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



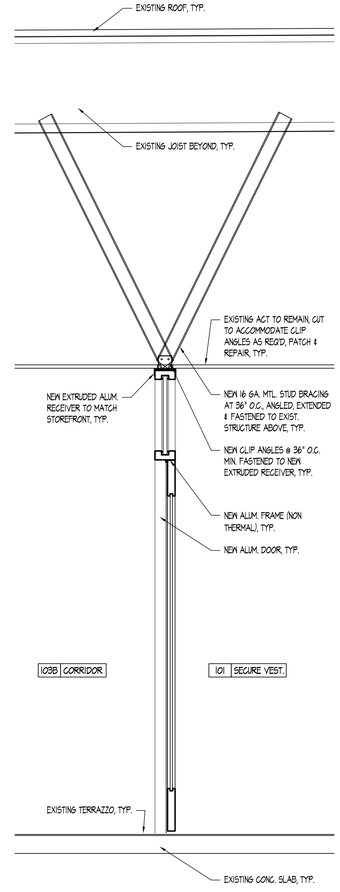
4 A1.2 PLAN DETAIL
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



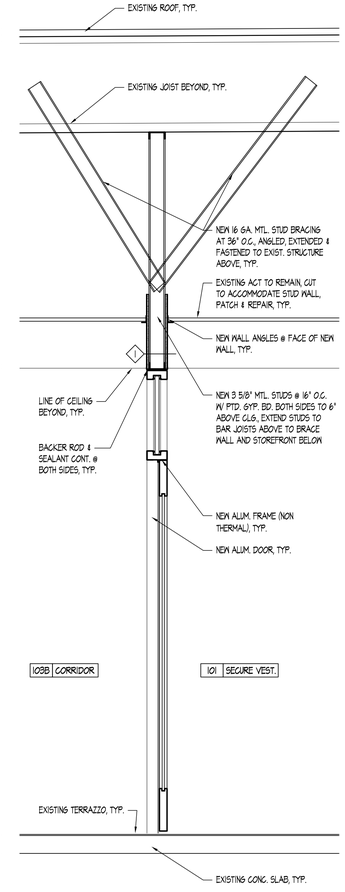
5 A1.2 PLAN DETAIL
SCALE: 3" = 1'-0"
SCALE 0 1/2 1 FEET



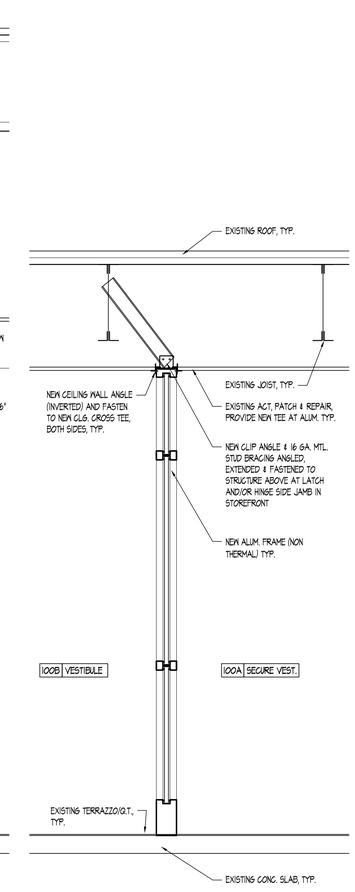
6 A1.2 WALL SECTION
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



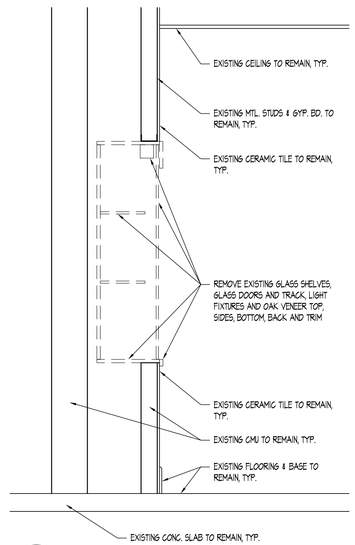
7 A1.2 WALL SECTION
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



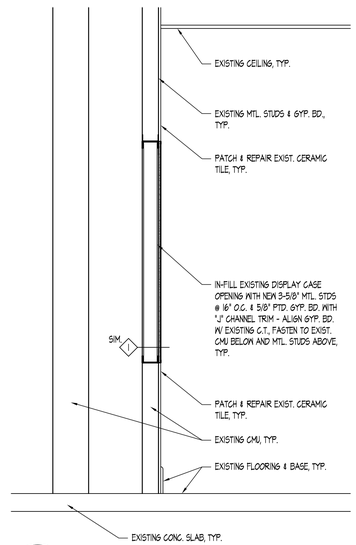
8 A1.2 WALL SECTION
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



9 A1.2 WALL SECTION
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



10 A1.2 DEMO. DETAIL @ DISPLAY CASE
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET



11 A1.2 PROPOSED DETAIL @ DISPLAY CASE
SCALE: 3/4" = 1'-0"
SCALE 1 0 1 2 3 FEET

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BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

ISSUE

REV	DATE	DESCRIPTION
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PROJECT NO.: 15-30.02
DATE: 02-23-2018

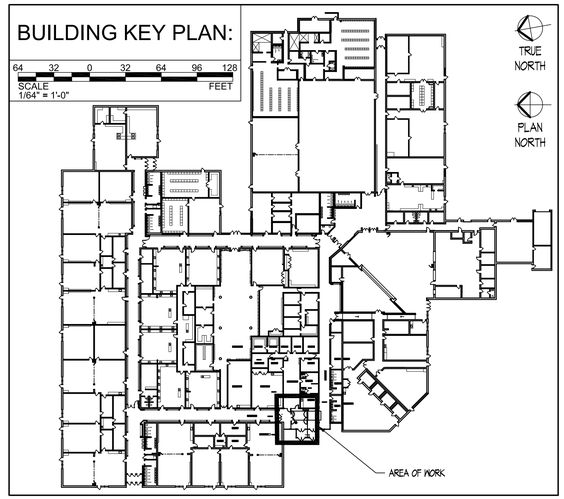
PROPOSED PLAN DETAILS & WALL SECTIONS

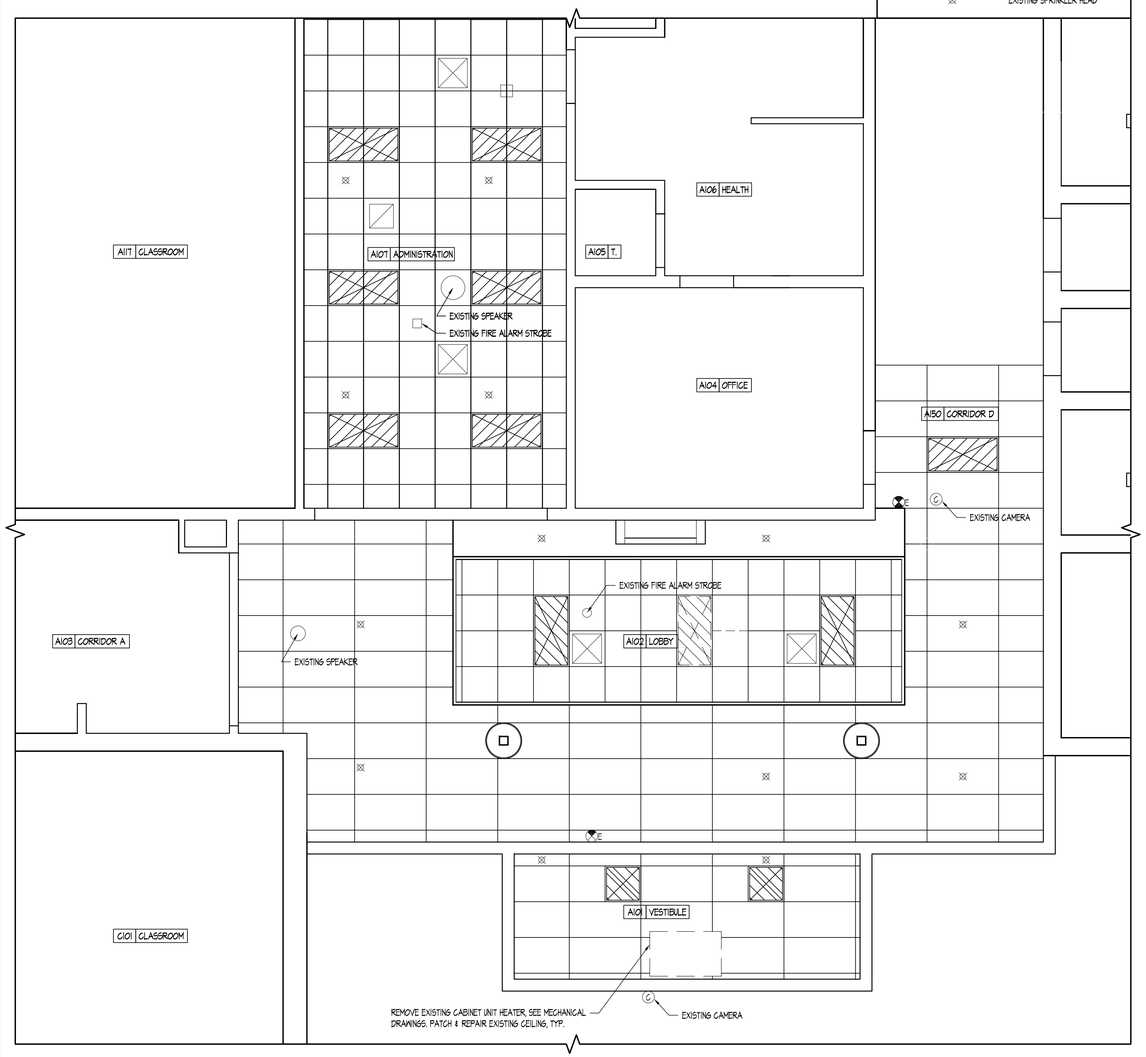
A1.2

REF. CEILING KEY:

- EXISTING 2'-0" x 4'-0" CEILING GRID W/ EXISTING ACOUSTICAL CEILING TILE
- EXISTING 2'-0" x 4'-0" LIGHT FIXTURE TO REMAIN
- EXISTING 2'-0" x 4'-0" LIGHT FIXTURE TO BE REMOVED & SALVAGED FOR RE-USE
- RELOC. SALVAGED EXISTING 2'-0" x 4'-0" LIGHT FIXTURE IN NEW LOCATION
- EXISTING 2'-0" x 2'-0" LIGHT FIXTURE TO REMAIN
- NEW RECESSED LIGHT FIXTURE
- EXISTING DIFFUSER TO REMAIN
- MOVE EXISTING DIFFUSER TO NEW LOCATION
- E EXISTING EXIT SIGN
- N NEW EXIT SIGN
- EXISTING SPRINKLER HEAD

BUILDING KEY PLAN:



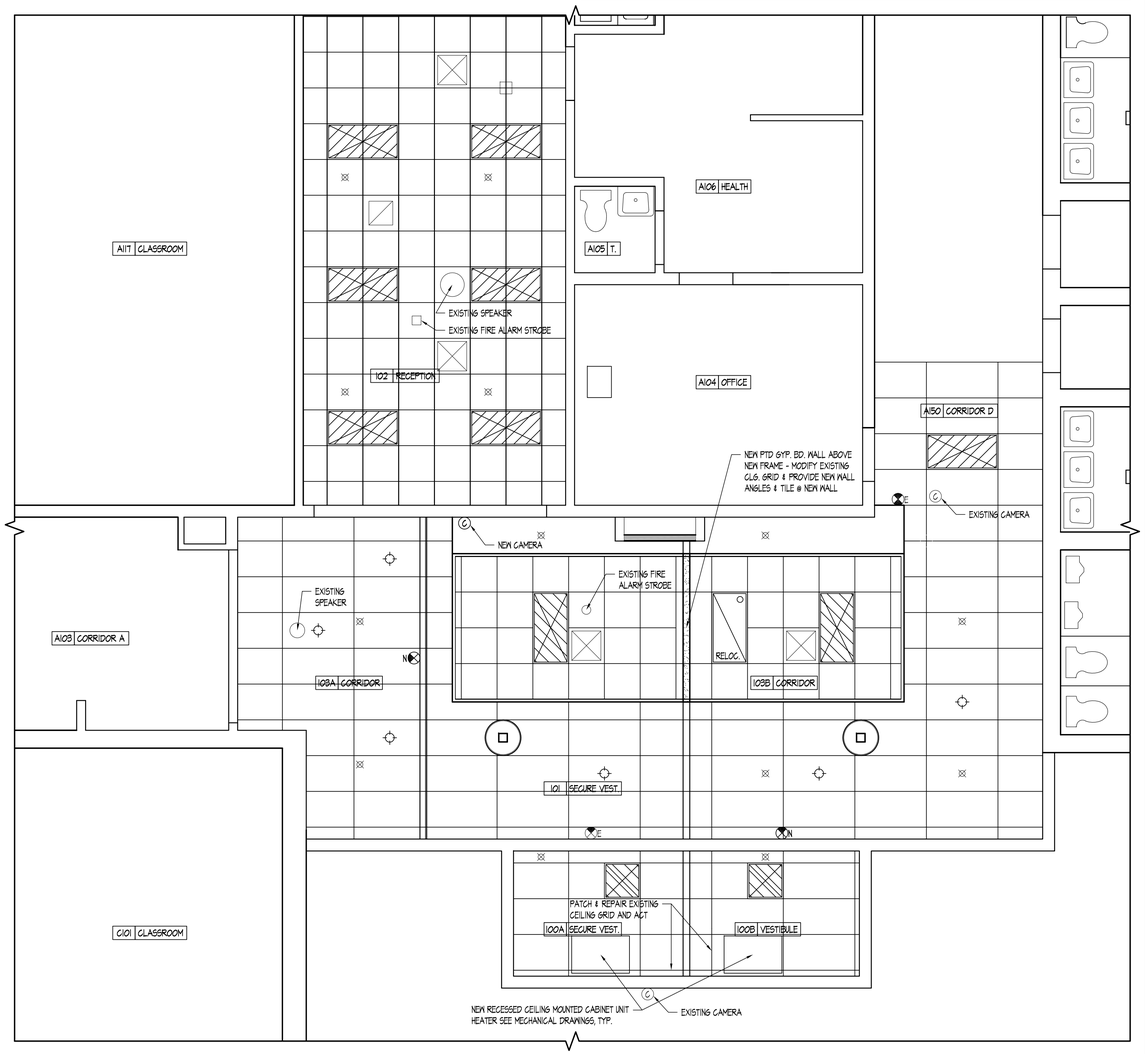


1 A6.1 EXISTING / DEMOLITION REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

8 4 0 4 8 12 16
SCALE FEET

TRUE NORTH PLAN NORTH



2 A6.1 PROPOSED REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

8 4 0 4 8 12 16
SCALE FEET

TRUE NORTH PLAN NORTH

Proffitt & Assoc. ARCHITECTS

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BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

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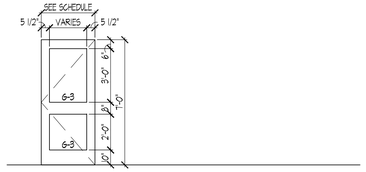
EXISTING / DEMO. & PROPOSED REFLECTED CEILING PLANS

A6.1

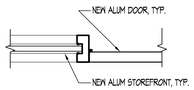


1

1 A7.1 DOOR TYPES

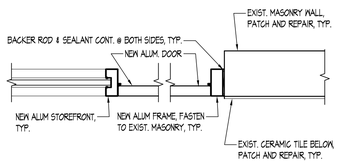
SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET



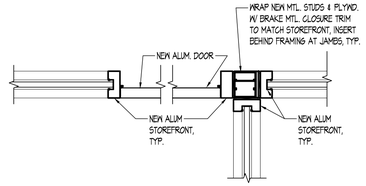
J - 1

ALUM. FRAME @ ALUM. STOREFRONT



J - 2

ALUM. FRAME @ ALUM. STOREFRONT & EXIST. MASONRY WALL



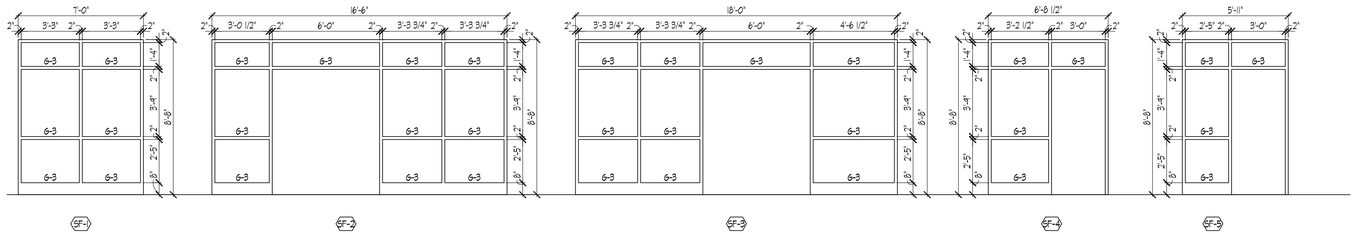
J - 3

ALUM. FRAME @ ALUM. STOREFRONT & EXIST. MASONRY WALL

2 A7.1 JAMB TYPES

SCALE: 1" = 1'-0"

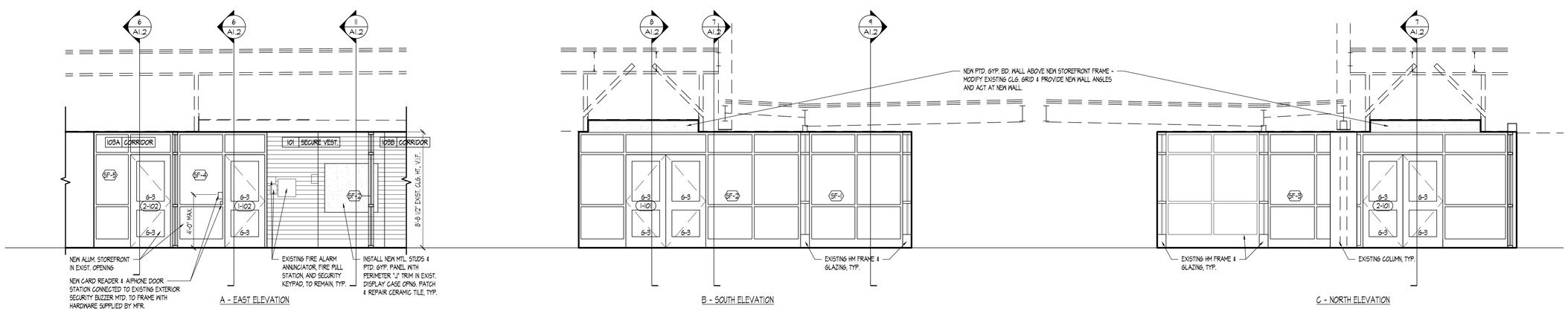
SCALE 1 1/2 0 1/2 1 1-1/2 2 FEET



3 A7.1 STOREFRONT TYPES

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET



A - EAST ELEVATION

B - SOUTH ELEVATION

C - NORTH ELEVATION

4 A7.1 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET

DOOR SCHEDULE

OPENING NUMBER	SIZE			DOOR			FRAME			JAMB TYPE	HARDWARE SET	REMARKS
	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH			
1-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	EXIST.	
2-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	EXIST.	
1-101	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-2	ALUM.	PREFIN.	J - 1	HW # 1 (BASE BID *)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALTERNATE #1B
2-101	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-3	ALUM.	PREFIN.	J - 1	HW # 1 (BASE BID *)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALTERNATE #1B
1-102	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-4	ALUM.	PREFIN.	J - 2	HW # 2	-
2-102	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-5	ALUM.	PREFIN.	J - 3	HW # 3	-

* BASE BID - SECURED NON-ELECTRIFIED HARDWARE
ADD ALT. #1A - ELEC. LATCH RETRACTION TIMED WITH CLASS CHANGES
ADD ALT. #1B - ELEC. LATCH RETRACTION TIMED WITH CLASS CHANGES AND ACTIVATED BY CARD READER

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOORS		WALLS								CEILING		REMARKS
				NORTH		EAST		SOUTH		WEST				
		MATERIAL	BASE	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	HEIGHT	
100A	SECURE VESTIBULE	EXIST.	EXIST.	EXIST.	-	EXIST.	-	SF-1	PREFIN.	EXIST.	-	EXIST./ACT	-	PROVIDE NEW ACT TO MATCH EXIST. WHERE EXIST. CUH IS REMOVED
100B	VESTIBULE	EXIST.	EXIST.	SF-1	PREFIN.	EXIST.	-	EXIST.	-	EXIST.	-	EXIST./ACT	-	PROVIDE NEW ACT TO MATCH EXIST. WHERE EXIST. CUH IS REMOVED
101	SECURE VESTIBULE	EXIST.	EXIST.	SF-3	PREFIN.	EXIST. CT & GYP. BD. / NEW GYP. BD. / SF-4	PTD-1 * / PREFIN.	GYP. BD. / SF-2	PTD-1* / PREFIN.	EXIST.	-	EXIST.	-	* PTD-1 @ NEW GYP. BD. @ DISPLAY CASE & ABOVE NEW STOREFRONT.
102	RECEPTION	EXIST.	EXIST.	EXIST.	-	EXIST.	-	EXIST.	-	EXIST. / SF-4 / SF-5	PTD-1 / PREFIN.	EXIST.	-	-
103A	CORRIDOR	EXIST.	EXIST.	EXIST.	-	EXIST. / SF-5	PREFIN.	SF-3	PREFIN.	EXIST.	-	EXIST.	-	-
103B	CORRIDOR	EXIST.	EXIST.	GYP. BD. / SF-2	PTD-1 * / PREFIN.	EXIST. / GYP. BD.	PTD-1 *	EXIST.	-	EXIST.	-	EXIST.	-	* PTD-1 @ NEW GYP. BD. @ DISPLAY CASE & ABOVE NEW STOREFRONT

FINISH SELECTIONS SCHEDULE

TYPE	ABBR.	FINISH	SELECTION	REMARKS
WALL	PTD-1	TYPICAL WALL PAINT	SEE SPECIFICATIONS	MATCH EXISTING PAINT USING ATTIC STOCK
CEILING	ACT-1	ACOUSTICAL CEILING TILE	SEE SPECIFICATIONS	MATCH EXISTING ARMSTRONG TILE USING ATTIC STOCK

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SCHEDULES & TYPES

A7.1

HVAC ABBREVIATIONS

AHJ	AUTHORITY HAVING JURISDICTION
AMP	AMPERE
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
ATM	ATMOSPHERE
AWG	AMERICAN WIRE GAUGE
BTU	BRITISH THERMAL UNIT
BV	BALL VALVE
CFM	CUBIC FEET PER MINUTE
DIFF	DIFFUSER
ETC	ETCETERA
ESP	EXTERNAL STATIC PRESSURE
EWT	ENTERING WATER TEMPERATURE
EXIST	EXISTING
GPM	GALLONS PER MINUTE
GV	GATE VALVE
HP	HORSE POWER
HORIZ	HORIZONTAL
HTG	HEATING
HTRS	HEATERS
HW	HOT WATER (PLUMBING)
HWR	HOT WATER RETURN (PLUMBING)
HZ	FREQUENCY (HERTZ)
KW	KILOWATT
MAX	MAXIMUM
MBH	THOUSAND BTU's
MFGR	MANUFACTURER
MIN	MINIMUM
MTD	MOUNTED
NTS	NOT TO SCALE
PH	PHASE
RPM	REVOLUTIONS PER MINUTE
SA	SUPPLY AIR
SCH	SCHEDULE
SENS	SENSIBLE
SH	SENSIBLE HEAT
SPEC	SPECIFICATION
SQ FT	SQUARE FEET
STR	STRAINER
SUP	SUPPLY
TAB	TEST, ADJUST AND BALANCE
T'STAT	THERMOSTAT
UNO	UNLESS NOTED OTHERWISE
V	VOLT
WPD	WATER PRESSURE DROP

HVAC EQUIPMENT ABBREVIATIONS

CUH	CABINET UNIT HEATER

HVAC PIPING ABBREVIATIONS

HWS	HOT WATER SUPPLY (HEATING)
HWR	HOT WATER RETURN (HEATING)

HVAC PIPING SYMBOLS

- PIPE ELBOW DOWN
- DIRECTION OF FLOW
- BALL VALVE
- BALANCING VALVE
- STRAINER

HVAC SYMBOLS

- THERMOSTAT
- CONNECTION POINT - NEW TO EXISTING
- DISCONNECTION POINT
- NUMBERED NOTES
- REVISION SEQUENCE
- S1 (2) 200 AIRFLOW / TAG (THROWS) — GRILLE, REGISTER AND DIFFUSER TAG
- SUPPLY DIFFUSER - 4-WAY BLOW
- CABINET UNIT HEATER

ELECTRICAL REQUIREMENTS FOR MECHANICAL EQUIPMENT

1. GENERAL REQUIREMENTS

   A. HVAC CONTRACTOR SHALL PROVIDE MECHANICAL EQUIPMENT WITH VOLTAGES AND OTHER ELECTRICAL CHARACTERISTICS AS INDICATED ON THE DRAWINGS AND WITHIN THE SPECIFICATIONS.

   B. ALL STARTERS, DISCONNECT SWITCHES, MOTOR CONTROL CENTERS, AND VARIABLE FREQUENCY DRIVES, FOR EQUIPMENT PROVIDED UNDER DIVISION 23, SHALL BE FURNISHED UNDER DIVISION 23 AND INSTALLED UNDER DIVISION 26. FACTORY MOUNTED STARTERS, DISCONNECTS SWITCHES, AND VARIABLE FREQUENCY DRIVES SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23. HVAC CONTRACTOR SHALL PROVIDE STARTERS, DISCONNECT SWITCHES, MOTOR CONTROL CENTERS AND VARIABLE FREQUENCY DRIVES IN ACCORDANCE WITH DIVISION 26.

   C. HVAC CONTRACTOR SHALL SUBMIT WIRING DIAGRAMS TO THE ARCHITECT/ENGINEER FOR APPROVAL AND PROVIDE APPROVED DIAGRAMS TO THE ELECTRICAL CONTRACTOR SO THAT THE ELECTRICAL WORK MAY BE PROPERLY ACCOMPLISHED.

   D. HVAC CONTRACTOR SHALL FULLY COOPERATE WITH THE OTHER DIVISIONS AND TRADES ON THE PROJECT, AND THEIR MANUFACTURERS, IN PROMPTLY PROVIDING THE INFORMATION REQUIRED FOR PROPER COORDINATION OF MOTOR PROTECTION, CONTROL EQUIPMENT AND WIRING, AND THE OTHER CHARACTERISTICS OF THE EQUIPMENT.

   E. IT SHALL BE THE RESPONSIBILITY OF THE HEATING AND ELECTRICAL CONTRACTORS TO CHECK FOR ADEQUACY OF SUPPLY WIRING, OVERCURRENT PROTECTION, PROPER VOLTAGE, PHASE ROTATION AND FINAL LOCATION OF EQUIPMENT PROVIDED PRIOR TO THE RUNNING OF ANY CONDUIT OR WIRING. COORDINATE WITH DIVISION 26 TO ASSURE PROPER ELECTRICAL SERVICE IS PROVIDED TO EQUIPMENT UNDER DIVISION 23.

   F. EQUIPMENT CONNECTIONS SHALL BE MADE THROUGH CONDUIT OR RACEWAYS IN ACCORDANCE WITH DIVISION 26, WITH THE EXCEPTION THAT CONNECTIONS TO MOTORS SHALL BE MADE THROUGH LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH EQUIPMENT GROUNDING CONDUCTOR.

2. POWER REQUIREMENTS

   A. ALL POWER WIRING FOR MECHANICAL EQUIPMENT PROVIDED UNDER DIVISION 23 SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 26 TO THE POINT OF FINAL CONNECTION (FROM THE SOURCE TO THE STARTERS, DISCONNECT SWITCHES, MCC'S OR VFD'S AND TO EQUIPMENT, MOTOR, OR OTHER CONNECTION POINT). EXCEPT WHERE SPECIFICALLY INDICATED OTHERWISE, ALL POWER WIRING TO THE POINT OF FINAL CONNECTION FOR EQUIPMENT PROVIDED UNDER DIVISION 23 SHALL BE ACCOMPLISHED UNDER DIVISION 26.

   B. FINAL ELECTRICAL POWER CONNECTIONS TO ALL EQUIPMENT SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 26. IN GENERAL, THE POINT OF FINAL CONNECTION SHALL BE THE TERMINAL HOUSING ON THE EQUIPMENT, MOTOR, OR AN INTERNAL JUNCTION BOX ON THE EQUIPMENT OR ITEM. IF NO JUNCTION BOX IS FURNISHED, A JUNCTION BOX SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 26. WIRE LEADS OF ADEQUATE LENGTH TO ENSURE A PROPER CONNECTION AT THE FINAL LOCATION SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 26.

   C. WIRING, OVERCURRENT PROTECTION DEVICES, VOLTAGE, PHASE, ROTATION AND FINAL LOCATION OF ALL EQUIPMENT PROVIDED UNDER DIVISION 23 SHALL BE COORDINATED WITH ALL SIMILAR DEVICES AND POWER WIRING FURNISHED AND INSTALLED UNDER DIVISION 26. COORDINATION SHALL BE ACCOMPLISHED PRIOR TO THE RUNNING OF ANY CONDUIT OR WIRING.

3. CONTROL REQUIREMENTS

   A. ALL CONTROL WIRING (LINE VOLTAGE AND/OR LOW VOLTAGE) FOR MECHANICAL EQUIPMENT PROVIDED UNDER DIVISION 23, SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23. WIRING FROM THE POWER SOURCE TO ALL CONTROL PANELS, DDC CONTROL PANELS, STARTERS, OPERATOR WORK STATIONS (PC'S, PRINTERS, MONITORS, AND OTHER WORK STATION EQUIPMENT) AND OTHER CONTROL EQUIPMENT REQUIRED FOR A COMPLETE AND OPERABLE CONTROL SYSTEM SERVING MECHANICAL EQUIPMENT PROVIDED UNDER DIVISION 23 SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23.

   C. UNLESS OTHERWISE NOTED, ALL TEMPERATURE CONTROL DEVICES, INSTALLED PILOT DEVICES, AND ALL ASSOCIATED PILOT CONTROL EQUIPMENT, FOR ALL EQUIPMENT PROVIDED UNDER DIVISION 23, SHALL BE FURNISHED AND INSTALLED UNDER DIVISION 23.

PROJECT GENERAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS AND APPLICABLE CODES AND REGULATIONS.
7. THE LOCATION OF EXISTING EQUIPMENT AND UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
8. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
10. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
12. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.
13. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
14. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
15. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 26 OF THE SPECIFICATION.
18. WHEN MECHANICAL WORK IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDED A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
19. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
20. ALL MISCELLANEOUS STEEL REQUIRED TO ENSURE PROPER INSTALLATION AND AS SHOWN IN DETAILS FOR PIPING, DUCTWORK AND EQUIPMENT (UNLESS OTHERWISE NOTED) SHALL BE FURNISHED AND INSTALLED BY THE MECHANICAL CONTRACTOR.
21. PROVIDE ACCESS PANELS FOR INSTALLATION IN WALLS AND CEILINGS, WHERE REQUIRED TO SERVICE DAMPERS, VALVES, SMOKE DETECTORS AND OTHER CONCEALED MECHANICAL EQUIPMENT. ACCESS PANELS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR FOR INSTALLATION.
22. ALL EQUIPMENT, PIPING, DUCTWORK, ETC. SHALL BE SUPPORTED AS DETAILED, SPECIFIED AND REQUIRED TO PROVIDE A VIBRATION-FREE INSTALLATION.
24. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT SUPPORTED FROM A METAL DECK.
26. LOCATIONS AND SIZES OF FLOOR, WALL AND ROOF OPENINGS SHALL BE COORDINATED WITH ALL OTHER TRADES INVOLVED.
29. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING EQUIPMENT AND UTILITIES BEFORE COMMENCING WORK.

SHEET METAL GENERAL NOTES

1. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
2. LOCATE ALL MECHANICAL EQUIPMENT (CABINET UNIT HEATERS) FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS, AND VALVES.
3. COORDINATE DIFFUSERS, REGISTER AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.
4. UNLESS OTHERWISE SHOWN, LOCATE ALL ROOM THERMOSTATS AND HUMIDISTATS 42" (CENTERLINE) ABOVE THE FINISHED FLOOR. NOTIFY THE PROFESSIONAL OF ANY ROOMS WHERE THE PRECEDING LOCATION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.

HVAC PIPING GENERAL NOTES

1. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES INVOLVED. OFFSETS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
2. UNLESS OTHERWISE NOTED, ALL PIPING IS OVERHEAD, TIGHT TO THE UNDERSIDE OF THE STRUCTURE OR SLAB, WITH SPACE FOR INSULATION IF REQUIRED.
3. INSTALL PIPING SO ALL VALVES, STRAINERS, UNIONS, TRAPS, FLANGES, AND OTHER APPURTENANCES REQUIRING ACCESS ARE ACCESSIBLE.
4. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN EQUIPMENT OR PIPING ON THE EQUIPMENT SIDE OF THE VALVE IS REMOVED.
5. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND THE MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
6. ALL VALVES (EXCEPT CONTROL VALVES) AND STRAINERS SHALL BE THE FULL SIZE OF THE PIPE BEFORE REDUCING IN SIZE TO MAKE CONNECTIONS TO EQUIPMENT AND CONTROLS.
7. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.
8. ALL VALVES SHALL BE ADJUSTED FOR SMOOTH AND EASY OPERATION.

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STATE OF MARYLAND — CHRISTOPHER J. CLARK — 45511 — PROFESSIONAL ENGINEER

NEW SECURITY VESTIBULE RENOVATIONS FOR:
BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

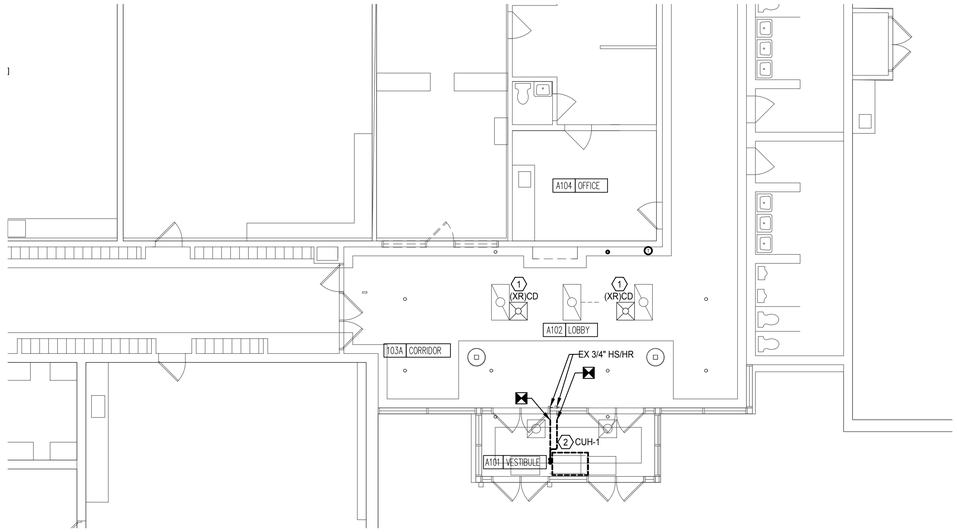
ISSUE

REV	DATE	DESCRIPTION

PROJECT NO.: 17-0670
DATE: 5-17-2018

SYMBOLS, ABBREVIATIONS & NOTES

M001



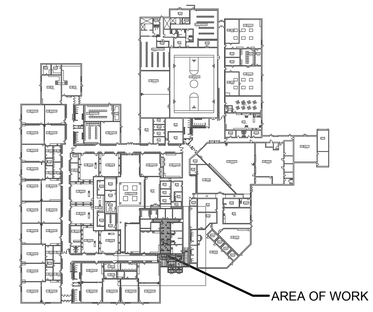
1 / M-201 **PART FIRST FLOOR PLAN - DEMOLITION - MECHANICAL**
1/8" = 1'-0"

NUMBERED NOTES:

1. PROVIDE PRE-DEMOLITION TESTING OF EXISTING SUPPLY AIR.
2. REMOVE CABINET UNIT HEATER AND ALL ASSOCIATED PIPING, INSULATION, HANGERS AND SUPPORTS TO EXTENT INDICATED.

GENERAL NOTES:

G1: REVISE/EXTEND EXISTING WET SPRINKLER PIPE. MODIFY, RELOCATE PIPE, ADD HEADS AS NECESSARY TO ACCOMMODATE RENOVATION AS REQUIRED. PROVIDE SPRINKLER DRAWING TO FIRE MARSHAL. INSTALL PER NFPA 13 AND COORDINATE INSTALLATION WITH LOCAL FIRE MARSHAL. COORDINATE/VERIFY EXACT LIMITS OF AREA AFFECTED TO BE REVISED WITH ARCHITECTURAL DRAWINGS.



8 4 0 4 8 12 16
SCALE FEET

TRUE NORTH PLAN NORTH

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ISSUE

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PROJECT NO.: 17-0670
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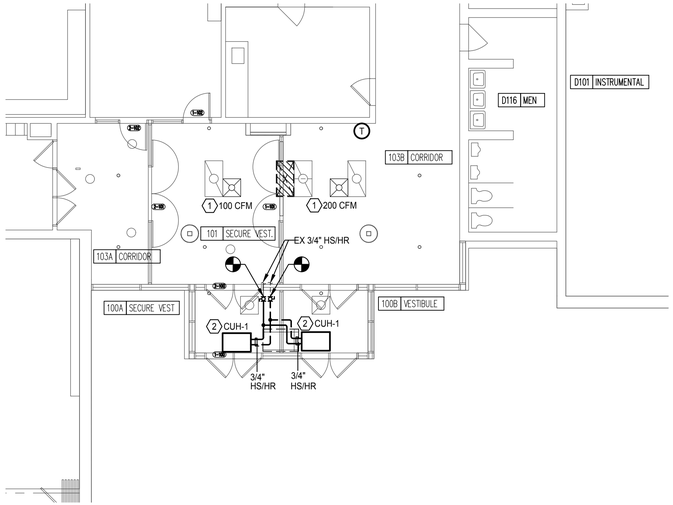
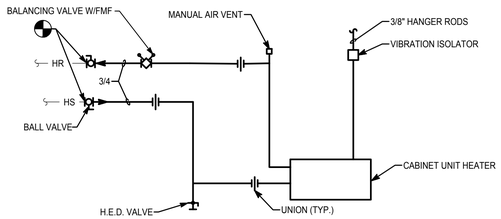
PART FIRST FLOOR PLAN - DEMOLITION

M101



1 M-201 **PART FIRST FLOOR PLAN - NEW WORK - MECHANICAL**
1/8" = 1'-0"



PIPING DETAIL - HOT WATER CABINET UNIT HEATER

NOT TO SCALE

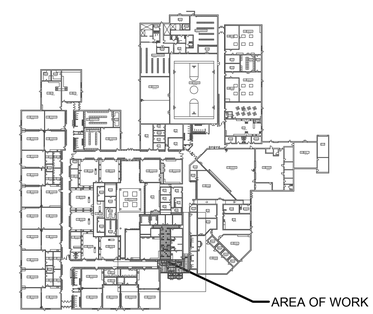
NUMBERED NOTES:

1. BALANCE EXISTING AIR DEVICE TO INDICATED AIRFLOW.
2. PROVIDE CABINET UNIT HEATER. REFER TO SCHEDULES FOR ADDITIONAL DETAILS.

CABINET UNIT HEATER SCHEDULE

DESIG.	SERVICE	MIN. CAPACITY (MBH)	MIN. AIRFLOW (CFM)	MAX. FLOWRATE 180°F EWT (GPM)	MAX. WPD (FT W.G)	MOTOR HP	MOTOR FLA (KW)	MOTOR V/PH/HZ	REMARKS	MANUF	MODEL
CUH-1	100A, 100B VESTIBULE,	8.2	150	0.5	0.1	0.03	1.7	120V/1Ø/60HZ	1,2	MODINE	CW 002

NOTES:
1. U.L LISTED
2. PROVIDE INTERAL T-STAT



8 4 0 4 8 12 16
SCALE FEET

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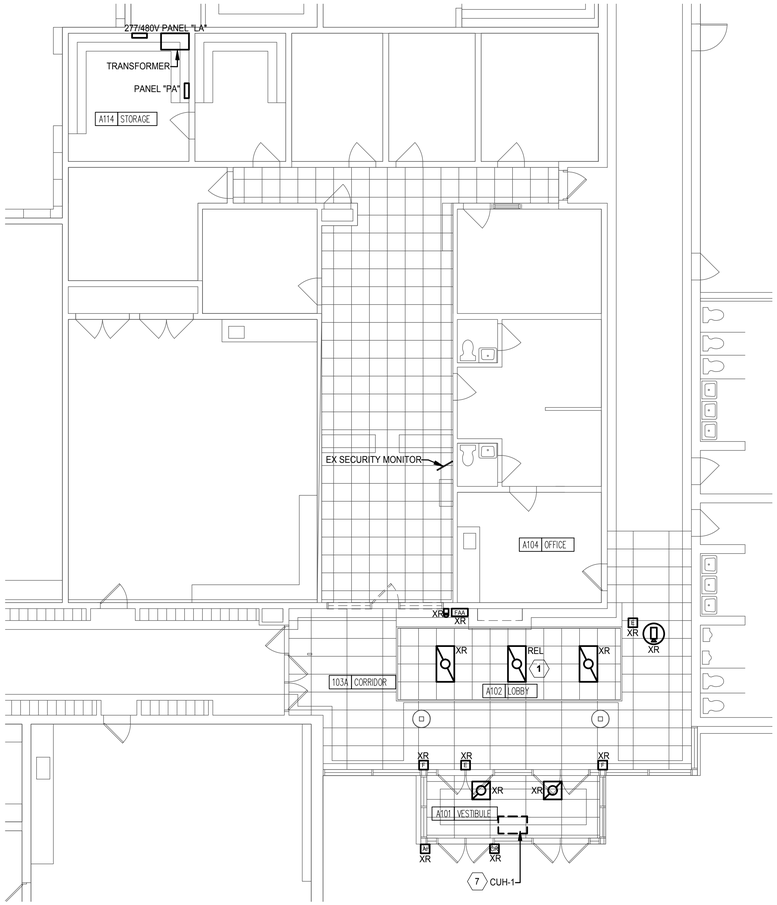
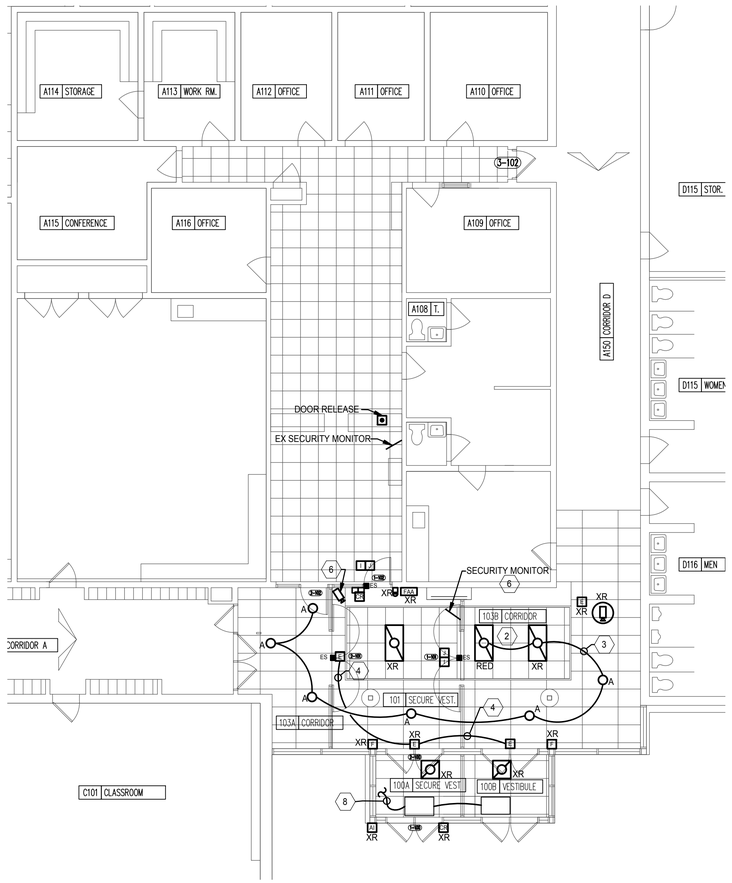
PART FIRST FLOOR PLAN - MECHAINCAL DETAILS AND SCHEDULES

M201



1 E101 **PART FLOOR PLAN - DEMOLITION - ELECTRICAL**
1/8" = 1'-0"



2 E101 **PART FLOOR PLAN - NEW WORK - ELECTRICAL**
1/8" = 1'-0"

NUMBERED NOTES:

1. EXISTING FIXTURE SHALL BE DISCONNECTED AND REMOVED FOR RELOCATION.
2. RELOCATED FIXTURE, RECONNECTED TO EXISTING CIRCUIT.
3. CONNECT NEW LIGHT FIXTURES TO EXISTING LIGHTING CIRCUIT.
4. CONNECT NEW EXIT SIGNS TO EXISTING EXIT SIGN CIRCUIT,
5. DOORS SHALL BE CONTROLLED VIA DOOR RELEASE AND TIMER. COORDINATE WITH SCHOOL FOR ALL SETTINGS.
6. PROVIDE CAMERA AND MONITOR ACCORDING TO FCPS REQUIREMENTS AND CONNECT TO EXISTING SYSTEM.
7. DISCONNECT EXISTING CUH-1 FOR REMOVAL. CIRCUIT SHALL BE RETAINED FOR RE-USE.
8. CONNECT NEW CUH-1'S AND RECONNECT TO EXISTING CIRCUIT.

LIGHTING FIXTURE SCHEDULE

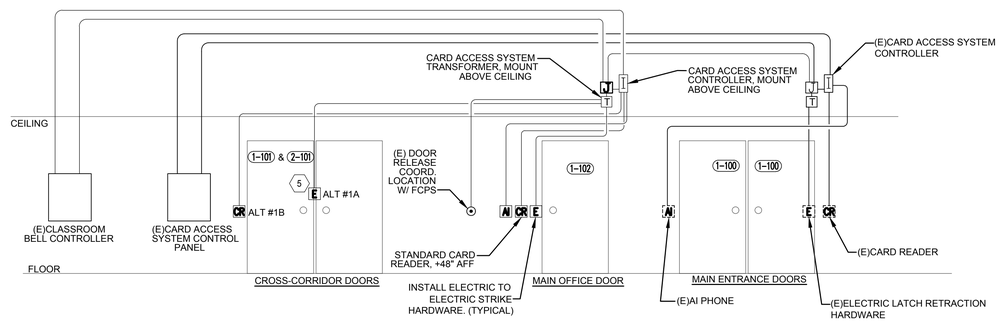
MARK	NUMBER OF LAMPS AND WATTAGE	MANUFACTURE	CATALOG NUMBER	DRIVER VOLTAGE	TYPE OF MOUNTING	REMARKS
A	LED (37.5 W)	LITHONIA	LDN635/05-L06WR-LSS-MVOLT-EZ10	UNV	RECESSED	
E	LED (1.4W)	LITHONIA	LQM-S-W-3-R-120/277	UNV	SURFACE	

PROJECT DIRECTIVE:

MAIN OFFICE
BASE BID:
PROVIDE ELECTRONIC ACCESS INTO THE MAIN OFFICE FROM THE NEW SECURITY VESTIBULE. BASE BID TO INCLUDE:
a. CARD READER ON THE NEW SECURITY VESTIBULE SIDE FOR ACCESS INTO MAIN OFFICE
b. AI PHONE ON THE NEW SECURITY VESTIBULE SIDE WIRED AND CONNECTED TO THE EXTERIOR AI PHONE FOR THE OPERATION OF DOOR RELEASE OF BOTH DOORS.

CROSS-ORRIDORS
ALTERNATE #1A:
PROVIDE ELECTRONIC HARDWARE AT EACH PAIR OF CROSS CORRIDOR DOORS FOR THE PURPOSES OF PROGRAMMING VIA THE FCPS SECURITY SYSTEM. THE LOCKING AND UNLOCKING OF DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. HARDWARE WILL INCLUDE CONCEALED ROD WITH ELECTRIC RETRACTION.

ALTERNATE #1B:
ENHANCE ALTERNATE #1A BY ADDING CARD READERS AT EACH PAIR OF CROSS CORRIDOR DOORS.



CARD ACCESS SYSTEM RISER
NO SCALE

POWER

- EXISTING PANELBOARD
- J — JUNCTION BOX
- JUNCTION BOX - CEILING
- EMERGENCY POWER OFF PUSH BUTTON

SECURITY & DOOR CONTROL

- SSCP — SECURITY SYSTEM CONTROL PANEL
- SECURITY CAMERA
- SECURITY CAMERA IN BUBBLE
- CR — CARD READER
- AI — AIPHONE DOOR STATION
- PUSH-BUTTON
- DC — DOOR CONTACT
- ES — ELECTRIC STRIKE
- EML — ELECTROMAGNETIC DOOR LOCK
- ELECTROMAGNETIC DOOR HOLDER

EXISTING CONDITIONS/ DEMOLITION NOTES:

D1. CONDUITS & WIRING REQUIRED FOR THE CONTINUITY OF LIGHTING, OUTLETS, SYSTEMS AND EQUIPMENT THAT IS TO REMAIN SHALL REMAIN UNDISTURBED OR SHALL BE RECONNECTED BY THE CONTRACTOR AS REQUIRED TO MAINTAIN SERVICE. THIS WORK SHALL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.

D2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED AT THE SITE BY THE ELECTRICAL CONTRACTOR, PRIOR TO PRICING.

D3. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE REMOVED, THE EC SHALL REMOVE THE EQUIPMENT AND AND ALL ASSOCIATED WIRING AND CONDUITS BACK TO THE SERVICE POINT.

D4. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE RELOCATED, THE EC SHALL RELOCATE THE EQUIPMENT AS SHOWN ON THE PLANS AND RECONNECT THE EQUIPMENT AS REQUIRED TO MAINTAIN SERVICE. PATCH ALL OPENINGS IN THE WALL, CEILINGS, OR FLOORS CREATED BY THE DEMOLITION WORK.

D5. CONDUITS AND WIRING MADE OBSOLETE DUE TO NEW CONSTRUCTION SHALL BE REMOVED IN IT'S ENTIRETY, BACK TO THE SERVICE POINT.

D6. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR THE LIMITS OF DEMOLITION WORK.

D7. REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT LOCATIONS OF THE MECHANICAL EQUIPMENT THAT WILL BE DISCONNECTED.

LIGHTING

- LIGHTING FIXTURE - SEE FIXTURE SCHEDULE FOR MORE INFORMATION
- E — EXIT SIGN - DIRECTIONAL ARROWS AS INDICATED ON DRAWINGS

MISCELLANEOUS

- BRANCH CIRCUIT WIRING CONCEALED IN WALLS OR ABOVE CEILING
- BRANCH CIRCUIT WIRING - #10 AWG
- BRANCH CIRCUIT WIRING - UNDER FLOOR
- HOME RUN BACK TO PANEL
- LV — LOW VOLTAGE WIRING AND CONDUIT
- INDICATES CONTINUATION OF LINE

FIRE ALARM

- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR PANEL
- F — FIRE ALARM PULL STATION
- F — FIRE ALARM STROBE - WALL MOUNTED
- F — FIRE ALARM HORN/STROBE - WM
- FIRE ALARM AUDIBLE AND VISIBLE - CM
- F — FIRE ALARM STROBE - CM

DENOTATIONS & ABBREVIATIONS

EC	ELECTRICAL CONTRACTOR
F	FIRE ALARM
GC	GENERAL CONTRACTOR
LV	LOW VOLTAGE
M	MOTOR
MC	MECHANICAL CONTRACTOR
PRN	PRESENT LOCATION/ REPLACED WITH NEW
REL	RELOCATE
RED	RELOCATED
SEC	SECURITY SYSTEM
XR	EXISTING TO REMAIN

GENERAL PROJECT NOTES:

G1. UNLESS OTHERWISE NOTED, PROVIDE ALL EQUIPMENT SHOWN ON THE PLANS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SYMBOLS SHOWN ON THE PLANS WITH THE SYMBOL LIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INTENT OF ANY SYMBOL THAT IS SHOWN ON THE PLANS AND NOT INDICATED ON THE SYMBOL LIST WITH ELECTRICAL ENGINEER.

G2. COORDINATE THE FINAL LOCATIONS OF ALL LIGHT FIXTURES WITH THE ARCHITECT'S REFLECTED CEILING PLANS. REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO INSTALLATION.

G3. THE CONTRACTOR SHALL COORDINATE CONDUIT RUNS, CABLE TRAY, LIGHTING FIXTURES AND OTHER EQUIPMENT LOCATIONS WITH THE OTHER TRADE CONTRACTORS TO AVOID CONFLICTS.

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:45511, Expiration Date: 06/03/2018

STATE OF MARYLAND — CHRISTOPHER J. LONG — 45511 — PROFESSIONAL ENGINEER

NEW SECURITY VESTIBULE RENOVATIONS FOR:
BALLENGER CREEK MIDDLE SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
5525 BALLENGER CREEK PIKE
FREDERICK, MARYLAND 21703

ISSUE

REV	DATE	DESCRIPTION

PROJECT NO.: 17-0670
DATE: 5-17-2018

PART FLOOR PLAN - DEMOLITION AND NEW WORK - ELECTRICAL

E101

PROJECT INFORMATION

NEW SECURITY VESTIBULE RENOVATIONS FOR:

CATOCTIN HIGH SCHOOL

FREDERICK COUNTY PUBLIC SCHOOLS
14745 SABILLASVILLE RD,
THURMONT, MARYLAND 21788

CONTACT LIST

OWNER:

FREDERICK COUNTY PUBLIC SCHOOLS
191 SOUTH EAST STREET
FREDERICK, MD 21701
TEL. : (301)-644-5000

ARCHITECT:

PROFFITT & ASSOCIATES ARCHITECTS, PC
49 SOUTH CARROLL STREET
FREDERICK, MD 21701
TEL. : (301)-662-8532
FAX : (301)-662-4192

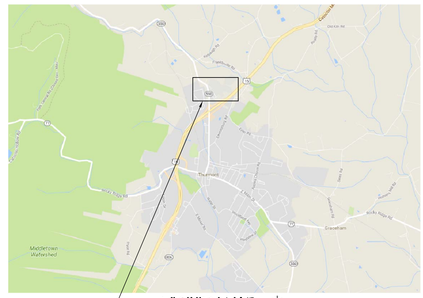
MECH. / ELEC. ENGINEER :

CJL ENGINEERING INC.
3 WEST SECOND STREET
FREDERICK, MD 21701
TEL. : (301)-695-9424
FAX : (301)-293-6338

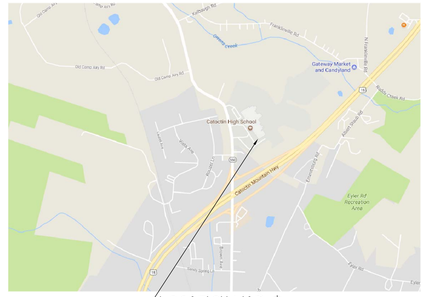
GENERAL NOTES

1. BIDDERS SHALL CAREFULLY EXAMINE THE PERMIT DOCUMENTS, ACQUAINT THEMSELVES WITH ALL GOVERNING LAWS AND CODES, VISIT THE SITE AND THOROUGHLY FAMILIARIZE THEMSELVES WITH EXISTING CONDITIONS BEFORE SUBMITTING BIDS.
2. ALL WORK DESCRIBED WITHIN THE CONTRACT DOCUMENTS SHALL BE DONE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, INCLUDING BUT NOT LIMITED TO, THE CURRENT BUILDING CODE, LIFE SAFETY CODE, ADAAG, AS WELL AS ORDINANCES AND REGULATIONS AND OTHER BUILDING CODES ENFORCED BY THE AUTHORITY HAVING JURISDICTION.
3. ALL MATERIALS SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S SPECIFICATIONS AND WARRANTY REQUIREMENTS.
4. INDIVIDUAL SUBCONTRACTORS FOR ANY PLUMBING, ELECTRICAL, AND MECHANICAL WORK SHALL OBTAIN ALL NECESSARY PERMITS, INSPECTIONS, ETC., AND PERFORM ALL WORK IN CONFORMANCE TO ALL LOCAL CODES.
5. DISTURB AS SMALL AN AREA OF THE SITE AS POSSIBLE DURING CONSTRUCTION OPERATIONS; UNLESS OTHERWISE NOTED, PREPARE AND SEED DISTURBED AREAS AT THE COMPLETION OF THE PROJECT.
6. REPAIR ALL AREAS DISTURBED BY THE WORK OF THIS PROJECT, INCLUDING SUBSTRATES OR STRUCTURAL REPAIRS, AND REPAIRS TO FINISHES TO MATCH AND ALIGN WITH EXISTING FINISHES TO REMAIN OR NEW FINISHES INSTALLED.
7. THE JOB SITE IS TO BE LEFT CLEAN AND FREE FROM DEBRIS AT ALL TIMES.
8. UNLESS OTHERWISE NOTED, ALL WORK IS CONSIDERED TO BE NEW CONSTRUCTION.
9. CONTRACTOR TO PROTECT ALL EXISTING UNDERGROUND UTILITIES AND VERIFY LOCATION PRIOR TO ANY EXCAVATION.
10. CONTRACTOR SHALL PROVIDE ALL NECESSARY SHORING, BRACING, AND TAKE OTHER PRECAUTIONS NECESSARY FOR SAFETY AS REQUIRED BY CODE AND PRACTICE.
11. CONTRACTOR SHALL PROVIDE ALL NECESSARY BLOCKING, CONCEALED WITHIN THE WALLS, FOR ATTACHMENT OF SURFACE AND/OR RECESSED MOUNTED EQUIPMENT OR ACCESSORIES, WHETHER SHOWN IN THE DRAWINGS OR NOT. BLOCKING TO BE FIRE RETARDANT.
12. CONTRACTOR SHALL SUPPLY ALL NECESSARY ANCHORS, TIES, CLIPS, HANGERS, BOLTS, AND OTHER FASTENING DEVICES AS REQUIRED BY CODE AND GOOD PRACTICE.
13. CONTRACTOR SHALL PROVIDE SEALANT AROUND WINDOWS, DOOR JAMBS AND HEADS, AND ADJACENT CONSTRUCTION.
14. PART OF THIS WORK MAY INCLUDE THE INSTALLATION AND/OR MODIFICATION OF A SPRINKLER SYSTEM IN AN EXISTING BUILDING. CONTRACTOR IS RESPONSIBLE TO CONCEAL ALL NEW PIPING WITHIN EXISTING CONSTRUCTION AND MAKE REPAIRS AS NECESSARY TO MATCH EXISTING OR NEW FINISHES.
15. PRIOR TO MODIFICATION OR ADDITION OF SPRINKLER IN EXISTING BUILDING, SUBCONTRACTOR TO CONFIRM FINAL CEILING HEIGHT WITH CONTRACTOR DUE TO JOB CONDITIONS.
16. EXISTING BUILDING INFORMATION IS BASED ON INFORMATION PROVIDED BY OTHERS AND PROFFITT & ASSOCIATES ARCHITECTS' FIELD SURVEYS. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND EXISTING CONDITIONS IN THE FIELD PRIOR TO SUBMITTING SHOP DRAWINGS, AND BEFORE CONSTRUCTION AND FABRICATION OF MATERIALS AND NOTIFY ARCHITECT OF ANY DISCREPANCIES FROM THE INFORMATION PROVIDED IN A TIMELY MANNER.
17. DRAWING INTENT IS TO INDICATE GENERAL ARRANGEMENT, DESIGN AND INTENT OF WORK AND IS PARTIALLY DIAGRAMMATIC. IT SHALL NOT BE SCALED FOR ROUGH-IN MEASUREMENTS, INCLUDING CONSTRUCTION OR FABRICATION. ALL DIMENSIONS FOR BUILT-IN ITEMS SHALL BE BASED ON FIELD DIMENSIONS. CONTRACTOR IS RESPONSIBLE FOR VERIFICATION OF DIMENSIONS.
18. DIMENSIONS, NOTES, FINISHES AND FIXTURES SHOWN ON TYPICAL PLANS, SECTIONS OR DETAILS SHALL APPLY TO SIMILAR, SYMMETRICAL, OR OPPOSITE PLANS, SECTIONS OR DETAILS.
19. SEE WALL TYPE NOTES FOR ADDITIONAL INFORMATION REGARDING TYP. WALL TYPES.
20. REFER TO THE GENERAL SPECIFICATIONS.

VICINITY & LOCATION MAP



VICINITY MAP
NOT TO SCALE



LOCATION MAP
NOT TO SCALE

LEGEND

- BRICK
- CMU
- CONCRETE
- FINISHED WOOD
- ROUGH WOOD
- PLYWOOD
- METAL
- GYPSUM BOARD
- RIGID INSULATION
- BATT INSULATION
- WINDOW OPENING (12)
- DOOR / FRAME SEE SCHEDULE (1-202)
- ROOM NAME / ROOM NUMBER (3042 ROOM NAME, 5F)
- COLUMN REFERENCE (12, G)
- DETAIL NUMBER / SHEET TO LOCATE DETAIL (5 / A5.2)
- DIRECTION OF VIEW
- ELEVATION NUMBER / SHEET TO LOCATE ELEVATION (1 / A3.1)
- DIRECTION OF CUTTING PLANE
- SECTION NUMBER / SHEET TO LOCATE SECTION (2 / A4.1)
- EXTENT OF SECTION CUT
- WALL TYPE (2)
- WALL TYPE, FIRE-RATED (2)
- REVISION NUMBER (3)
- KEY NOTE (N)
- FIN. FLR. ± — HEIGHT INDICATOR (ABOVE FINISHED FLOOR, ABOVE SEA LEVEL)
- INTERIOR ELEVATION KEY: ELEVATION INDICATOR (A, B, C, D / A8.1) — SHEET TO LOCATE ELEVATION — DIRECTION OF VIEW

ABBREVIATIONS

∠	ANGLE	JAN.	JANITOR
ACOUS.	ACOUSTIC	JT.	JOINT
ACT	ACOUSTICAL CEILING TILE	LAM.	LAMINATE
A.D.	AREA DRAIN	LAV.	LAVATORY
ADJ.	ADJUSTABLE	LIN. FT.	LINEAR FEET
A.F.F.	ABOVE FINISHED FLOOR	LG.	LONG
AIR COND.	AIR CONDITIONING	L.L.H.	LONG LEG HORIZONTAL
ALT.	ALTERNATE	L.L.V.	LONG LEG VERTICAL
ALUM.	ALUMINUM		
ANCH.	ANCHORED	MAS.	MASONRY
A.P.	ACCESS PANEL	MATL.	MATERIAL
APPROX.	APPROXIMATE	MAX.	MAXIMUM
ARCH.	ARCHITECT	MECH.	MECHANICAL
		MFGR.	MANUFACTURER
BD.	BOARD	MIN.	MINIMUM
BIT.	BITUMINOUS	MISC.	MISCELLANEOUS
BLDG.	BUILDING	M.O.	MASONRY OPENING
BLK'G	BLOCKING	MTD.	MOUNTED
B.O.F.	BOTTOM OF FOOTING	MTL.	METAL
BOT.	BOTTOM		
BRG.	BEARING	NAT.	NATURAL
		N.I.C.	NOT IN CONTRACT
℄	CENTER LINE	NO.	NUMBER
CAB.	CABINET	NOM.	NOMINAL
C.J.	CONSTRUCTION JOINT	N.T.S.	NOT TO SCALE
CLG.	CEILING		
CLG. HT.	CEILING HEIGHT	O.A.	OVERALL
CLO.	CLOSET	O/C	ON CENTER
CLR.	CLEAR	O.D.	OUTSIDE DIMENSION
CMU	CONCRETE MASONRY UNIT	OH.	OVERHANG
CNTRL. JT.	CONTROL JOINT	O/O	OUT TO OUT
C.O.	CLEAN OUT	OPG.	OPENING
COL.	COLUMN	OPP.	OPPOSITE
CONC.	CONCRETE		
CONT.	CONTINUOUS	PSB	PAINTED GYPSUM BOARD
CORR.	CORRIDOR	PL. P.	PLATE
C.T.	CERAMIC TILE	PLAS. LAM.	PLASTIC LAMINATE
CTR.	CENTER	PLYWD.	PLYWOOD
		POL.	POLISHED
⌀	DIAMETER	PREFAB.	PREFABRICATED
DBL.	DOUBLE	PREFIN.	PREFINISHED
D.F.	DRINKING FOUNTAIN	PR.	PAIR
DIA.	DIAMETER	P.T.	PRESSURE TREATED
DIM.	DIMENSION	PTD.	PAINTED
DR.	DOOR	P.V.C.	POLYVINYL CHLORIDE
DN.	DOWN		
DS.	DOWNSPOUT	R.	RISERS
DTL.	DETAIL	RD.	ROOF DRAIN
DWG.	DRAWING	RECEPT.	RECEPTACLE
		REINF.	REINFORCING
EA.	EACH	REQ'D	REQUIRED
E.J.	EXPANSION JOINT	REV.	REVISED
EL., ELEV.	ELEVATION	RM.	ROOM
ELEC.	ELECTRIC	R.O.	ROUGH OPENING
EQ.	EQUAL		
EQUIP.	EQUIPMENT	SCHED.	SCHEDULE
E.W.	EACH WAY	SECT.	SECTION
E.W.C.	ELECTRIC WATER COOLER	SHT.	SHEET
EX., EXIST.	EXISTING	SIM.	SIMILAR
EXP.	EXPANSION	S.M.P.	SOLID MASONRY PIER
EXT.	EXTERIOR	SPECS.	SPECIFICATIONS
F.D.	FLOOR DRAIN	SQ.	SQUARE
F.E.	FIRE EXTINGUISHER	ST. STL.	STAINLESS STEEL
F.E.C.	FIRE EXTINGUISHER CABINET	STD.	STANDARD
FIN.	FINISH	STL.	STEEL
FL., FLR.	FLOOR	STOR.	STORAGE
FLUOR.	FLUORESCENT	STRUCT.	STRUCTURAL
F.O.E.X.	FACE OF EXISTING	SUSP.	SUSPENDED
FURR.	FURRING/FURRED	SYM.	SYMMETRICAL
FT. , '	FOOT/FEET		
FTG.	FOOTING	T.	TREAD
		T&G	TONGUE & GROOVE
GA.	GAUGE	TEL.	TELEPHONE
GALV.	GALVANIZED	THK.	THICKNESS
G.C.	GENERAL CONTRACTOR	THRU.	THROUGH
GL.	GLASS	T.O.S.	TOP OF SLAB
GRD.	GRADE	T.O.STL.	TOP OF STEEL
GYP. BD., GWB	GYPSUM WALL BOARD	TYP.	TYPICAL
		U.O.N.	UNLESS OTHERWISE NOTED
H.C.	HANDICAPPED	VAR.	VARIES
H.B.	HOSE BIB	V.G.T.	VINYL COMPOSITION TILE
HDW.	HARDWARE	VERT.	VERTICAL
H.M.	HOLLOW METAL	VEST.	VESTIBULE
HORIZ.	HORIZONTAL	V.I.F.	VERIFY IN FIELD
HT.	HEIGHT	V.W.C.	VINYL WALL COVERING
HVAC	HEATING, VENTILATION & AIR CONDITIONING	W	WITH
I.D.	INSIDE DIAMETER	W.	WIDTH
IN., "	INCHES	WD.	WOOD
INFO.	INFORMATION	WDW.	WINDOW
INSUL.	INSULATION	WGT., WT.	WEIGHT
INT.	INTERIOR	W/O	WITHOUT
		WP.	WEATHERPROOF
		WWF	WELDED WIRE FABRIC

DRAWINGS LIST

SCOPE OF WORK - BASE BID AND ALTERNATES

THIS PROJECT CONSISTS OF INTERIOR RENOVATIONS TO AN EXISTING SCHOOL FOR A NEW SECURITY VESTIBULE. THE DESIGN IS INTENDED RECONFIGURE EXISTING ENTRANCE TO CREATE A SECURED VESTIBULE TO DIRECT ALL VISITORS TO THE MAIN OFFICE.

BASE BID IMPROVEMENTS TO THE SPACE ARE LIMITED TO INTERIOR WORK AND INCLUDE ALL OR MOST OF THE FOLLOWING ASPECTS:

SELECTIVE DEMOLITION - PROJECT INCLUDES REMOVAL OF EXISTING NON-BEARING STUD PARTITIONS AND/OR MASONRY WALLS, DOORS, FRAMES, HARDWARE, INTERIOR WINDOWS, CEILINGS, AND OTHER FINISH SYSTEM COMPONENTS.

CARPENTRY AND GENERAL TRADES - THE PROJECT REQUIRES INSTALLATION OF NEW DOORS AND HARDWARE.

DOORS AND WINDOWS - THE PROJECT INCLUDES RETROFIT OF EXISTING AND/OR INSTALLATION OF NEW STOREFRONT DOORS, FRAMES, AND HARDWARE.

STRUCTURAL - THE PROJECT INCLUDES INSTALLATION OF NEW STEEL TUBE ABOVE STOREFRONT AT CROSS CORRIDOR DOORS.

FINISHES - THE PROJECT REQUIRES RETROFIT OF EXISTING FINISHES AND INSTALLATION OF NEW FLOOR AND CEILING FINISH SYSTEMS IN THE WORK AREA SHOWN. THE PROJECT ALSO REQUIRES WALL PAINTING INCLUDING EXISTING WALLS AND TRIM IMMEDIATELY ADJACENT TO THE WORK AREA.

SPRINKLER SYSTEM - THE BUILDING IS EQUIPPED WITH A SPRINKLER SYSTEM THAT WILL REQUIRE RETROFIT TO ACCOMMODATE THE NEW STOREFRONT LAYOUT. THE SCOPE OF SPRINKLER WORK IS EXPECTED TO BE LIMITED TO ADJUSTING HEAD LOCATIONS AND ADDING HEADS WHERE NECESSARY. ALL PIPING ABOVE THE CEILING IS TO BE PLENUM RATED.

MECHANICAL - THE PROJECT REQUIRES THE RETROFIT OF THE EXISTING HEATING AND COOLING SYSTEM INCLUDING ADJUSTMENTS TO BALANCING. THE SYSTEM IS CONFIGURED WITH DUCTED SUPPLY AND PLENUM RETURN.

ELECTRICAL - THE PROJECT INCLUDES RETROFIT OF EXISTING AND INSTALLATION OF NEW LOW VOLTAGE ACCESS CONTROL DEVICES AS WELL AS NEW LIGHTING, NEW POWER/DATA DISTRIBUTION AND DEVICES, NEW WIRING AND RACEWAYS AND NEW SOUND SYSTEM. RELOCATE EXISTING CARD READER. ALL WIRING ABOVE THE CEILING IS TO BE PLENUM RATED.

NO SITE WORK OR UTILITY WORK IS INCLUDED.
NO CONCRETE WORK IS INCLUDED.
NO MASONRY WORK IS INCLUDED.
NO PLUMBING WORK IS INCLUDED.
NO EXTERIOR ENVELOPE WORK OR ROOF WORK IS INCLUDED.

ALTERNATE #1A — INCLUDES ADDING ELECTRONIC HARDWARE AND TIMERS AT NEW CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE. ELECTRONIC HARDWARE TO BE PROGRAMMED VIA THE FCPS SECURITY SYSTEM TO CONTROL THE LOCK AND UNLOCK OF NEW CORRIDOR DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. NO CARD READERS ARE INCLUDED.

ALTERNATE #1B — INCLUDES ADDING CARD READERS AT BOTH SIDES OF NEW CORRIDOR DOORS NOTED ON THE FLOOR PLAN AND DOOR SCHEDULE.

ADA MANEUVERING CLEARANCES AT DOORS

SCALE: 1/4" = 1'-0"

NOTE: '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN' FIGURE NUMBERS REFERENCED, FOR ADDITIONAL INFORMATION REFER TO THE FULL '2010 ADA STANDARDS FOR ACCESSIBLE DESIGN'.

4 2 0 2 4 6 8
SCALE FEET

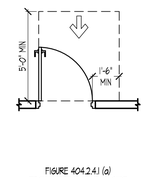


FIGURE 404.2.4.1 (a)
FRONT APPROACH, PULL SIDE

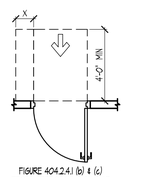


FIGURE 404.2.4.1 (b) & (c)
FRONT APPROACH, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH)

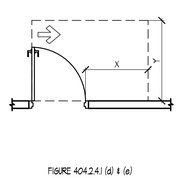


FIGURE 404.2.4.1 (d) & (e)
HINGE APPROACH, PULL SIDE
(NOTE: X = 36" IF Y = 60" OR X = 42" IF Y = 54")

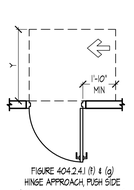


FIGURE 404.2.4.1 (f) & (g)
HINGE APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH BOTH A CLOSER & A LATCH, THEN Y = 48")

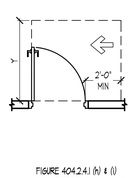


FIGURE 404.2.4.1 (h) & (i)
LATCH APPROACH, PULL SIDE
(NOTE: Y = 48" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 54")

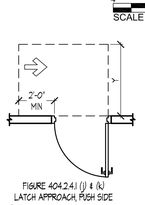


FIGURE 404.2.4.1 (j) & (k)
LATCH APPROACH, PUSH SIDE
(NOTE: Y = 42" UNLESS DOOR IS PROVIDED WITH A CLOSER, THEN Y = 48")

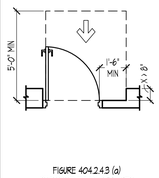


FIGURE 404.2.4.3 (a)
RECESSED DOOR, PULL SIDE

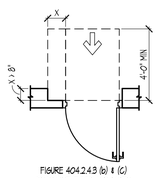


FIGURE 404.2.4.3 (b) & (c)
RECESSED DOOR, PUSH SIDE
(NOTE: X = 12" IF DOOR IS PROVIDED WITH BOTH CLOSER & LATCH)

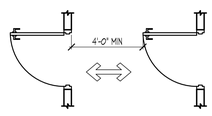


FIGURE 404.2.6 (a)
DOORS & GATES IN A SERIES

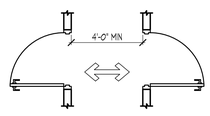


FIGURE 404.2.6 (b)
DOORS & GATES IN A SERIES

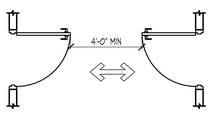


FIGURE 404.2.6 (c)
DOORS & GATES IN A SERIES

Proffitt & Assoc. ARCHITECTS
49 SOUTH CARROLL STREET
FREDERICK, MARYLAND 21701
PHONE (301) 662-8532
FAX (301) 662-4192
info@proffittandassociates.com

I CERTIFY THAT THESE DOCUMENTS WERE PREPARED OR APPROVED BY ME, AND THAT I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF MARYLAND.
LICENSE No. 14510
EXPIRATION DATE 03-07-2020

NEW SECURITY VESTIBULE RENOVATIONS FOR:
CATOCTIN HIGH SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
14745 SABILLASVILLE ROAD
THURMONT, MARYLAND 21788

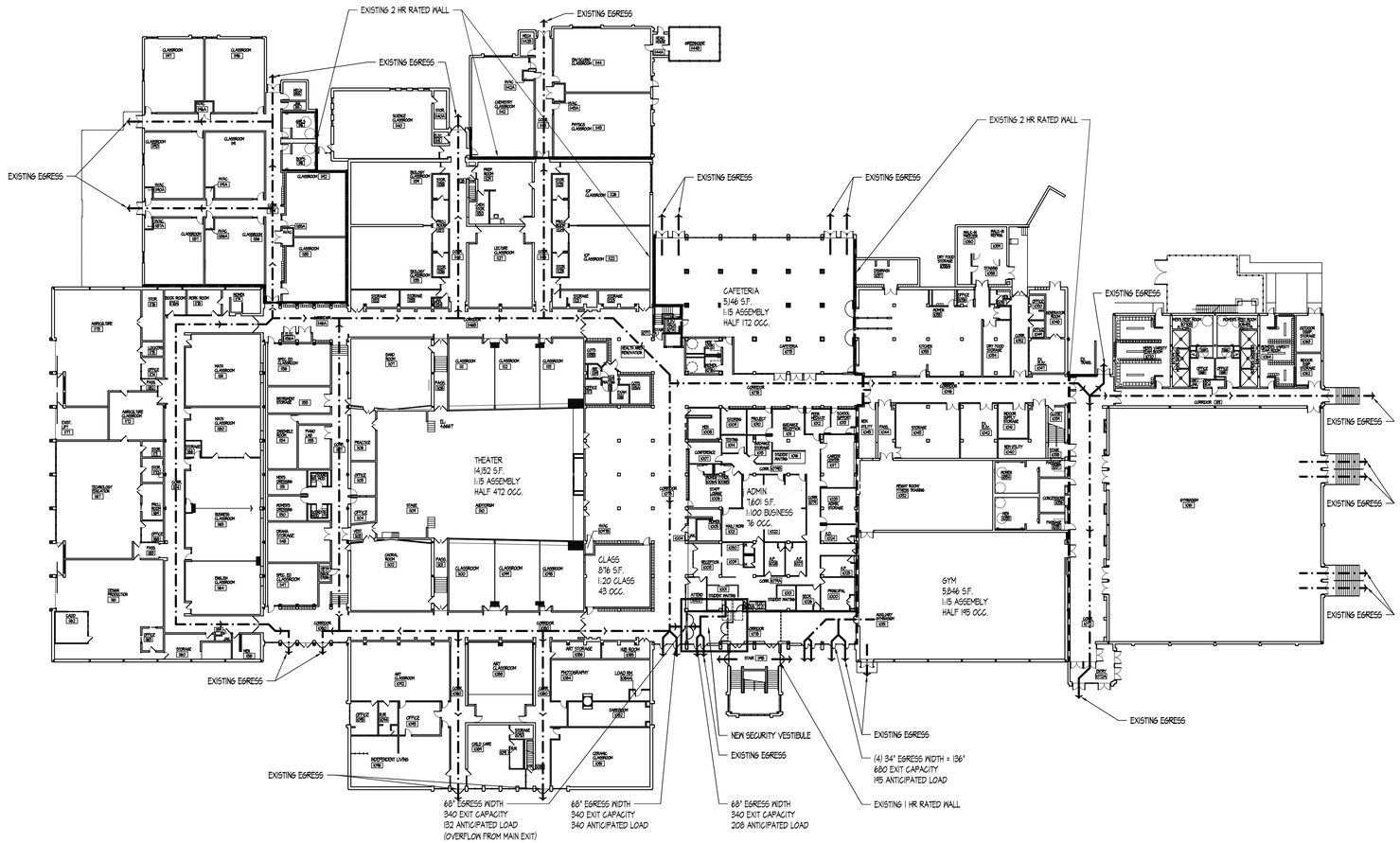
ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.03
DATE: 08-04-2017

COVER SHEET

A0.1



1 CA1.1

EGRESS FLOOR PLAN

SCALE: 1/32" = 1'-0"

32 16 0 16 32 48 64
SCALE FEET

TRUE NORTH PLAN NORTH

NOTE: THIS EGRESS PLAN IS PROVIDED FOR ILLUSTRATIVE PURPOSES ONLY TO INDICATE THE LOCATION OF ALL MAIN POINTS OF EGRESS FROM THE BUILDING'S LEVEL OF EXIT DISCHARGE. ALTHOUGH NO OCCUPANT LOAD OR EXIT CAPACITY CALCULATIONS WERE PERFORMED, NO INCREASE OR DECEASE IN OCCUPANT LOAD WILL RESULT FROM THESE MODIFICATIONS. SIMILARLY, THE IMPROVEMENTS FOR THE SECURITY VESTIBULE AT THE MAIN ENTRANCE WILL IN NO WAY COMPROMISE OR REDUCE THE EGRESS CAPACITY THROUGH THE MAIN ENTRANCE WHEN CONSIDERED AS A POINT OF EGRESS.

CODE ANALYSIS:

REFERENCE IBC 2015

IBC CONSTRUCTION CLASSIFICATION: 2B — IBC USE GROUP E: EDUCATIONAL

ALLOWABLE HEIGHT & AREA CALCULATIONS:
(PER TABLES 504.3, 504.4 & 506.2, SPRINKLERED)
- ALLOWABLE AREA PERMITTED PER FLOOR: 58,000 S.F.
- ALLOWABLE BUILDING HEIGHT (ABOVE GRADE PLANE): 3 STORIES (75'-0")

ACTUAL HEIGHT & AREA CALCULATIONS:
- TOTAL ACTUAL EXISTING FOOTPRINT (COMBINED 5 FIRE AREAS): 141,950 S.F.
- TOTAL ACTUAL HEIGHT (ABOVE GRADE PLANE): 2 STORY (24'-8")

NOTE: NO ADDITIONS OR INCREASE IN AREA OR OCCUPANT LOAD TO EXISTING BUILDING.

NOTES:

NO PROPOSED BUILDING ADDITIONS OR INCREASE IN OCCUPANT LOAD WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS. NO CHANGES TO EXISTING EGRESS CAPACITY OR EXISTING PLUMBING FIXTURES WILL RESULT FROM THE SECURITY VESTIBULE MODIFICATIONS.

BUILDING CODE REQUIREMENTS:

NOTE: REQUIREMENTS 'X'ED OUT ARE LESS STRINGENT. MORE STRINGENT REQUIREMENTS ARE USED.

	REQUIRED	
ITEM	IBC 2015	NFPA-101 2015
EXTERIOR WALLS (LOAD-BEARING)	PER TABLE 601 & 602: X > 30' FIRE SEPARATION DIST. 0 HOURS	
EXTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601 & 602: X > 30' FIRE SEPARATION DIST. 0 HOURS	
PRIMARY STRUCTURAL FRAME	PER TABLE 601: 0 HOURS	
FLOOR CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
ROOF CONSTRUCTION & SECONDARY MEMBERS	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (LOAD-BEARING)	PER TABLE 601: 0 HOURS	
INTERIOR WALLS (NON-LOAD-BEARING)	PER TABLE 601: 0 HOURS	
FIRE WALLS	PER TABLE 706.4, EXC A: 2 HOURS	PER SECTION 7.2.4.3: 2 HOURS
FIRE PARTITIONS	PER SECTION 708.3: 1 HOUR	PER SECTION 15.3.6 (2): NO SPECIAL REQUIREMENTS
CORRIDORS	PER TABLE 1020.1: 0 HOURS W/ SPRINKLER SYSTEM	PER SECTION 15.3.6 (2): 0 HOURS W/ SPRINKLER SYSTEM
DEAD END CORRIDORS	PER SECTION 1020.4, EXC 2: 50' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.5.2: 50' MAX W/ SPRINKLER SYSTEM
COMMON PATH OF TRAVEL	PER SECTION 1006.2.1: 75' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.5.3.1: 100' MAX W/ SPRINKLER SYSTEM
EXIT ACCESS TRAVEL	PER TABLE 1017.2: 250' MAX W/ SPRINKLER SYSTEM	PER SECTION 15.2.6.3: 300' MAX W/ SPRINKLER SYSTEM
REMOTENESS	PER SECTION 1007.1.1(2): 1/3 OF DIAG. DISTANCE	PER SECTION 7.5.1.3.3: 1/3 OF DIAG. DISTANCE
CORRIDOR WIDTH	PER SECTION 1020.2: 44" W/ CAPACITY < 100 72" W/ CAPACITY ≥ 100	PER SECTION 15.2.3.2: 72" EXIT ACCESS CORRIDORS
	PER SECTION 1005.3.2: 0.2" PER OCCUPANT	PER TABLE 7.3.3.1: 0.2" PER OCCUPANT
STAIRWAY WIDTH	PER SECTION 1011.2: 36" W/ CAPACITY < 50 44" W/ CAPACITY ≥ 50	PER TABLE 7.2.2.2.1.2(B): TOTAL CUMULATIVE OCC. LOAD: 44" W/ CAPACITY < 2000 56" W/ CAPACITY > 2000
	PER SECTION 1005.3.1: 0.3" PER OCCUPANT	PER TABLE 7.3.3.1: 0.3" PER OCCUPANT

APPLICABLE BUILDING CODES:

AUTHORITY HAVING JURISDICTION: FREDERICK COUNTY, MARYLAND

1. BUILDING CODE:	2015 INTERNATIONAL BUILDING CODE (IBC) WITH AMENDMENTS MARYLAND BUILDING REHABILITATION CODE COMAR
2. FIRE CODE:	2015 NFPA 1 FIRE CODE (LSC) W/ AMENDMENTS, PER STATE OF MD FIRE CODE 2015 NFPA 101 LIFE SAFETY CODE (LSC) W/ AMENDMENTS, PER STATE OF MD FIRE CODE STATE OF MARYLAND FIRE PREVENTION CODE
3. MECHANICAL:	2015 INTERNATIONAL MECHANICAL CODE (IMC)
4. ENERGY:	2015 INTERNATIONAL ENERGY CONSERVATION CODE (IECC)
5. GAS:	2015 INTERNATIONAL FUEL GAS CODE (IFGC) WITH AMENDMENTS
6. PLUMBING:	2015 INTERNATIONAL PLUMBING CODE (IPC) WITH AMENDMENTS
9. ELECTRICAL:	2014 NATIONAL ELECTRIC CODE (NEC)
10.ACCESSIBILITY:	2015 IBC EXCEPT WHERE THE PROVISIONS OF THE MARYLAND ACCESSIBILITY CODE (COMAR.05.02.02) ARE MORE STRINGENT & 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN (2010 STANDARDS)

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LICENSE No. 14510
EXPIRATION DATE 03-07-2020

NEW SECURITY VESTIBULE RENOVATIONS FOR:
CATOCTIN HIGH SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
14745 SABILLASVILLE ROAD
THURMONT, MARYLAND 21788

ISSUE

REV	DATE	DESCRIPTION
	05/15/18	PERMIT SET

PROJECT NO.: 15-30.03
DATE: 08-04-2017

CODE ANALYSIS & EGRESS FLOOR PLAN

CA1.1

TYPICAL DEMOLITION GENERAL NOTES:

1. AREAS OF DEMOLITION DENOTED BY DASHED LINES.
2. THE CONTRACTOR SHALL RETURN ALL SALVAGEABLE MATERIAL AND/OR EQUIPMENT NOTED TO BE REMOVED ON SHEET A1.1 TO THE OWNER. THE OWNER SHALL STORE SALVAGEABLE MATERIAL AND/OR EQUIPMENT AT THEIR DISCRETION. THE CONTRACTOR SHALL DISPOSE OF ALL NON-SALVAGEABLE MATERIALS IN ACCORDANCE WITH OWNER'S RECOMMENDATIONS AND LOCAL ZONING CODES.
3. THE CONTRACTOR SHALL CONSULT WITH THE ARCHITECT ON ANY CONCEALED CONDITIONS UNCOVERED DURING DEMOLITION THAT IMPEDES THE EXECUTION OF THE DESIGN AS INDICATED ON THE DRAWINGS.
4. ALL AREAS OF DEMOLITION SHALL BE PATCHED OR REPAIRED AS REQUIRED.
5. COORDINATE DEMOLITION WITH PROPOSED NEW CONSTRUCTION INCLUDING CEILINGS, LIGHTS, POWER, DATA, SPRINKLER HEADS, WALLS, DOORS, FRAMES, HARDWARE, FINISHES, CONCRETE SLABS, ETC.
6. THE CONTRACTOR SHALL BE RESPONSIBLE TO TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN THE STRUCTURAL INTEGRITY OF THE BUILDING AT ALL TIMES AND TO PROVIDE AND BE RESPONSIBLE FOR SHORING AND BRACING REQUIRED THROUGHOUT THE CONSTRUCTION PERIOD.
7. ANY ITEMS NOT NOTED TO BE DEMOLISHED, BUT REQUIRING REMOVAL IN ORDER TO ACCOMPLISH THE REQUIRED DEMOLITION WORK, SHALL BE REINSTALLED OR REPLACED IN KIND IN LOCATION DIRECTED BY OWNER UPON COMPLETION OF THE NEW CONSTRUCTION UNLESS OTHERWISE NOTED.
8. JOB SITE SAFETY SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
9. ANY AREAS DAMAGED BY THE DEMOLITION AND/OR CONSTRUCTION WORK SHALL BE REPAIRED AND/OR RECEIVE NEW SUBSTRATES, FINISHES, AND/OR MATERIALS TO MATCH THE EXISTING AFFECTED ITEMS. ANY REPAIR OR REPLACEMENT WORK SHALL BE PERFORMED TO A LEVEL OF QUALITY EQUAL TO THAT FOUND PRIOR TO BEGINNING WORK ON THIS PROJECT.
10. THE SELECTIVE DEMOLITION AS SHOWN ON THE DRAWINGS IS DIAGRAMMATIC, AND IN NO WAY ATTEMPTS TO SHOW ALL EXISTING FIXTURES, CONNECTIONS AND FITTINGS, AND OTHER MISCELLANEOUS ITEMS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING/COORDINATING ALL MISCELLANEOUS DEMOLITION AS REQUIRED DUE TO FIELD CONDITIONS.
11. THE CONTRACTOR SHALL BE RESPONSIBLE TO CONTROL THE CONTAINMENT OF DUST AND DEBRIS DURING THE DEMOLITION PERIOD AND SHALL OBTAIN ALL REQUIRED PERMITS AND COORDINATE WITH THE COUNTY BUILDING DEPARTMENT THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD. DAILY SITE CLEANING WILL BE REQUIRED WITH ADDITIONAL CLEANING IF REQUIRED BY THE AUTHORITIES HAVING JURISDICTION.
12. PRIOR TO BEGINNING DEMOLITION, THE CONTRACTOR SHALL SUBMIT TO THE OWNER A DEMOLITION PLAN OUTLINING THE DESIRED PLACEMENT OF DUMPSTERS, DUST AND DEBRIS CONTROL MEASURES AND SCHEDULE OF ACTIVITIES. THE CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO EACH DEMOLITION ACTIVITY.
13. PROVIDE TEMPORARY COVER OR PARTITIONS TO PROTECT EXIST. BUILDING DURING CONSTRUCTION FROM EXPOSURE TO AND DAMAGE FROM THE ELEMENTS.
14. EXISTING FINISHES SPECIFICALLY NOT CALLED OUT TO BE REMOVED ARE TO REMAIN (PAINT, FLOORING, ETC.). PREPARE EXISTING SURFACES FOR APPLICATION OF NEW FINISHES AS REQUIRED BY MANUFACTURER RECOMMENDATIONS.
15. SEE MECHANICAL, PLUMBING, & ELECTRICAL DRAWINGS FOR ADDITIONAL DEMOLITION INFORMATION.

SELECTIVE DEMOLITION NOTES:

1. REMOVE EXISTING HOLLOW METAL FRAME AND GLAZING. REMOVE EXISTING MASONRY WALL BELOW HOLLOW METAL FRAME. PREP EXISTING OPENING FOR NEW STOREFRONT. PROTECT, PATCH AND REPAIR ADJACENT SURFACES SHOWN TO REMAIN, INCLUDING WALLS, FLOORING AND CEILING TILES AND GRID, AS REQUIRED TO MATCH EXISTING CONDITIONS, UNLESS OTHERWISE NOTED.
2. REMOVE & SALVAGE EXISTING FURNISHINGS, INCLUDING DESKS AND SHELVING. REPAIR & PATCH ADJACENT SURFACES SHOWN TO REMAIN AND PREP TO RECEIVE NEW FINISHES. COORDINATE RELOCATION W/ FF&S.
3. REMOVE AND RELOCATE EXISTING SURFACE MOUNTED FIRE ALARM PULL STATION, EXIT SIGN AND WIRE WAY. SEE PROPOSED FLOOR PLANS AND ELECTRICAL DRAWINGS FOR NEW LOCATION. PATCH AND REPAIR ADJACENT SURFACES TO MATCH EXISTING CONDITIONS.
4. REMOVE AND RELOCATE EXISTING SURFACE MOUNTED CARD READER STATION. SEE PROPOSED FLOOR PLANS AND ELECTRICAL DRAWINGS FOR NEW LOCATION. PATCH AND REPAIR ADJACENT SURFACES TO MATCH EXISTING CONDITIONS.
5. REMOVE AND RELOCATE EXISTING SURFACE MOUNTED SEGURITY ALARM PANEL AND WIRE WAY. SEE PROPOSED FLOOR PLANS AND ELECTRICAL DRAWINGS FOR NEW LOCATION. PATCH AND REPAIR ADJACENT SURFACES TO MATCH EXISTING CONDITIONS.

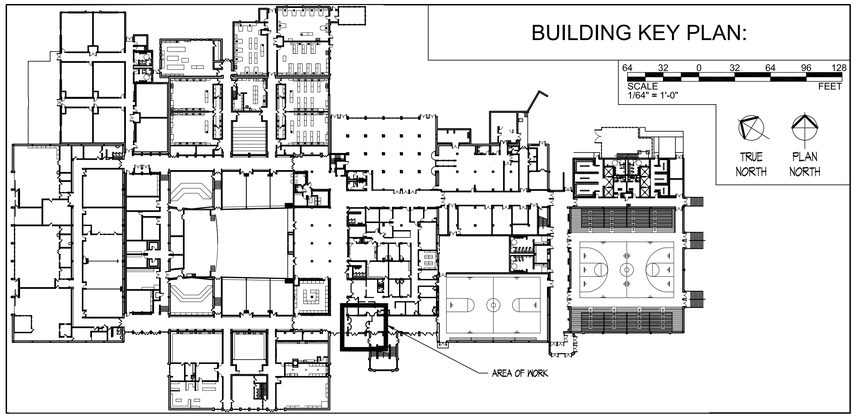
DEMOLITION KEY:

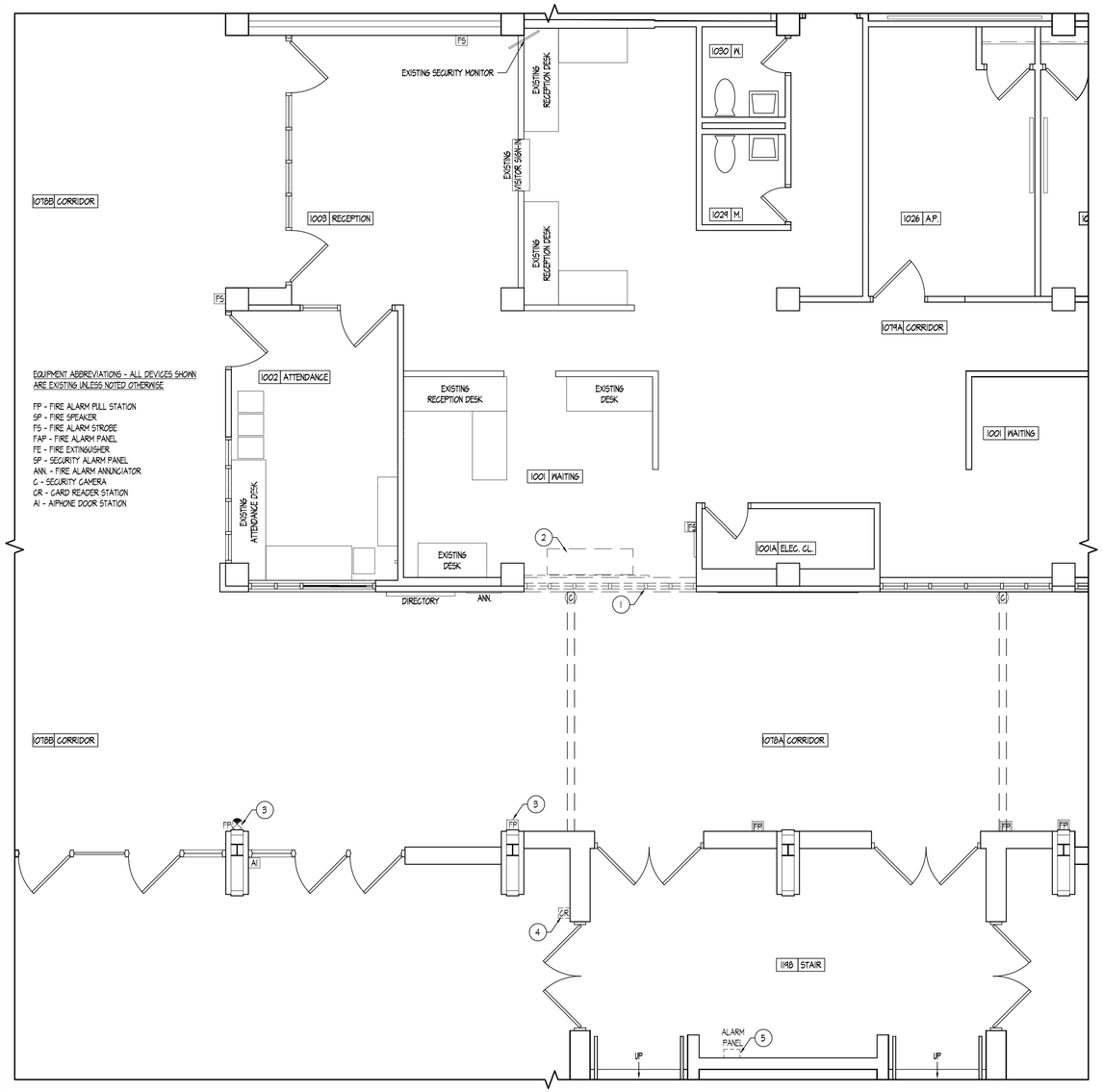
- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- WALL TO BE REMOVED
- WINDOW TO BE REMOVED
- DOOR AND FRAME TO BE REMOVED

PROPOSED KEY:

- EXISTING WALL TO REMAIN
- EXISTING WINDOW TO REMAIN
- EXISTING DOOR AND FRAME TO REMAIN
- NEW WALL
- NEW DOOR AND FRAME
- NEW STOREFRONT

BUILDING KEY PLAN:



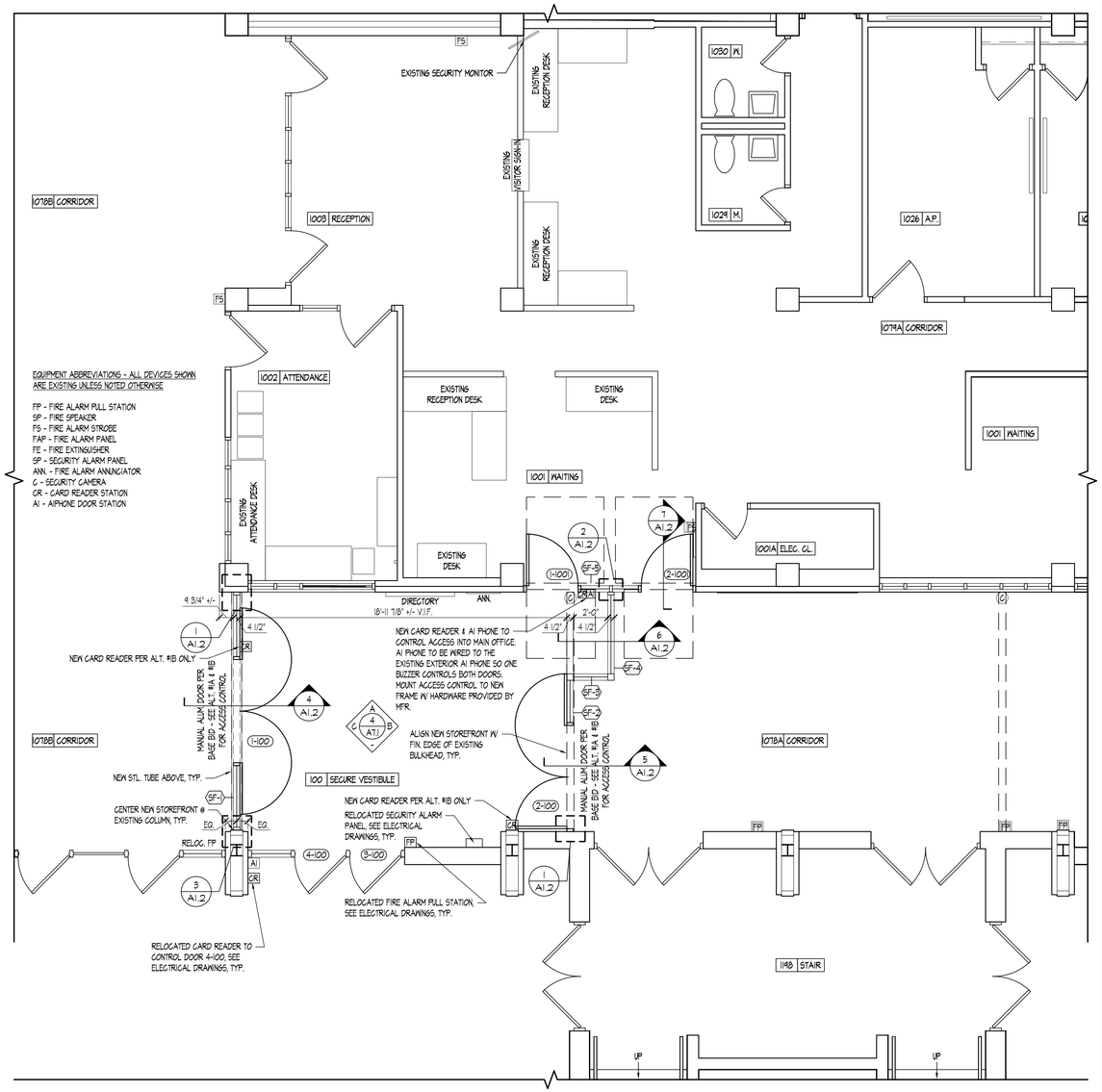


1 A1.1 EXISTING / DEMOLITION FLOOR PLAN

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8 SCALE FEET

TRUE NORTH PLAN NORTH



2 A1.1 PROPOSED FLOOR PLAN

SCALE: 1/4" = 1'-0"

4 2 0 2 4 6 8 SCALE FEET

TRUE NORTH PLAN NORTH

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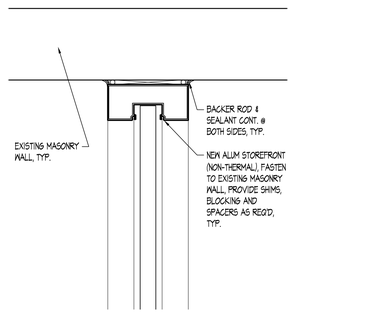
EXISTING / DEMOLITION & PROPOSED FLOOR PLANS

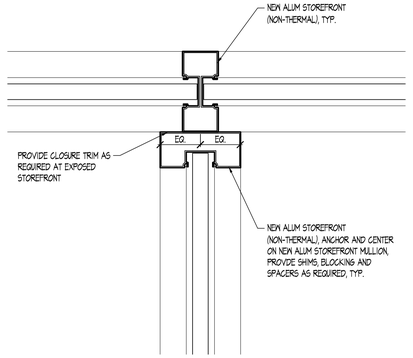
A1.1



1 A1.2 PLAN DETAIL

SCALE: 3" = 1'-0"

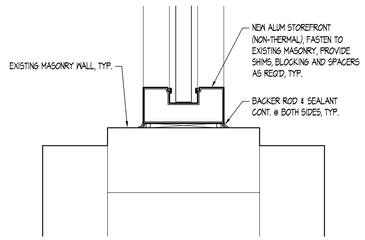
SCALE 0 1/2 1 FEET



2 A1.2 PLAN DETAIL

SCALE: 3" = 1'-0"

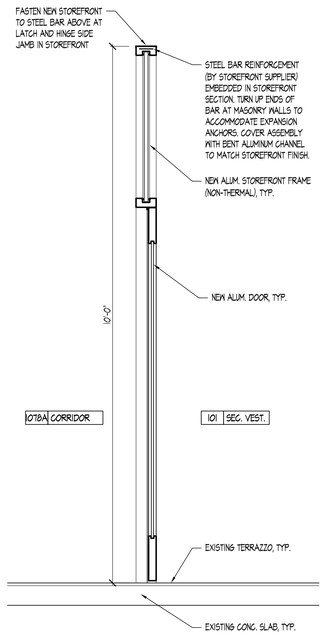
SCALE 0 1/2 1 FEET



3 A1.2 PLAN DETAIL

SCALE: 3" = 1'-0"

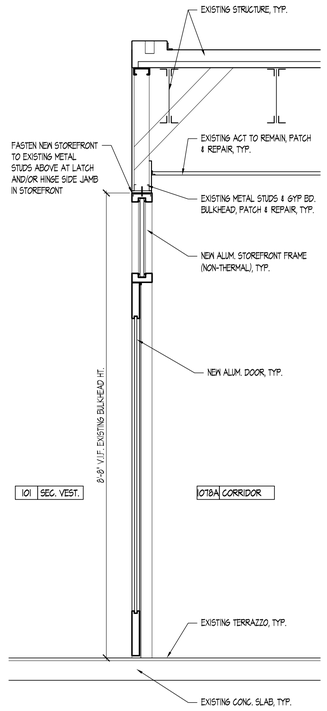
SCALE 0 1/2 1 FEET



4 A1.2 WALL SECTION

SCALE: 3/4" = 1'-0"

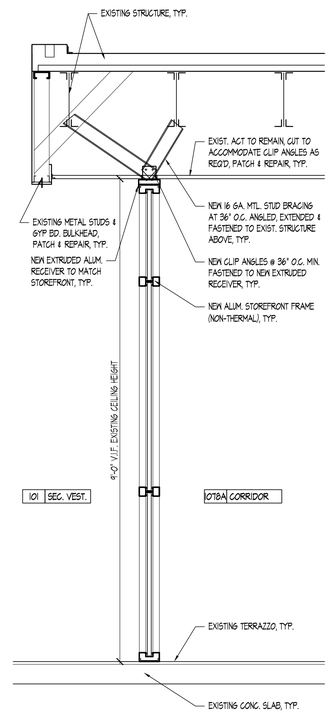
SCALE 1 0 1 2 3 FEET



5 A1.2 WALL SECTION

SCALE: 3/4" = 1'-0"

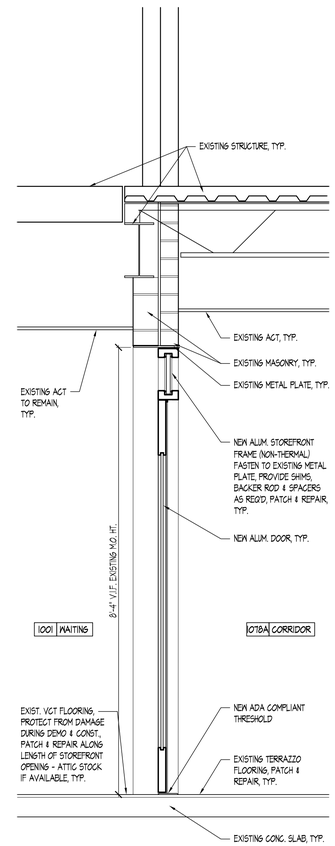
SCALE 1 0 1 2 3 FEET



6 A1.2 WALL SECTION

SCALE: 3/4" = 1'-0"

SCALE 1 0 1 2 3 FEET



7 A1.2 WALL SECTION

SCALE: 3/4" = 1'-0"

SCALE 1 0 1 2 3 FEET

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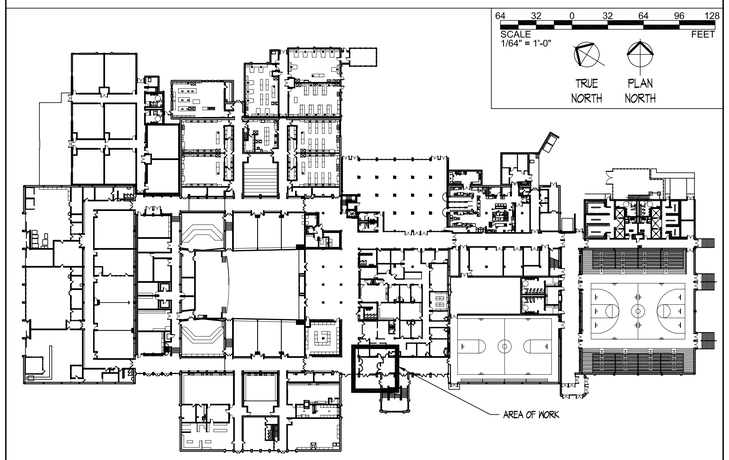
PROPOSED PLAN DETAILS & WALL SECTIONS

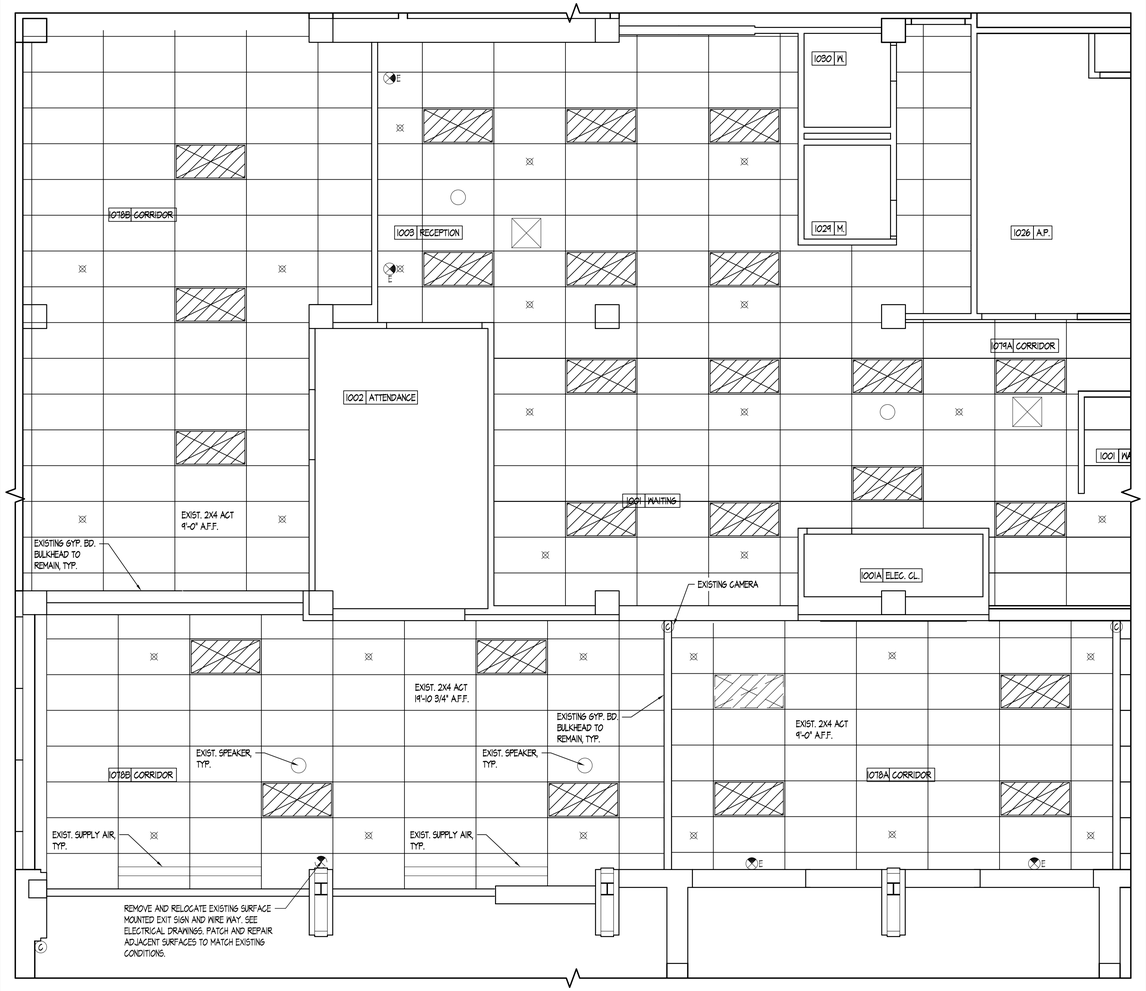
A1.2

PROPOSED REFLECTED CEILING KEY:

- EXISTING 2'-0" x 4'-0" CEILING GRID W/ NEW ACOUSTICAL CEILING TILE
- EXISTING 2'-0" x 4'-0" FLUORESCENT LIGHT FIXTURE TO REMAIN
- EXISTING 2'-0" x 4'-0" LIGHT FIXTURE TO BE REMOVED & SALVAGED FOR RE-USE
- RELOC. — SALVAGED EXISTING 2'-0" x 4'-0" LIGHT FIXTURE IN NEW LOCATION
- EXISTING RECESSED LIGHT FIXTURE TO REMAIN
- EXISTING DIFFUSER TO REMAIN
- MOVE EXISTING DIFFUSER TO NEW LOCATION
- E — EXISTING EXIT DEVICE
- N — NEW EXIT DEVICE
- EXISTING SPRINKLER HEAD

BUILDING KEY PLAN:



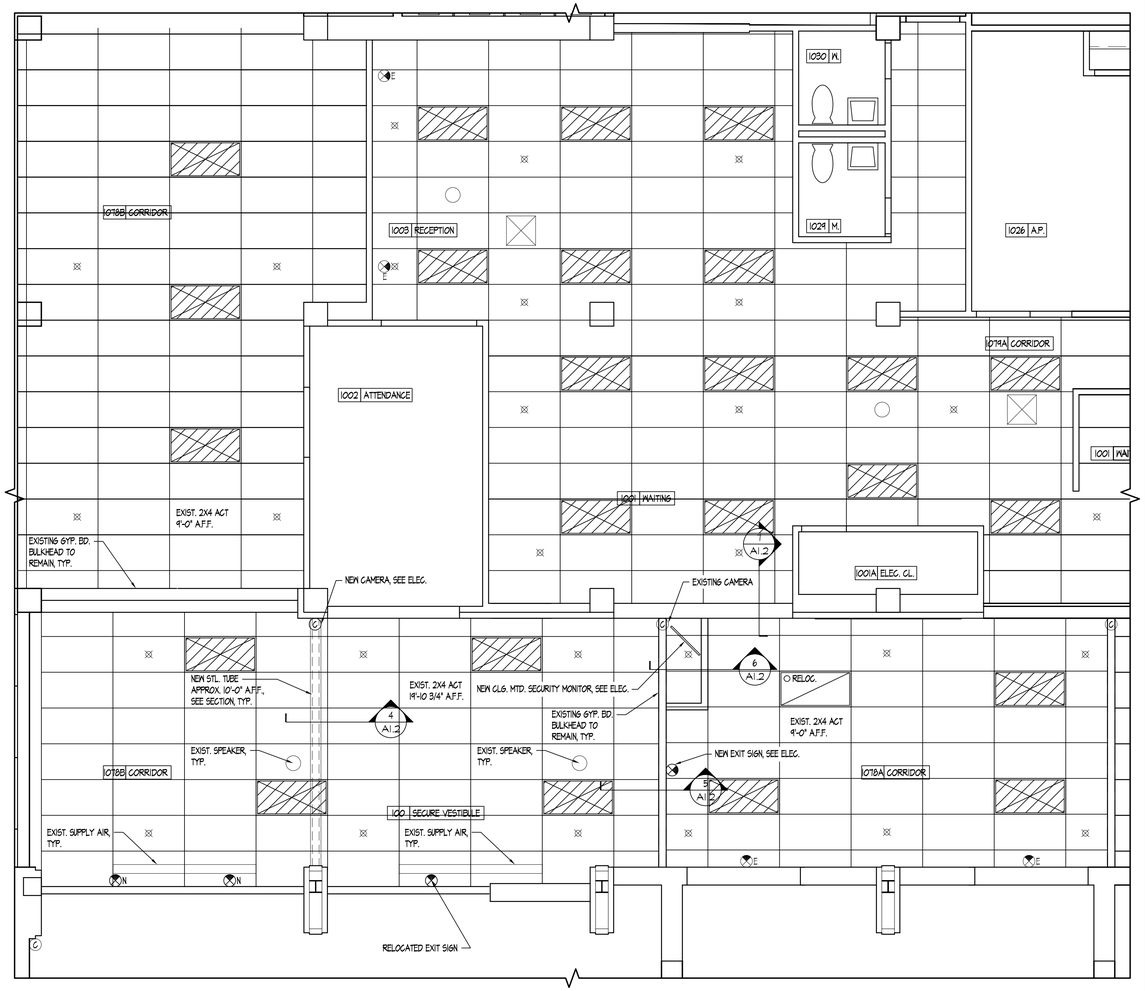


1 / A6.1 EXISTING / DEMOLITION REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET

TRUE NORTH PLAN NORTH



2 / A6.1 PROPOSED REFLECTED CEILING PLAN

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET

TRUE NORTH PLAN NORTH

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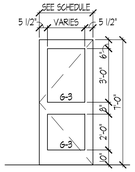
EXISTING / DEMO. & PROPOSED REFLECTED CEILING PLANS

A6.1

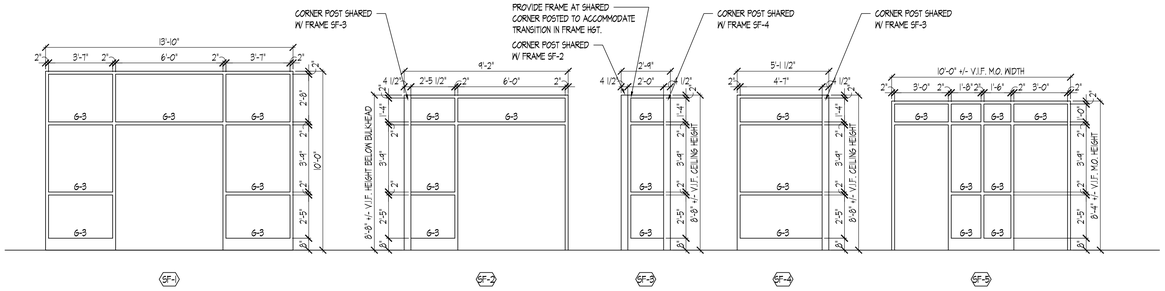


1

1 A7.1 DOOR TYPES

SCALE: 1/4" = 1'-0"

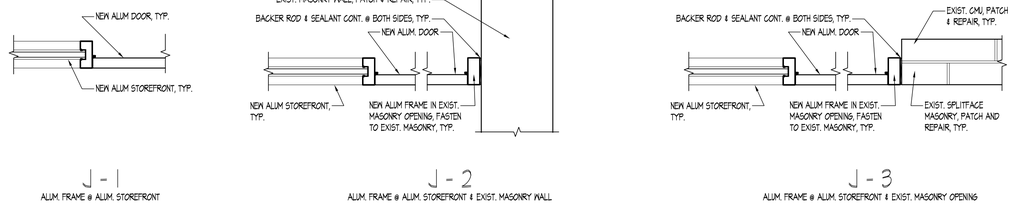
SCALE 4 2 0 2 4 6 8 FEET



2 A7.1 FRAME & STOREFRONT TYPES

SCALE: 1/4" = 1'-0"

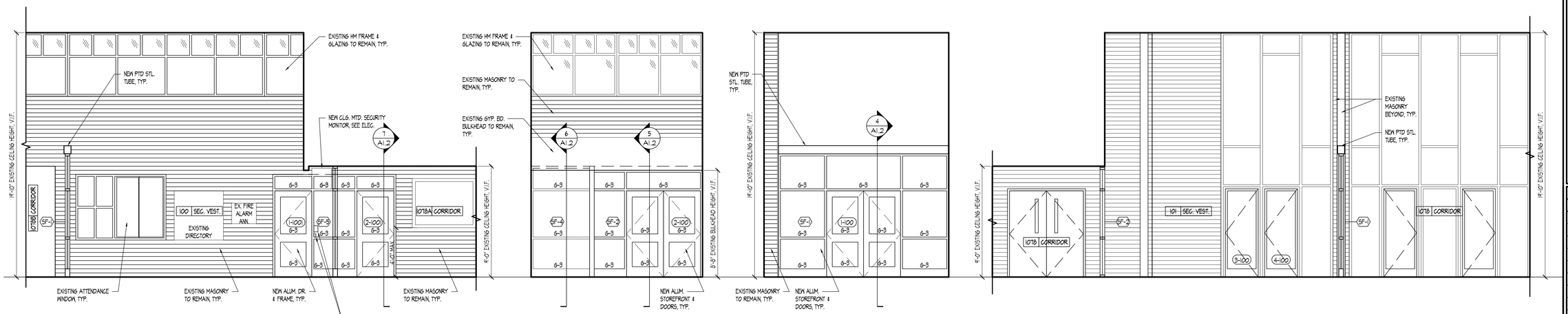
SCALE 4 2 0 2 4 6 8 FEET



3 A7.1 JAMB TYPES

SCALE: 1" = 1'-0"

SCALE 1 1/2 0 1/2 1 1-1/2 2 FEET



4 A7.1 INTERIOR ELEVATIONS

SCALE: 1/4" = 1'-0"

SCALE 4 2 0 2 4 6 8 FEET

DOOR SCHEDULE

OPENING NUMBER	SIZE			DOOR			FRAME			JAMB TYPE	HEAD TYPE	HARDWARE SET	REMARKS
	WIDTH	HEIGHT	THICKNESS	TYPE	MATERIAL	FINISH	TYPE	MATERIAL	FINISH				
1-100	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-1	ALUM.	PREFIN.	J - 1	4 / A1.2	HW # 1 (BASE BID *)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALT. #1B
2-100	(2) 3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-2	ALUM.	PREFIN.	J - 2	5 / A1.2	HW # 1 (BASE BID *)	* PROVIDE HW #1A PER ALTERNATE #1A AND/OR TO HW #1B PER ALT. #1B
3-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	EXIST.	EXIST.	-
4-100	EXIST.	EXIST.	EXIST.	EXIST.	-	-	EXIST.	-	-	EXIST.	EXIST.	HW # 4	RETROFIT FOR RELOCATED CARD READER
1-1001	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-5	ALUM.	PREFIN.	J - 3	T / A1.2	HW # 2	-
1-1002	3'-0"	7'-0"	1-3/4"	1	ALUM.	PREFIN.	SF-5	ALUM.	PREFIN.	J - 3	T / A1.2	HW # 3	-

* BASE BID - SECURED NON-ELECTRIFIED HARDWARE
ADD ALT. #1A - ELEC. LATCH RETRACTION TIMED WITH CLASS CHANGES
ADD ALT. #1B - ELEC. LATCH RETRACTION TIMED WITH CLASS CHANGES AND ACTIVATED BY CARD READER

ROOM FINISH SCHEDULE

ROOM NUMBER	ROOM NAME	FLOORS		WALLS								CEILING		REMARKS
				SOUTH		WEST		NORTH		EAST				
		MATERIAL	BASE	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	FINISH	MATERIAL	HEIGHT	
100	SECURE VESTIBULE	EXIST.	EXIST.	EXIST.	-	SF-1/ MTL. TUBE	PREFIN./ PTD-2	SF-5 / EXIST.	PREFIN. / EXIST.	SF-2 / SF-3 / SF-4 / EXIST.	PREFIN. / PTD-1	EXIST.	-	-
100I	WAITING	EXIST. / VCT-1 *	EXIST. / RB-1 *	EXIST. / SF-5	EXIST. / PREFIN.	EXIST.	-	EXIST.	-	EXIST.	-	EXIST. *	-	* PATCH & REPAIR EXISTING CEILING, VCT/BASE @ NEW STOREFRONT
107BA	CORRIDOR	EXIST.	EXIST.	EXIST.	-	SF-2 / SF-3 / SF-4 / EXIST.	PREFIN. / PTD-1	SF-5 / EXIST.	PREFIN. / EXIST.	EXIST.	-	EXIST. **	-	** PATCH & REPAIR EXISTING CEILING @ NEW STOREFRONT
107BB	CORRIDOR	EXIST.	EXIST.	EXIST.	-	EXIST.	-	EXIST.	-	SF-1 / MTL. TUBE	PREFIN. / PTD-2	EXIST.	-	-

FINISH SELECTIONS SCHEDULE

TYPE	ABBR.	FINISH	SELECTION	REMARKS
FLOORING	VCT-1	VINYL COMPOSITION TILE	SEE SPECIFICATIONS	MATCH EXISTING USING ATTIC STOCK
BASE	RB-1	RUBBER BASE	SEE SPECIFICATIONS	MATCH EXISTING ROPPE 4" BASE USING ATTIC STOCK
WALL	PTD-1	TYPICAL WALL PAINT	SEE SPECIFICATIONS	MATCH EXISTING PAINT USING ATTIC STOCK
WALL	PTD-2	ACCENT WALL PAINT	SEE SPECIFICATIONS	MATCH EXISTING HM FRAME PAINT USING ATTIC STOCK
CEILING	ACT-1	ACOUSTICAL CEILING TILE	SEE SPECIFICATIONS	MATCH EXISTING ARMSTRONG TILE USING ATTIC STOCK

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SCHEDULES & TYPES

A7.1

HVAC ABBREVIATIONS

AHJ	AUTHORITY HAVING JURISDICTION
ANSI	AMERICAN NATIONAL STANDARDS INSTITUTE
ASHRAE	AMERICAN SOCIETY OF HEATING, REFRIGERATION AND AIR-CONDITIONING ENGINEERS
ASME	AMERICAN SOCIETY OF MECHANICAL ENGINEERS
CFM	CUBIC FEET PER MINUTE
DIFF	DIFFUSER
ETC	ETCETERA
EXIST	EXISTING
HORIZ	HORIZONTAL
NTS	NOT TO SCALE
SA	SUPPLY AIR
SCH	SCHEDULE
SPEC	SPECIFICATION
SQ FT	SQUARE FEET
SUP	SUPPLY
TAB	TEST, ADJUST AND BALANCE
T'STAT	THERMOSTAT
UNO	UNLESS NOTED OTHERWISE

HVAC SYMBOLS

(T)	THERMOSTAT
	CONNECTION POINT - NEW TO EXISTING
	DISCONNECTION POINT
(X)	NUMBERED NOTES
(X)	REVISION SEQUENCE
(S1) (2) / 200 AIRFLOW; (TAG) (THROWS)	GRILLE, REGISTER AND DIFFUSER TAG
	SUPPLY DIFFUSER - 4-WAY BLOW

PROJECT GENERAL NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERABLE MECHANICAL SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. CONTRACT DOCUMENT DRAWINGS FOR MECHANICAL WORK ARE DIAGRAMMATIC AND ARE INTENDED TO CONVEY SCOPE AND GENERAL ARRANGEMENT ONLY.
3. INSTALL ALL MECHANICAL EQUIPMENT AND APPURTENANCES IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS, CONTRACT DOCUMENTS AND APPLICABLE CODES AND REGULATIONS.
4. THE LOCATION OF EXISTING EQUIPMENT AND UTILITIES IS SHOWN IN AN APPROXIMATE WAY ONLY. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING UTILITIES BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PAY FOR AND REPAIR ALL DAMAGES CAUSED BY FAILURE TO EXACTLY LOCATE AND PRESERVE ANY AND ALL UNDERGROUND UTILITIES UNLESS OTHERWISE INDICATED.
5. COORDINATE CONSTRUCTION OF ALL MECHANICAL WORK WITH ARCHITECTURAL, STRUCTURAL, CIVIL, ELECTRICAL WORK, ETC., SHOWN ON OTHER CONTRACT DOCUMENT DRAWINGS.
6. ALL TESTS SHALL BE COMPLETED BEFORE ANY MECHANICAL EQUIPMENT OR PIPING INSULATION IS APPLIED.
7. TESTING, ADJUSTING, AND BALANCING AGENCY SHALL BE A MEMBER OF THE ASSOCIATED AIR BALANCE COUNCIL (AABC) OR THE NATIONAL ENVIRONMENTAL BALANCING BUREAU (NEBB). TESTING, ADJUSTING, AND BALANCING SHALL BE PERFORMED IN ACCORDANCE WITH THE AABC STANDARDS.
8. WHERE TWO OR MORE ITEMS OF THE SAME TYPE OF EQUIPMENT ARE REQUIRED, THE PRODUCT OF ONE MANUFACTURER SHALL BE USED.
9. COORDINATE ALL EQUIPMENT CONNECTIONS WITH MANUFACTURERS' CERTIFIED DRAWINGS. COORDINATE AND PROVIDE ALL DUCT AND PIPING TRANSITIONS REQUIRED FOR FINAL EQUIPMENT CONNECTIONS TO FURNISHED EQUIPMENT. FIELD VERIFY AND COORDINATE ALL DUCT AND PIPING DIMENSIONS BEFORE FABRICATION.
10. ALL CONTROL WIRE AND CONDUIT SHALL COMPLY WITH THE NATIONAL ELECTRIC CODE AND DIVISION 26 OF THE SPECIFICATION.
11. WHEN MECHANICAL WORK IS SUBCONTRACTED, IT SHALL BE THE MECHANICAL CONTRACTOR'S RESPONSIBILITY TO COORDINATE SUBCONTRACTORS AND THE ASSOCIATED CONTRACTS. WHEN DISCREPANCIES ARISE PERTAINING TO WHICH CONTRACTOR PROVIDED A PARTICULAR ITEM OF THE MECHANICAL CONTRACT OR WHICH CONTRACTOR PROVIDES FINAL CONNECTIONS FOR A PARTICULAR ITEM OF THE MECHANICAL CONTRACT, IT SHALL BE BROUGHT TO THE ATTENTION OF THE MECHANICAL CONTRACTOR, WHOSE DECISION SHALL BE FINAL.
12. THE LOCATIONS OF ALL ITEMS SHOWN ON THE DRAWINGS OR CALLED FOR IN THE SPECIFICATIONS THAT ARE NOT DEFINITELY FIXED BY DIMENSIONS ARE APPROXIMATE ONLY. THE EXACT LOCATIONS NECESSARY TO SECURE THE BEST CONDITIONS AND RESULTS MUST BE DETERMINED BY THE PROJECT SITE CONDITIONS AND SHALL HAVE THE APPROVAL OF THE ENGINEER BEFORE BEING INSTALLED. DO NOT SCALE DRAWINGS.
13. MECHANICAL EQUIPMENT, DUCTWORK, AND PIPING SHALL NOT SUPPORTED FROM A METAL DECK.
14. CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL EXISTING EQUIPMENT AND UTILITIES BEFORE COMMENCING WORK.

SHEET METAL GENERAL NOTES

1. RUNS OF FLEXIBLE DUCT SHALL NOT EXCEED 5 FEET.
2. COORDINATE DIFFUSERS, REGISTER AND GRILLE LOCATIONS WITH ARCHITECTURAL REFLECTED CEILING PLANS, LIGHTING AND OTHER CEILING ITEMS AND MAKE MINOR DUCT MODIFICATIONS TO SUIT.

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Professional Certification. I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License No:45511, Expiration Date: 06/03/2018

STATE OF MARYLAND · STEPHEN CHRISTOPHER MILLER · 45511 · PROFESSIONAL ENGINEER

FOR:

NEW SECURITY VESTIBULE RENOVATIONS FOR:
CATOCTIN HIGH SCHOOL
FREDERICK COUNTY PUBLIC SCHOOLS
14745 SABILLASVILLE ROAD
THURMONT, MARYLAND 21788

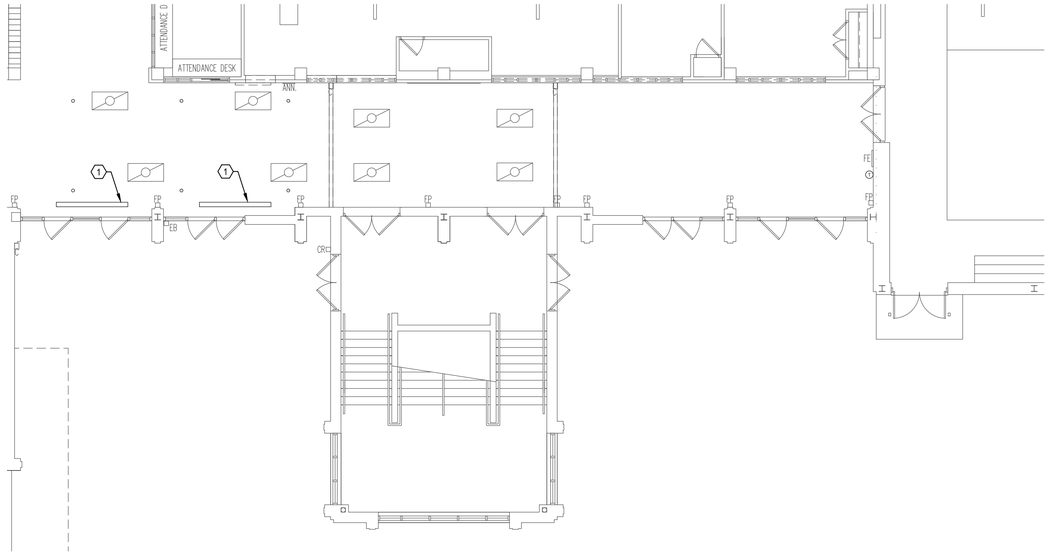
ISSUE

REV	DATE	DESCRIPTION

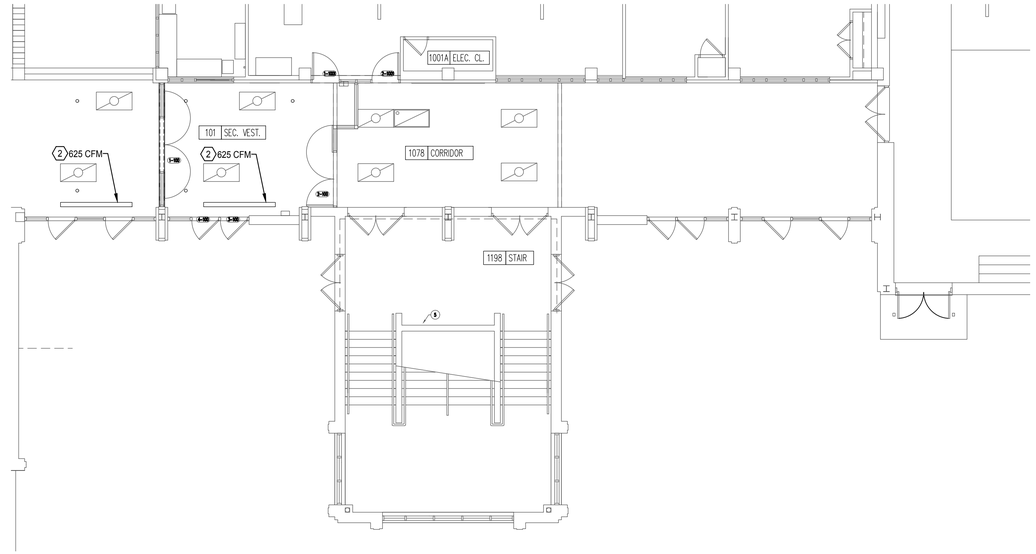
PROJECT NO.: 17-0670
DATE: 5-17-2018

SYMBOLS, ABBREVIATIONS & NOTES

M001



1 M-101 **PART FIRST FLOOR PLAN - DEMOLITION - MECHANICAL**
1/8" = 1'-0"



2 M-101 **PART FIRST FLOOR PLAN - NEW WORK - MECHANICAL**
1/8" = 1'-0"

NUMBERED NOTES:

1. PROVIDE PRE-DEMOLITION TESTING OF EXISTING SUPPLY AIR.
2. BALANCE EXISTING AIR DEVICE TO INDICATED AIRFLOW.

GENERAL NOTES:

G1: REVISE/EXTEND EXISTING WET SPRINKLER PIPE. MODIFY, RELOCATE PIPE, ADD HEADS AS NECESSARY TO ACCOMMODATE RENOVATION AS REQUIRED. PROVIDE SPRINKLER DRAWING TO FIRE MARSHAL. INSTALL PER NFPA 13 AND COORDINATE INSTALLATION WITH LOCAL FIRE MARSHAL. COORDINATE/VERIFY EXACT LIMITS OF AREA AFFECTED TO BE REVISED WITH ARCHITECTURAL DRAWINGS.

8 4 0 4 8 12 16
SCALE FEET

TRUE NORTH PLAN NORTH

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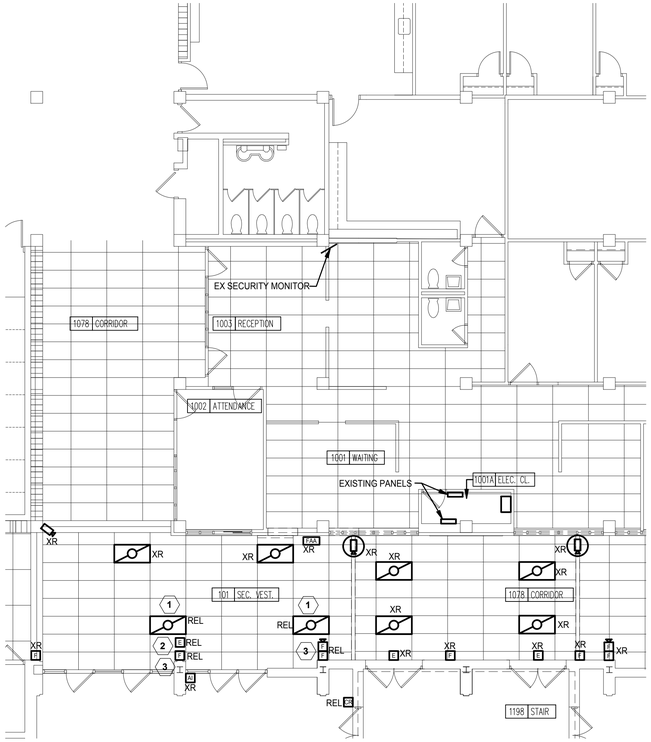
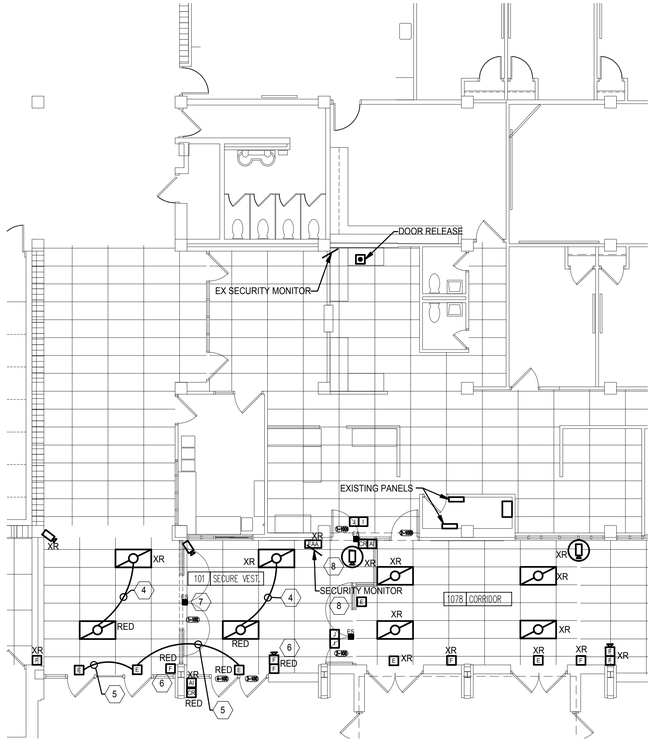
PART FIRST FLOOR PLAN - DEMOLITION AND NEW WORK

M101



1 E101 **PART FLOOR PLAN - DEMOLITION - ELECTRICAL**

1/8" = 1'-0"



2 E101 **PART FLOOR PLAN - NEW WORK - ELECTRICAL**

1/8" = 1'-0"

NUMBERED NOTES:

1. EXISTING FIXTURE SHALL BE DISCONNECTED AND REMOVED FOR RELOCATION.
2. EXISTING EXIT SIGN SHALL BE DISCONNECTED AND REMOVED FOR RELOCATION.
3. EXISTING FIRE ALARM DEVICES SHALL BE DISCONNECTED AND REMOVED FOR RELOCATION.
4. RELOCATED FIXTURE, RECONNECT TO EXISTING CIRCUIT.
5. CONNECT NEW EXIT SIGNS TO EXISTING EXIT SIGN CIRCUIT,
6. EXTEND FIRE ALARM CIRCUITS TO NEW DEVICE LOCATION.
7. DOORS SHALL BE CONTROLLED VIA DOOR RELEASE AND TIMER. COORDINATE WITH SCHOOL FOR ALL SETTINGS.
8. PROVIDE CAMERA AND MONITOR ACCORDING TO FCPS REQUIREMENTS AND CONNECT TO EXISTING SYSTEM.

PROJECT DIRECTIVE:

MAIN OFFICE
BASE BID:
PROVIDE ELECTRONIC ACCESS INTO THE MAIN OFFICE FROM THE NEW SECURITY VESTIBULE. BASE BID TO INCLUDE:

a. CARD READER ON THE NEW SECURITY VESTIBULE SIDE FOR ACCESS INTO MAIN OFFICE
b. AI PHONE ON THE NEW SECURITY VESTIBULE SIDE WIRED AND CONNECTED TO THE EXTERIOR AI PHONE FOR THE OPERATION OF DOOR RELEASE OF BOTH DOORS.

CROSS-ORRIDORS
ALTERNATE #1A:
PROVIDE ELECTRONIC HARDWARE AT EACH PAIR OF CROSS CORRIDOR DOORS FOR THE PURPOSES OF PROGRAMMING VIA THE FCPS SECURITY SYSTEM. THE LOCKING AND UNLOCKING OF DOORS TO CORRESPOND WITH THE CLASS CHANGE SCHEDULE. HARDWARE WILL INCLUDE CONCEALED ROD WITH ELECTRIC RETRACTION.

ALTERNATE #1B:
ENHANCE ALTERNATE #1A BY ADDING CARD READERS AT EACH PAIR OF CROSS CORRIDOR DOORS.

LIGHTING FIXTURE SCHEDULE

MARK	NUMBER OF LAMPS AND WATTAGE	MANUFACTURE	CATALOG NUMBER	DRIVER VOLTAGE	TYPE OF MOUNTING	REMARKS
E	LED (1.4W)	LITHONIA	LQM-S-W-3-R-120/277	UNV	SURFACE	

POWER

- EXISTING PANELBOARD
- J — JUNCTION BOX
- J — JUNCTION BOX - CEILING
- EMERGENCY POWER OFF PUSH BUTTON

SECURITY & DOOR CONTROL

- SSCP — SECURITY SYSTEM CONTROL PANEL
- SECURITY CAMERA
- SECURITY CAMERA IN BUBBLE
- CR — CARD READER
- AI — AIPHONE DOOR STATION
- PUSH-BUTTON
- DC — DOOR CONTACT
- ES — ELECTRIC STRIKE
- EML — ELECTROMAGNETIC DOOR LOCK
- ELECTROMAGNETIC DOOR HOLDER

EXISTING CONDITIONS/ DEMOLITION NOTES:

D1. CONDUITS & WIRING REQUIRED FOR THE CONTINUITY OF LIGHTING, OUTLETS, SYSTEMS AND EQUIPMENT THAT IS TO REMAIN SHALL REMAIN UNDISTURBED OR SHALL BE RECONNECTED BY THE CONTRACTOR AS REQUIRED TO MAINTAIN SERVICE. THIS WORK SHALL BE COMPLETED AT NO ADDITIONAL COST TO THE OWNER.

D2. ALL DIMENSIONS AND EXISTING CONDITIONS SHALL BE CHECKED AND VERIFIED AT THE SITE BY THE ELECTRICAL CONTRACTOR, PRIOR TO PRICING.

D3. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE REMOVED, THE EC SHALL REMOVE THE EQUIPMENT AND AND ALL ASSOCIATED WIRING AND CONDUITS BACK TO THE SERVICE POINT.

D4. WHERE EXISTING ELECTRICAL EQUIPMENT IS DESIGNATED TO BE RELOCATED, THE EC SHALL RELOCATE THE EQUIPMENT AS SHOWN ON THE PLANS AND RECONNECT THE EQUIPMENT AS REQUIRED TO MAINTAIN SERVICE. PATCH ALL OPENINGS IN THE WALL, CEILINGS, OR FLOORS CREATED BY THE DEMOLITION WORK.

D5. CONDUITS AND WIRING MADE OBSOLETE DUE TO NEW CONSTRUCTION SHALL BE REMOVED IN IT'S ENTIRETY, BACK TO THE SERVICE POINT.

D6. REFER TO ARCHITECTURAL AND MECHANICAL PLANS FOR THE LIMITS OF DEMOLITION WORK.

D7. REFER TO THE MECHANICAL DRAWINGS FOR THE EXACT LOCATIONS OF THE MECHANICAL EQUIPMENT THAT WILL BE DISCONNECTED.

LIGHTING

- LIGHTING FIXTURE - SEE FIXTURE SCHEDULE FOR MORE INFORMATION
- E — EXIT SIGN - DIRECTIONAL ARROWS AS INDICATED ON DRAWINGS

MISCELLANEOUS

- BRANCH CIRCUIT WIRING CONCEALED IN WALLS OR ABOVE CEILING
- BRANCH CIRCUIT WIRING - #10 AWG
- BRANCH CIRCUIT WIRING - UNDER FLOOR
- HOME RUN BACK TO PANEL
- LV — LOW VOLTAGE WIRING AND CONDUIT
- INDICATES CONTINUATION OF LINE

FIRE ALARM

- FACP — FIRE ALARM CONTROL PANEL
- FAA — FIRE ALARM ANNUNCIATOR PANEL
- F — FIRE ALARM PULL STATION
- F — FIRE ALARM STROBE - WALL MOUNTED
- F — FIRE ALARM HORN/STROBE - WM
- FA — FIRE ALARM AUDIBLE AND VISIBLE - CM
- F — FIRE ALARM STROBE - CM

DENOTATIONS & ABBREVIATIONS

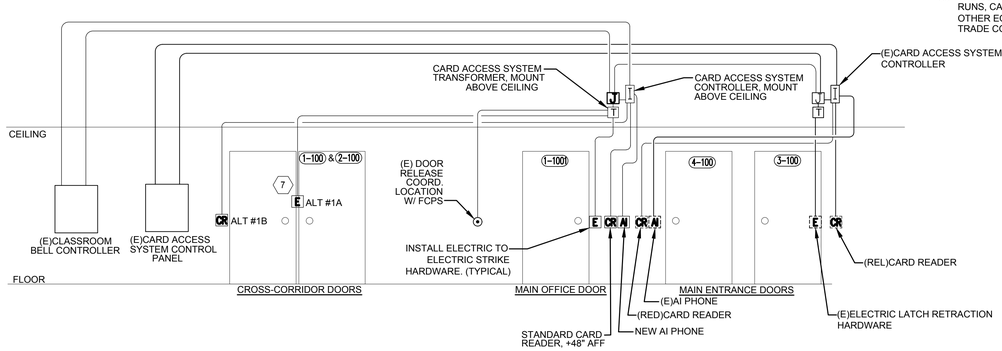
EC	ELECTRICAL CONTRACTOR
F	FIRE ALARM
GC	GENERAL CONTRACTOR
LV	LOW VOLTAGE
M	MOTOR
MC	MECHANICAL CONTRACTOR
PRN	PRESENT LOCATION/ REPLACED WITH NEW
REL	RELOCATE
RED	RELOCATED
SEC	SECURITY SYSTEM
XR	EXISTING TO REMAIN

GENERAL PROJECT NOTES:

G1. UNLESS OTHERWISE NOTED, PROVIDE ALL EQUIPMENT SHOWN ON THE PLANS. THE ELECTRICAL CONTRACTOR SHALL COORDINATE ALL SYMBOLS SHOWN ON THE PLANS WITH THE SYMBOL LIST. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE INTENT OF ANY SYMBOL THAT IS SHOWN ON THE PLANS AND NOT INDICATED ON THE SYMBOL LIST WITH ELECTRICAL ENGINEER.

G2. COORDINATE THE FINAL LOCATIONS OF ALL LIGHT FIXTURES WITH THE ARCHITECT'S REFLECTED CEILING PLANS. REPORT ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO INSTALLATION.

G3. THE CONTRACTOR SHALL COORDINATE CONDUIT RUNS, CABLE TRAY, LIGHTING FIXTURES AND OTHER EQUIPMENT LOCATIONS WITH THE OTHER TRADE CONTRACTORS TO AVOID CONFLICTS.



CARD ACCESS SYSTEM RISER

NO SCALE

8 4 0 4 8 12 16
SCALE FEET

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PART FLOOR PLAN - - DEMOLITION AND NEW WORK - ELECTRICAL

E101